

PREDICTING PATIENT ACTIVATION AND ITS EFFECT ON SECURING MEDICARE PART D
INFORMATION

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ABSTRACT

MELISSA G. BUTLER: Predicting Patient Activation and Its Effect on Securing Medicare Part D Information

(Under the direction of Dr. Michael Murray)

More and more health care decisions are being placed in the hands of patients. Patients might make the best decisions if they are motivated, knowledgeable, and have the necessary skills. Patients who are highly activated have these characteristics. In 2006, Medicare beneficiaries were given the new task of making decisions about their prescription drug coverage. This dissertation focused on the relationship between patient activation (PA) and information-seeking behavior about the Medicare Prescription Drug Program (Medicare Part D) because the examination of a relationship between PA and preparing for Medicare prescription drug coverage decisions has been limited. In addition, I examined whether modifiable factors, such as social environmental variables, predicted PA to help identify places for intervention. Lastly, I assessed whether the relationships I studied differed across racial and ethnic subgroups.

The 2004 and 2005, Medicare Current Beneficiary Surveys were used to study these relationships in Medicare beneficiaries. My conceptual framework was based on the Wilson Model for Information Behavior, the Chronic Care Model, and the Conceptual Model of How Social Networks Impact Health. I found that social environmental variables, such as patient perceptions of physicians and social support, improved PA, but community variables had no effect on PA ($n = 9,082$). Beneficiaries with higher levels of PA were more likely to seek Medicare Part D information and, therefore, were more prepared to make Medicare Part D decisions. Lastly, I found that there were

differences in these relationships across white, black, and Hispanic beneficiaries; thus, interventions should be culture specific.

Although this dissertation focused on beneficiaries, system-wide changes might improve Medicare Part D decision making irrespective of a beneficiary's level of activation. These include increasing awareness of the benefits of reviewing information about choices, disseminating information through the information channel that beneficiaries prefer to learn about Medicare, and simplifying information so that it is easier for beneficiaries to make choices.

DEDICATION

“We delight in the beauty of the butterfly, but rarely admit the changes it has gone through to achieve that beauty.” ~Maya Angelou

“Just like the butterfly, I too will awaken in my own time.” ~Deborah Chaskin

I believe the transformation of a caterpillar to a butterfly is the perfect metaphor for the time that I spent working on my Ph.D. at the UNC Eshelman School of Pharmacy. I am finally ready to fly, and so I must thank everyone who has helped in my development.

I first thank my Lord and Savior Jesus Christ for preserving me through this process. There were many bumps along the way, but He helped me through them or placed people in my life that could teach me how to proceed forward.

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"I embrace emerging experience, I participate in discovery. I am a butterfly. I am not a butterfly collector. I want the experience of the butterfly." ~William Stafford

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LIST OF ABBREVIATIONS AND ACRONYMS IN TEXT

AARP	American Association of Retired Persons
ADL	Activities of Daily Living
CCM	Chronic Care Model
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CMS	Center for Medicare and Medicaid Services
ESI	Employer-sponsored insurance
FFS	Fee-for-service
GLM	Generalized linear model
HMO	Health maintenance organization
IADL	Instrumental activities of daily living
LIS	Low-income subsidy
MCBS	Medicare Current Beneficiary Survey
Medicare Part D	Medicare Prescription Drug Program
MI	Multiple imputations
MID	Minimum important difference
MMA	Medicare Improvement and Modernization Act of 2003

MSA	Metropolitan statistical area
NMEP	National Medical Education Program
OR	Odds ratio
PA	Patient activation
PAM	Patient Activation Measure
PCC	Patient-centered communication
PCF	Physical and cognitive functioning
PDP	Prescription drug plan
RSMEA	Root Mean Square Error of Approximation
SD	Standard deviation
SE	Standard error
SES	Socioeconomic status
SEV	Social environment
SHIP	States Health Insurance Assistance Program
VIF	Variance Inflation Factor
X_2	Chi-square
ZIP	Zero-inflated Poisson
ZINB	Zero-inflated Negative Binomial

* Abbreviations and acronyms used only in tables are defined there.

CHAPTER 1: INTRODUCTION

An Overview of Medicare Part D

On January 1, 2006, Medicare began offering prescription drug coverage to its 39 million beneficiaries through Medicare Prescription Drug Program (Medicare Part D). This program was created as part of the Medicare Prescription Drug Improvement and Modernization Act of 2003 (MMA) and is the biggest expansion of Medicare since its inception in 1965. The initial 10-year cost estimates were almost \$400 billion.¹ Prescription drug coverage is not offered through a single, public, prescription drug plan (PDP); most beneficiaries or consumers had a choice of at least 40 private PDPs in 2006.² A program designed around consumer choice assumes that competition leads to higher quality and lower costs. The federal government approves PDPs that participate in the program and sets rules on the design of a standard benefit, enrollment, medications not covered, and grievance processes. The insurance companies that offer PDPs decide on the costs of their plans (eg, premiums, deductibles, and copayments) and which medications will be covered (eg, formulary, barrier processes). The complex Medicare rules, plus options from at least 40 plans, make Medicare Part D extremely complex and difficult to understand. To compound this problem many PDPs change the benefits they offer from year to year.

A consumer choice approach relies on beneficiaries making informed prescription drug coverage decisions. Having an understanding of Medicare Part D rules and options helps beneficiaries make choices that fit their needs and preferences. Thus, the Center for Medicare and Medicaid Services (CMS) supported information dissemination by increasing National Medicare Education Program (NMEP) resources and State Health Insurance Assistance Programs (SHIP) grants before the

implementation of Medicare Part D.³ However, providing information does not guarantee that beneficiaries will access it, use it, or remember it. Many beneficiaries had poor knowledge of Medicare Part D. A lack of knowledge can undermine the goals of a consumer-choice, market-oriented approach; these goals include higher quality and lower costs. Many seniors did not make informed decisions about Medicare Part D because their knowledge was poor; therefore, they were surprised when they encountered problems related to the program.⁴⁻⁶ Poor knowledge persisted into the fall of 2006, although the Medicare Part D program was almost a year old,^{5, 7} and continued towards the end of 2007.⁸

Many potential consequences and problems arose that were associated with poor knowledge. The consequences differed depending on whether a beneficiary was enrolled in Medicare Part D. Beneficiaries who enrolled faced the following problems:

1. Leaving traditional Medicare for Medicare Advantage when attempting only to gain prescription drug coverage,⁹ because they knew they had to sign up, but they did not know where¹⁰⁻¹²
2. Increased or unexpected out-of-pocket costs⁹
3. Limited access to prescribed medications⁹
4. Increased cost-related noncompliance¹³

Although Medicare Part D was designed to give beneficiaries choice in prices and benefits, very few seniors knew how many PDPs from which they could choose or that there were differences among the PDPs.^{2, 11, 14} It is possible that so few seniors understood the plan attributes and how the attributes differed among the PDPs because they reviewed less than a handful of plans and selected a PDP based on familiarity with the insurance company offering the plan.^{6, 7, 9, 12, 15-17} PDP attributes, such as premiums and formularies, change from year to year; therefore, not knowing that plan switching is allowed could result in beneficiaries facing higher costs than necessary, along with limited access to medications in future enrollment periods.

The problems experienced by beneficiaries who did not enroll included the loss of the projected 23%–84% savings on prescription medications and late enrollment penalties.¹⁸ Beneficiaries were expected to save up to 83% on prescription drug costs if they enrolled in the low-income subsidy (LIS) program,¹⁸ yet knowledge of the LIS program was poor and enrollment into the program was lower than expected.^{7, 11-13, 15, 19-21} In addition, seniors lacked an awareness of the deadline for enrollment and the late enrollment penalty.^{12, 15, 20, 21} Each month that the beneficiaries were not enrolled and were without credible coverage (actuarially equivalent to the standard benefit), they accrued a 1% penalty against future premiums.¹

It is highly probable that the consequences of poor knowledge were more pronounced for vulnerable beneficiaries (eg, racial minorities, those with low incomes, the frail elderly, and the cognitively impaired) because they had the most to gain from Medicare Part D.^{9, 22} Seniors with the lowest incomes were less aware of the LIS program^{11, 13, 21} and poorly understood plan switching.^{22, 23} Their ignorance of these options persisted almost a year into the program.⁵ These statistics are particularly troubling because dually eligible beneficiaries, those with both Medicare and Medicaid coverage, were allowed to switch plans on a monthly basis. If dually eligible beneficiaries were auto-enrolled into plans that did not cover their medications, being unaware of the opportunity to switch plans on a monthly basis would have meant that they had to change their medications to fit their plan's formulary, pay higher prescription drug bills, or go without their medications.

Medicare Part D Information-Seeking Experiences

Because the Medicare Part D is new, complex, and evolving, having an understanding of the drug benefit and any changes that might occur could help beneficiaries better navigate the system. If beneficiaries are well informed about the rules of Medicare Part D and if they understand the differences between the PDPs that provide coverage, they will be in a much better position to make good decisions about prescription drug coverage, that is, decisions that fit their needs and preferences.

Consequently, they will be much less susceptible to disappointment and confusion regarding their coverage and will be less vulnerable to questionable insurance sales appeals and methods. These issues are of an even greater importance in vulnerable subgroups (eg, racial/ethnic minorities, those with low incomes, the frail elderly, and the cognitively impaired) that often have fixed incomes and can ill afford unexpected and excessive costs in medication that might result from poor coverage decisions. By increasing the number of informed beneficiaries, CMS is more likely to meet the quality and cost objectives of a consumer choice, market-oriented program like Medicare Part D.

However, one cannot expect beneficiaries to be knowledgeable about Medicare Part D if they do not seek information or cannot find useful information. Beneficiaries had two, starkly different experiences in seeking information about Medicare Part D. Some beneficiaries used multiple information sources or information sources that were new to them when trusted and preferred information sources were not available or knowledgeable enough about Medicare Part D; this helped them make decisions.^{16, 24} However, other beneficiaries did not take these steps and reported the following results:

1. Not having enough information about Medicare Part D to know how it would affect them personally¹⁵
2. Not understanding the benefit¹⁵
3. Not seeking clarification of the benefit from another source when needed⁵

Access to information and the inability to find information that matched their preferences contributed to the inability of vulnerable beneficiaries to make informed Medicare decisions in the past;²⁵ Medicare Part D decision making was no different. On many occasions, low-income beneficiaries reported that they did not know where to find information.^{22, 23, 26} In addition, members of vulnerable subgroups experienced additional barriers to information seeking that were not reported in the general population (eg, physical, language, and transportation barriers).²³ The rules for dually

eligible beneficiaries differed from the general population; therefore, some dually eligible beneficiaries found that coordinators of community talks often did not know the answers to their questions.²³ Several dually eligible beneficiaries were encouraged to wait for auto-enrollment rather than try to figure out how to make decisions.²³ Others waited for auto-enrollment, even if they wanted to look for information, because they lacked the confidence to find the information to make a good decision.²⁶ Yet another group did not think it was necessary to look for information because they could be auto-enrolled.²⁶ The plight of dually eligible beneficiaries is relevant to this discussion because greater proportions of ethnic minorities received Medicare Part D benefits because of their dual eligibility status compared to white beneficiaries.¹³

Even if seniors had access to information, some seniors reported that the information was too complicated for them to grasp;¹⁶ therefore, they came away confused, frustrated, and discouraged. Some beneficiaries reported that they would not reassess information about Medicare Part D during the 2007 and 2008 enrollment periods because of poor experiences in 2006.^{5, 8} Other beneficiaries would only consider switching plans in 2007 if they had access to an informed person who would help them understand material on Medicare Part D;⁵ these beneficiaries were not confident in their ability to sift through the information by themselves. Unfortunately, seniors were still afraid of making decisions during the 2010 enrollment period. The Medicare Part D program changes annually; therefore, it is important that beneficiaries remain engaged in the process of informing themselves, not only for their benefit, but also for the benefit of the Medicare Part D program because uninformed decisions or the lack of a decision undermines the solvency of this program.

Patient Activation

Consumer choice policies, like Medicare Part D, are based on the assumption that consumers will proactively manage their health care, especially when it pertains to out-of-pocket costs. However, as seen by vastly different Medicare Part D information-seeking experiences, cost sensitivity does not

guarantee that consumers will engage. Therefore, disseminators and managers of Medicare information such as CMS and other stakeholders must be able to recognize when effective choice in information is constrained and to respond with appropriate interventions. The acquisition and evaluation of information depends on a person's level of motivation, interest, and awareness;²⁷ therefore, in this dissertation, I will assess whether patient activation (PA) is a driver of information seeking that is, in turn, related to Medicare Part D using Medicare Current Beneficiary Survey (MCBS) data. PA has been defined as the "confidence, skills, knowledge, and motivation to manage one's health and health care."²⁸ I will use the 2004 and 2005 MCBSs that were administered by CMS between 2004–2005 and 2005–2006 to study this relationship because (1) it is nationally representative of Medicare beneficiaries living in the United States and its territories; and (2) it contains the 15-item, Medicare PA instrument. Differences in PA might help explain the two extremely different information-seeking experiences of the Medicare beneficiaries (reported above) who used more than one source or new sources compared to the beneficiaries who did not have enough information and did not seek clarification about the benefit when needed. Understanding the effect of PA on information-seeking behavior might be one of the first steps in developing interventions that might improve information-seeking behavior because PA might be improved.^{29, 30} If a relationship exists, future interventions developed by CMS and other stakeholders could focus on improving information seeking by increasing activation.

Understanding factors that contribute to high PA will help in designing these interventions. To develop interventions that change PA, some of its antecedents must be identified and understood. Currently, we know that low PA is associated with increasing age,^{28, 31, 32} belonging to a racial/ethnic minority group,³¹⁻³⁴ and low socioeconomic status (SES).^{28, 31, 32, 34, 35} The most vulnerable in our society have the lowest levels of activation. These characteristics are not changeable; however, they might help us identify whom to target. Thus, in this dissertation, I will also explore whether social–

environmental variables predict the level of PA. Past studies have shown that physician support and trust increase activation.^{33, 36-38} However, the primary relationship of interest in this dissertation is not dependent on a physician encounter; therefore, I will also explore microsocial–environmental and macrosocial–environmental variables that might support a high level of PA such as interpersonal and community social support. Identifying antecedents of PA could improve interventions designed to increase information seeking and the other health behaviors and outcomes affected by PA.

There are differences in PA between racial/ethnic subgroups³¹⁻³⁴ and differences in Medicare Part D information-seeking experiences between racial/ethnic subgroups.^{39, 40} In this dissertation, I will explore why these differences exist. If differences are found in the relationships between the social environment and PA and between PA and information seeking, and these across racial/ethnic subgroups, future interventions might also need to be subgroup-specific.

This dissertation makes several contributions to the literature, for I will be the first to study social–environmental antecedents of PA in a majority elderly population and the first to assess antecedents of PA measured by the Medicare PA instrument. Although one study assessed the differences in the effect of determinants of PA between blacks and whites; I will also be the first to study determinants of PA in a Hispanic population, for Hispanics were excluded from previous studies.³³ I will also be the first to study various types of Medicare Part D information-seeking behaviors. No researcher has yet studied the difference between Medicare Part D information seekers and nonseekers, there is little evidence on the number of information sources that beneficiaries use to satisfy their information needs,^{16, 23} and information channels have not been studied with regard to Medicare Part D information seeking. We know only the type of information source that the beneficiaries used. Studies assessing the type of sources used did make racial comparisons;^{39, 40} however, they suffered from the limitations of grouping all minority survey respondents together⁴⁰ or from excluding Hispanics.³⁹ In this dissertation, in my assessment of various types of information-

seeking behavior, I differentiate between blacks and whites, and include Hispanics. As a whole, the Hispanic population's Medicare Part D information-seeking experience was not documented. In addition, in this dissertation, I will be the first to assess how PA relates to each information-seeking behavior. No study has yet examined the differences in the effects of the determinants of Medicare Part D, information seeking among racial/ethnic groups.

Using a nationally representative survey is a new contribution to the literature because past, population-level studies that measured PA and information-seeking¹² and social–environmental variables and PA^{33, 38} excluded dually eligible beneficiaries, the sickest and poorest beneficiaries who were also more likely to be minorities. Another benefit of using this data source is to avoid simultaneity bias, which is a limitation of past studies that measured the relationship between PA and outcomes, for the variables were measured at the same time.^{12, 41, 42} It has been difficult to determine whether the outcome caused PA or whether PA caused the outcome. In the MCBS, PA was measured prior to the time that beneficiaries started to actively seek information;¹¹ therefore, I avoid simultaneity bias.

Specific Aims

Aim 1: To Examine the Association between Social–Environmental Factors (Patient Perception of Physician, Social Support, and Community) and PA

I am studying PA with respect to information seeking because it is a mutable variable. However, to determine how to develop the interventions that change PA, one must understand the antecedents of PA. An assessment of the antecedents of PA is likely to enhance the understanding of factors that act as barriers to PA or facilitators of PA. Although PA varies by sociodemographics,^{28, 31-35} little is known about other antecedents. I will focus on social–environmental antecedents because people who exhibit proactive health behaviors tend to have supportive home, health care, and work environments, and are more activated.⁴³ The social–environmental variables under study include 7 variables of patient perception regarding physicians (eg, competence, confidence, concern, hurried

care, lack of compassion, thoroughness, contextual knowledge); 4 variables regarding social support (marital status, number of living children, whether the patient lives alone, and whether the patient has a helper to go to the doctor [a helper assists the patient in the actual visit, provides moral support, or provides transportation]); and 3 variables regarding community (whether the patient lives in a community housing, metropolitan statistical area (MSA).

Aim 2: To Examine the Association between PA and Information-seeking Behavior of Medicare Beneficiaries Considering Medicare Part D Enrollment

Aim 2 will provide a comprehensive understanding of information-seeking behavior by identifying the following factors:

1. Beneficiaries who did and did not seek information
2. The number of sources of information beneficiaries used
3. Whether beneficiaries used preferred and nonpreferred information channels (ie, the medium through which a message reaches an individual such as writing, the Internet, interpersonal communication, or the media)

Several information sources might exist within each channel. For example, doctors, pharmacists, family members, and friends are individual information sources who use an interpersonal information channel. Individuals usually have preferences for the channel on which they like to receive information.⁴⁴ These information-seeking behaviors are examples of active searching. Active searching occurs when individuals intentionally attempt to find information.²⁷

Past studies of Medicare Part D information seeking have been limited to the type of information source used.^{7, 10, 12, 14, 39, 40} However, the understanding of beneficiary information-seeking behavior is limited when it is focused merely on a subset of available information sources or one information channel (ie, the Internet), for information-seeking behavior is more than merely the choice of an information source.⁴⁵ If beneficiaries should decide to seek information, they must also determine

how much time and effort to use, how many sources to use, and whether to use nonpreferred information channels. Understanding the relationship between PA and information-seeking behavior during the first year of the program is important because understanding this relationship helps lay the groundwork for understanding information-seeking behavior in subsequent enrollment periods. This first period is also important because it mirrors the decision making of new cohorts of beneficiaries who will be making decisions about Medicare Part D for the first time as they become eligible for Medicare each year. In addition, if the plan attributes continue to change from year to year and Medicare Part D is not simplified, beneficiaries will require greater skills and motivation to sift through large amounts of information and yet prevent overload. Therefore, the exploration of the relationship among PA, the decision to seeking information, the number of information sources, and the use of nonpreferred information channels is important.

Aim 3: To Determine Whether the Associations among Social–Environmental Factors, PA, and Information Seeking Vary by Racial/Ethnic Subgroups

In this aim, I will explore why racial/ethnic differences in PA and information-seeking behavior exist.^{23, 25, 31-34} Examining both differences in the composition and effects of independent variables across racial/ethnic subgroups could be important in explaining why differences in outcomes like PA and information-seeking behavior exist across subgroups. Analyses run on the entire sample in Aims 1 and 2 will yield average effects; however, the average effect might mask racial/ethnic subgroup differences in the relationships between independent and dependent variables. To uncover whether the relationships among social–environmental variables, PA, and information seeking vary by race/ethnicity, I will conduct stratified analyses. Stratification by race in some studies has revealed opposing relationships between independent and dependent variables among the races,^{46, 47} relationships that are weaker in one group than another,^{33, 47, 48} or relationships that are significant in one group, but not another.⁴⁶⁻⁴⁸ If there are differences in associations across subgroups, interventions

that are not tailored to subgroup might fail.

Significance

Because the economy has contracted and health care reform looms, discussion has centered on reducing Medicare costs by reducing reimbursement rates and waste. Previous research has shown that activated patients have better health outcomes and lower expenditures. If we find ways to improve activation by learning about its antecedents, CMS could benefit through lower expenditures. Through the study of social-environmental variables, I can uncover where to target interventions and who should be the target of these interventions. These interventions might need to have a multilevel approach, that is, one that includes all stakeholders such as beneficiaries, friends and family, physicians and the health care system, community organizations, PDPs, states, and the federal government. If I find that physicians are critical in the development of PA, improving their relationships with patients will be important. As more physician groups and organizations develop practices based on the Chronic Care Model (CCM),⁴⁹ understanding how physician behaviors affect activation becomes even more relevant. If social networks and support are relevant to PA, interventions targeting the support system might also be necessary. Through this research, family and friends might gain insight into whether they help or hinder the development of activated beneficiaries. Lastly, identifying the types of communities that support or act as barriers to PA could lead to community level intervention.

Understanding the predictors of Medicare Part D information seeking will be critical in developing interventions aimed at increasing the number of informed beneficiaries. Informed beneficiaries are needed for the Medicare program to remain solvent. If beneficiaries were to improve their information-seeking behaviors, they might be less likely to experience stress that is related to finding ways to meeting their prescription drug costs because they would be more likely to make better coverage decisions. Improving activation might not only help increase positive health behaviors and outcomes, but also increase information seeking related to Medicare Part D. CMS can use the results

of this study to learn how and why information about Medicare Part D was or was not sought. It can take the lead in improving the information dissemination process through the NMEP and SHIP.

Identifying ways of improving information seeking provides hope to family and friends who have carried the burden of helping beneficiaries with Medicare Part D decisions, because activated beneficiaries tend to be more independent decision makers and make better decisions. Focusing on activation and independence might be even more relevant to adults who care for both of their parents and children. Physicians might welcome improving the information-seeking skills of beneficiaries because Medicare Part D decision making could be addressed outside of patient visits. If discussions about Medicare Part D do take place in informed beneficiaries' visits, the visits might be more productive. For example, activated patients might be more likely to discuss the need to change a medication to fit a plan's formulary or to fill out a needy medication request if the doctor wants the patient to remain on a nonformulary medication, whereas uninformed, inactivated patients would ask for help in selecting a plan.

Payers might also benefit from this study's results because informed beneficiaries usually make more cost-efficient decisions that benefit both the payer and beneficiary. PDP might meet the objectives of medication therapy management more easily because activated patients tend to be more proactive in their care. Eventually, quality indicators will be assigned to PDPs; it is likely that an activated and informed population of beneficiaries will help improve quality scores. The Medicaid population tends to have greater health problems and is even more vulnerable to adverse health outcomes when they do not have access to needed medications. States might be interested in improving information seeking among beneficiaries because states pay some of the health care costs associated with adverse outcomes. Avoiding unnecessary health costs becomes more relevant as claw backs and phased-down State contributions increase, and state budgets get smaller due to the slowed economy.

Lastly, this research will help further the fight against racial/ethnic health disparities because not only will we learn whether differences exist between PA and information seeking, but we might also learn whether the antecedents of PA and information seeking differ. If differences are found, we will have further insight into how interventions must be designed. For example, if I find that blacks are less likely to report that their physician shows compassion and if compassion adversely affects PA, but there is no relationship between these variables in whites, physician groups will need to improve thiopinion among their black patients to improve PA.

CHAPTER 2: LITERATURE REVIEW

Patient Activation

PA is central to this dissertation because I explore its antecedents and how it might help explain the variation in Medicare Part D information-seeking behavior. However, before one can explore the antecedents, it is necessary to understand the concept of PA and its development. The notion of an activated patient has been discussed for nearly 40 years.⁵⁰ The activated patient model encouraged patients to participate in their care so that they would develop a commitment to treatment plans and confidence in them. Over the years, PA has been viewed in many ways, and interest in it has waxed and waned. However, a resurgence of interest in PA has occurred since the recent development of standardized instruments. The history of PA is also described.

PA has been defined broadly and narrowly. One of the first definitions given in 1970 was the broadest. Wilson stated,

Activated patients are persons whose clinical skills and understanding of health are upgraded in order that they can become more active participants in their own care rather than assume the passive role traditionally assigned to them by health care professionals.⁵¹

Drawing on this definition, Sehnert felt activated patients would

accept more individual responsibility for their own care and that of their families; learn skills of observation, description, and handling of common illnesses, injuries, and emergencies; increase their basic knowledge about health with an emphasis on wellness; and learn how to make appropriate and economical use of health care resources, personnel, services, insurance, and medicine.⁵¹

During the later part of the 1970s and 1980s, the understanding of PA was narrower in scope than described above and sometimes it was defined as a single action. These actions included self-care, self-management, question asking, patient participation, patient–provider communication, patient information seeking, and patient decision making. Green viewed activated patients as assertive because they were audacious enough to question their physician.⁵² Morisky considered patients activated when they had an increased feeling of personal control over events and occurrences related to managing medical regimens.⁵³ In Morisky’s eyes, patients would do what was necessary to be compliant with regimens because they knew about their disease, the risks associated with uncontrolled disease, and the benefits of treatment. Steele’s definition of PA revisited the concept of passivity because “activated patients reject the passivity of sick role behavior and assume responsibility for their own care.”³⁷ As a result of being activated, patients would “ask questions, seek explanations, state preferences, offer opinions, and expect to be heard.”³⁷ The benefits associated with activation were knowledge, satisfaction, and commitment to medical regimens. Despite the differences in definitions, taking ownership or control of one’s health was a common theme in each definition.

In the 1990s, there was an absence of literature under the name of PA. By the 21st century, Hibbard’s operationalization of PA almost came back full circle to the work that Sehnert presented 30 years earlier, although she never cited his work. She focused not only on the physician encounter or self-management, but also on health-related decision making outside of the physician encounter. She expanded the focus because health care is consumer-driven and patients are playing a greater role in managing health care financing and payments. Hibbard defines PA as “the knowledge, beliefs, and skills needed to manage one’s health and health care.”⁵⁴ Activated patients

“believe patients have important roles to play in self-managing care, collaborating with providers, and maintaining their health; they know how to manage their condition and maintain functioning and prevent health declines; and they have the skills and behavioral repertoire to

manage their condition, collaborate with providers, maintain their health functioning, and access appropriate and high quality care.”

Hibbard further conceptualizes PA as a capacity-building process because there are several stages of PA, and patients progress through each stage before becoming fully activated.²⁸ These stages include “believes an active role is important, confidence and knowledge to take action, taking action, and staying the course under stress.” Hibbard proposes that interventions should be tailored to the patients’ level of activation. This view is similar to Steele’s view that a single activation intervention is not appropriate for all patients.³⁷ Hibbard created an instrument, the Patient Activation Measure (PAM), which includes items that measure the determinants that Steele felt were important in understanding PA (eg, locus of control, self-efficacy of self-management behaviors, and readiness to change behaviors).^{37, 54} Hibbard also believed that this nonspecific instrument could be used to compare efficacy of interventions and health care systems.

CMS has also had an interest in assessing PA, especially because Medicare beneficiaries have many choices of providers, health insurance, and prescription drug coverage. This interest led to the creation of a Medicare PA instrument that currently has 15 items (Table 3).³² The developers never defined PA; however, “actions consumers were willing to take for patient safety and what roles they felt comfortable talking with their health care providers” guided the instrument’s development. The Medicare PA instrument has five domains: (1) self-care self-efficacy, (2) doctor relationship and communication, (3) assertiveness with doctor, (4) active and shared decision making, and (5) health information seeking. Cronbach’s alphas for each domain were 0.72, 0.73, 0.55, 0.51, and 0.69, respectively.³² Some of the concepts within this instrument are in keeping with Steele’s recommendation because self-efficacy is assessed; however, it also follows the tradition of how PA was measured in the 1980s for some domains represent actions. The dissertation uses the Medicare PA instrument.

CMS is currently using this instrument to segment patients so that outreach and education activities can be targeted to the different segments with the hope of promoting better decision making.³² A cluster analysis was conducted to categorize patients into cluster groups. The clusters were labeled Active (30% of the population), Passive (17%), High Effort (26%), and Complacent (27%). Beneficiaries classified as active scored highest on all five domains of the Medicare PA instrument, while passive beneficiaries scored lowest on all domains, except shared decision making.³² The complacent group scored lowest on the shared decision-making domain. High effort seniors had a greater likelihood of sharing decisions and seeking information, but were less likely to have self-efficacy, good doctor relationships, or assertiveness. The opposite was true with the complacent group. Williams and colleagues used this instrument only to categorize patients who had similar levels of activation and did not intend to change activation.

Outcomes Associated with Patient Activation

The motivation for studying PA, in relation to Medicare information seeking, stems from the numerous health outcomes and behaviors with which it is associated. Patient activation has often been studied in relation to self-management behaviors, knowledge, decision making, health care use, satisfaction with care, and medication compliance.^{36, 50, 53, 55, 56} More recently, many of the same outcomes have been studied with standardized instruments measuring PA.^{12, 28, 41} Studies using standardized instruments found PA to be positively associated with health status, health-related quality of life (SF-8 and WHOQOL-BREF), use of one or more self-management services, comprehension of quality information and making informed decisions about hospitals after they were given the information on their quality and costs.^{32, 34, 35, 41}

In keeping with the definitions of PA that focus on use and prevention, a positive association between these outcomes and PA is observed. Active and high effort beneficiaries, identified by the Medicare PA instrument, received preventative care, flu shots, and pneumonia vaccinations more often

than passive and complacent patients, possibly because they were more motivated.³² The complacent patients were less likely to have hospitalizations and office visits compared to the other clusters.³² High effort beneficiaries used the most medication while complacent beneficiaries used the least.⁴²

Patient Activation and Medicare

There is some evidence of associations between PA and Medicare variables that are similar to those studied in this dissertation. Patient activation and information-seeking results were mixed. Active patients used the Internet, had visited the Medicare Web site, and had called the Medicare 1-800 number more than other patients.³² In addition, the clusters had different information channel preferences. Active beneficiaries had the greatest preference for Medicare publications and the Internet compared to other clusters. The passive group preferred talking to someone about Medicare. However, when PA was measured by the PAM, PA was not associated with seeking help with past Medicare decisions, seeking or having sought help for Medicare Part D decisions, or having compared PDPs.¹²

Patient activation and knowledge about Medicare (prescription drug program knowledge, fee-for-service (FFS) knowledge, and Medicare Advantage knowledge) have also been studied.¹² Knowledge was lowest for patients with low PA. Similarly, knowledge (measured and perceived) about Medicare was highest amongst active patients.³² Active patients were more likely to feel that Medicare was understandable. Active and high effort focus group participants were more knowledgeable about Medicare Part D.⁴² Decisions also differed by level of activation. Confidence in Medicare decision-making was lowest for patients with low PA.¹² Active patients were more ready to make informed decisions about Medicare.³² However, when it came time for making actual decisions, complacent beneficiaries made their own decisions at the same rate as active beneficiaries, possibly because they had similar skill levels. Medicare Part D enrollment was highest in active and high effort focus group participants. They also had less difficulty choosing a PDP than other cluster groups. Interventions and education programs that are specific to level of PA seem appropriate because of the differences in

behaviors and preferences related to Medicare. Therefore, I believe PA will predict Medicare Part D information seeking.

Patient Activation as a Target of Interventions

Hibbard believes the PAM can be used to assess a patient's level of activation, tailor interventions to activation level, and assess changes in activation in many different situations.^{28, 54} A good portion of research related to the PAM focuses on increasing a patient's level of activation to improve self-management behaviors.²⁸ Tailoring interventions to a person's stage of PA separates this research from that of the past.⁵⁷ Hibbard proposed a step-based approach for designing interventions. With this approach, patients are given self-management goals typical of people who are one stage above their activation stage because aiming for the desired endpoints typical of people at the highest stage of activation might be too overwhelming for patients with minimal knowledge and skills. Eventually these patients are expected to progress to behaviors exhibited by patients in the highest stage of activation.⁵⁷ Recent studies show that this approach is working at improving both PA and health outcomes.³⁰

Support within one's environment and even from one's physician might be particularly important in improving activation among racial/ethnic subgroups that tend to have the lowest levels of activation. Improving activation might be an avenue to closing some racial/ethnic health and information-seeking disparities. Other researchers also feel PA is a reasonable target for reducing health disparities as seen in recently published articles.^{31, 58-60} Kalauokalani has considered PA as a way of reducing racial disparities in pain management.⁵⁹ Alegria successfully improved compliance with treatment and seeking care among a largely minority sample of mental health patients by increasing PA through teaching patients how to ask questions to get informative information and to help identify their roles in the decision making process.⁵⁸ Cortes studied how PA, that was measured by question asking, affected patient-provider communication among Latino mental health patients.⁶⁰ Hibbard found

that closing the gap in PA scores between black and white patients reduced disparities in health outcomes.³³

CHAPTER 3: CONCEPTUAL MODEL

Figure 1 shows the conceptual model that links social-environmental factors to PA and PA to active information-seeking behavior. The model, which is based on the Conceptual Model of How Social Networks Impact Health,⁶¹ the CCM,⁴⁹ and Wilson's Model of Information Behavior,²⁷ suggests that social-environmental variables such as patients' perceptions of physicians, social support, and community variables have a direct effect on PA (eg, self-care self-efficacy, physician communication, assertiveness, shared decision making, and health information seeking). In addition, I posit that PA is an activating mechanism (of which Wilson speaks) that positively affects the decision to seek and how one seeks in spite of barriers to information seeking. The focus of this dissertation is on the concepts in the bold boxes in Figure 1, which are social–environmental variables, PA, the decision to seek information, and information-seeking behavior. I will not study information use or information processing as shown by the dotted lines in Figure 1. In the following sections, I describe how each of these concepts is related to one another.

The Social Environment as an Antecedent of Patient Activation

Before one can answer the question, “Does the social environment impact PA?” one must define social environment.

Human social environments encompass the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. Components of the social environment include built infrastructure; industrial and occupational structure; labor markets; social and economic processes; wealth; social, human, and health services; power relations; government; race relations; social inequality; cultural practices; the

arts; religious institutions and practices; and beliefs about place and community. Embedded within contemporary social environments are historical social and power relations that have become institutionalized over time. Social environments can be experienced at multiple scales, often simultaneously, including households, kin networks, neighborhoods, towns and cities, and regions.⁶¹

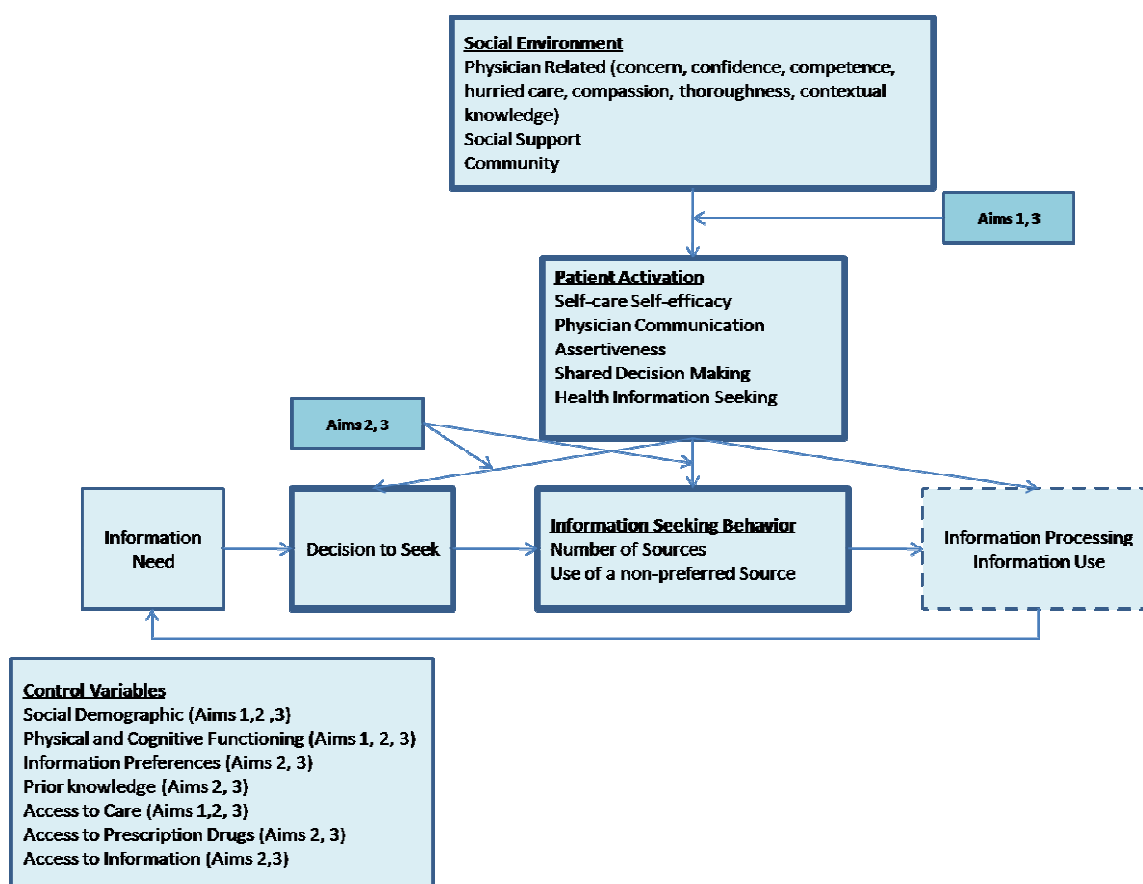


Figure 1. Conceptual framework for information-seeking behavior.

I conceptualized that multiple levels (eg, macrolevels, mezzolevels, or microlevels) of the social environment can affect PA. At the macrolevel, the community (eg, urbanicity) can influence PA. At the mezzolevel, the extent to which a person has social support or at least a network that can provide support can influence PA. At a microlevel, the relationship with one's physician and community housing can influence PA. Support for the plausibility of these relationships comes from the Conceptual

Model of How Social Networks Impact Health⁶¹ and the CCM.⁴⁹ In the Social Networks Model in Appendix A, social-cultural structures such as culture, social economic factors, politics, and social change create the conditions under which social networks are shaped. It further posits that social networks provide opportunities for psychosocial mechanisms to affect health through health behavior pathways, psychological pathways, and physiological pathways. Self-efficacy, a domain of PA, is one of the psychological pathways.

The CCM in Appendix A posits that informed, activated patients are a product of a prepared, proactive, health care team or physician, health system, and community; it also posits that productive interactions between all components result in improved clinical, functional, satisfaction, and cost-related outcomes.⁴⁹ Through clinical and community support, patients are encouraged to make decisions actively, to engage in behaviors that control symptoms and prevent complications, and to manage their treatment, particularly with regard to chronic diseases. The health system promotes activated patients directly through self-management support and indirectly through providers using an organized, delivery-system design; decision support; and clinical information systems. The health system falls within the broader community and, thereby, might influence PA through self-management support, resources, and policies.

Community Social-Environmental Variables

In this dissertation, I study two community variables: urbanicity (as measured by MSA) and living in community housing. In both the Social Networks Model and CCMs, community variables influence PA by creating access to resources and material goods. They differ in that the Social Network Model speaks to a relationship between the social environment and self-efficacy, while the CCM specifically addresses a relationship between the community and activation. In addition, the scope is wider because the Social Network Model views housing as a means to provide access to resources.

Unfortunately, very few researchers have studied the relationship between urbanicity and PA

or its domains. Neighborhood of residence has been shown to influence economic self-efficacy.⁶² However, physician communication does not vary by MSA.⁶³ Although geography can affect the resources available for information seeking,²⁷ Czaja found no difference in information seeking between urban and rural cancer patients.⁶⁴ I found no studies measuring the effect of urbanicity on assertiveness or shared decision making. Unless we are able to measure the possible resources in these communities, it might be difficult to predict how community variables will affect PA and its domains. Therefore, I predict a relationship between MSA and PA, and its domains exist, but I do not predict the direction of this relationship. No studies have measured the effect of living in community housing on any of the PA domains. Therefore, as with MSA, I hypothesize that relationship with PA exists, but I stop at the point of indicating the direction of this relationship.

Social Support, Social–Environmental Variables

Four social support variables are studied in this dissertation: marital status, number of living children, living alone, and taking a helper to the doctor. The Social Network Model is predicated on social networks and support, where marital status, number of living children, and living alone are classed as social networks while having a helper is an example of instrument social support. Relationships between the network variables and PA could be weaker than instrumental, social support variables because they are more distal to PA or health outcomes. In addition, support might not be realized from people in their network.

Until now, only two studies have analyzed social-support antecedents of PA with standardized instruments.^{33, 38} Positive associations were observed between supportive work and social climates and PA.³³ The PAM and the Medicare PA instrument are correlated; therefore, it is fair to assume that relationships observed between social–environmental variables and the PA measured by the PAM will exist with the Medicare instrument. Despite limited data showing that social support predicts PA, several studies show that social support predicts the individual PA domains. To strengthen the

argument for this relationship with PA, I review below studies that show a relationship between the individual PA domains and social support.

Bandura shows that self-efficacy is influenced by vicarious experiences and verbal persuasion.⁶⁵ For example, beneficiaries might watch family members or friends model the behavior they want to change or they might be encouraged by family members to change their behaviors. Blustein found that individuals who were married had higher levels of self-efficacy.⁶⁶ Other studies have found that, social support increases asthma-related self-efficacy⁶⁷ and exercise self-efficacy in elderly patients with arthritis.⁶⁸ Social strain on the other hand lowered self-efficacy.⁶⁸

Epstein offered a conceptual framework for studying patient-provider communication.⁶⁹ He posits that family affects physician communication. Lebreque found this to be true in cancer patients; more communication occurred when family members were present at the visit.⁷⁰ Oddly, studies do not show a relationship between physician communication and marital status.^{63, 71} Social support and networks have mixed effects on shared decision making. Patients with more social support were more likely to be active participants in their care.⁷² Patients who felt their physician's office provided good support services were less assertive.⁷³ Although the helpers can serve as conduits of the shared decision making process, family members can be barriers if they override the shared decision-making process.⁷⁴ Greene found that shared decision making occurred less often when companions were present at older patients' visits.⁷⁵ Single patients had greater preference for participation in their care.^{72, 76}

Similar to shared decision-making, studies that examined the role of social support and networks on information seeking were mixed. Information seeking is influenced by the behavior of friends and family members;⁷⁷ these behaviors can serve to increase or decrease information seeking. Social support increased the likelihood of information seeking among cancer patients.⁶⁴ Dutta-Bergman found that interpersonal communications and networks increased the likelihood of autonomous health

information seeking.⁷⁸ In one study, having a helper at the visit did not contribute to information seeking.⁶⁴ Lastly, marital status was not associated with either preference for information seeking or autonomous information seeking.^{64, 76}

Overall, the social support variables appear to have a positive effect on PA domains; therefore, I hypothesize that these variables will increase PA. The exception is physician communication. Taking a visitor to a visit will be positively related to physician communication.

Patient-Perception-of-Physician, Social-Environmental Variables

The CCM posits that productive relationships between physicians and patients promote activation. Until now, we only knew that there was variance in PA across physicians' patient panels. This variance might be due to differences in trust;³⁸ when patients trust their physicians, they have higher PA.^{33, 38} Physician trust is highly correlated with patient perceptions of physicians.⁷⁹ Therefore, I studied 7 patient-perception-of-physician variables in this dissertation. They include physician shows concern and compassion, patient has confidence in the physician, patient believes the physician is competent, physician provides thorough care or rushed care, and physician has good contextual knowledge about the patient.

Several studies have assessed the relationship between the patient-perception-of-physician variables and individual PA domains. Zachariae found that attentive and empathic communication from physicians was positively associated with cancer-related self-efficacy.⁸⁰ Epstein posited that knowledge of the patient as a person, patient-centered orientation, and trust affect physician communication.⁶⁹ Some evidence shows that shorter visits to the physician have less patient-centered communication (PCC).⁸¹

Patients who were more trusting of physicians desired less participation in their care.⁸² It should be noted that the opposite relationship was observed between trust and PA when measured with the PAM.^{33, 38} Kaplan and Beisecker found that longer visits increased shared decision

making.^{83, 84} Physicians alike reported a lack of time and not enough information as the biggest barriers to shared decision making.⁷⁴ Physician competence has been shown to be negatively associated with participation.⁷²

Despite believing that assertiveness is a subset of shared decision making, I found that assertiveness (leaving a physician practice) was associated with patient-perception-of-physician, social–environmental variables. Patients were less likely to leave a physician practice voluntarily when they trusted their physicians, and felt their physicians communicated well, were friendly and caring, and were knowledgeable about them.^{73, 85} Patients who experienced shorter visits were more likely to switch doctors.⁷³ Individuals seeking information tend to go to sources they trust.^{27, 64} Lastly, patients who receive clear answers from physicians are more likely to look at health information.⁶⁴ In another study, patients who felt their physicians listened to them, showed respect, and spent enough time with them were less likely to seek information.⁸⁶

Overall, positive, patient-perception-of-physician variables supported PA domains (eg, knowledge, friendliness), while negative perceptions were barriers to PA (eg, short or rushed visits). Therefore, I hypothesize the same relationships will occur in this study.

Patient Activation as a Predictor of Information-seeking Behavior

Medicare Part D was a new program operating under a consumer choice model; therefore, the underlying assumption was that beneficiaries would understand the importance and need for seeking Medicare Part D information. However, according to the Wilson Model, once a person identifies a need for information, the need causes the individual to make a decision to seek, and, once the decision to seek is made, the individual decides how information is sought.²⁷ The information is then processed and used. Progression through the model might be supported or undermined by a variety of demographics, physical functioning, cognitive functioning, psychological variables, interpersonal, environmental or situational variables, and source characteristics intervening variables. Barriers often

prevent people who need information from seeking it. The Medicare Part D information-seeking process was not immune to these barriers; trust,^{5, 14, 16} access,^{5, 16, 23} wait times,¹⁶ ability to find information in general,^{4, 22, 23, 39} and the ability to find accurate informative, knowledgeable and useful sources,^{5, 7, 16, 23} all affected Medicare Part D information seeking.

Wilson posited that activating mechanisms would help individuals seek in spite of circumstances and would allow them to overcome barriers.^{27, 87} Wilson attempted to explain these activating mechanisms through the Stress and Coping, Social Cognitive, and Risk/Reward Theories. A key feature of the Stress and Coping and Social Cognitive Theories is self-efficacy that, in turn, can enhance or impede a person's motivation to act. Some individuals might intentionally avoid seeking information because seeking it causes them stress or anxiety, while individuals with poor self-efficacy are not confident in their ability to seek successfully, so they do not.²⁷ When people have high self-efficacy they cope with the challenges associated with decision making by means of adaptive actions; in this case the adaptive action is information seeking.

Information Seeking

PA includes self-efficacy within its definition; therefore, it might also be viewed as an activating mechanism that helps individuals overcome barriers.³⁵ I believe that patients with higher PA are more likely to look for information on Medicare Part D before making a decision. Williams found active patients were more likely to make informed decisions about Medicare Part D.³² Similar behaviors were observed among patients selecting a doctor. Patients with higher activation levels were more likely to look up information on physicians before selecting one, compared to patients with lower levels of activation. PA is also a predictor of patients comparing information on hospitals and the ability to process that information by making a quality choice.³⁵

Number of Information Sources

Consumers tend to engage in a large amount of information seeking when they have

uncertainty associated with decision making to cope with perceived risk.²⁷ Uncertainty and confusion exist around Medicare Part D;^{5, 20, 23, 26} therefore, studying the number of sources used provides an estimate of the burden of the Medicare Part D information-seeking process. Referring back to the stress and coping theory, and to the social cognitive theory, once actions are taken, highly efficacious people invest more effort and persist longer than do those with low efficacy. Consumers who are most activated are thought to maintain activation under stress;⁵⁴ therefore, it seems appropriate to examine the relationship between PA and number of sources used. I also believe beneficiaries with higher levels of PA will use a higher number of information sources. Studies have found that individual PA domains are related to more information seeking. Individuals with high self-efficacy tend to put more effort into seeking information,²⁷ and patients with a preference for patient-centered roles use multiple information sources.⁸⁸

Nonpreferred Information Channels

Past research has shown that the way beneficiaries prefer to receive information about coverage decisions is mismatched with how information is dissemination.²⁵ With Medicare Part D, beneficiaries' reports of the sources that they would likely use did not always translate into actual use of those sources.¹¹ This mismatch might mean that some beneficiaries were not reached because barriers both perceived and actual prevented them from using information disseminated through alternative channels.^{11, 25} Beneficiaries who prefer to receive information interpersonally might not seek information via the Internet or print because of their low literacy level. Seniors reported not seeking clarification of Medicare Part D from another source when needed.⁵ Highly efficacious people recover more quickly and maintain the commitment to a goal when setbacks occur; therefore, I believe that individuals with high PA will be more likely to overcome barriers and will seek information through nonpreferred information channels when necessary. One study supported my position. Consumers with high PA, but low literacy and numeracy were better able to comprehend information about health plans

and make high quality decisions compared to consumers with low PA and low literacy and numeracy.³⁵ Based on these relationships I propose that PA will increase the likelihood of seeking, using multiple information sources, and using a nonpreferred information source.

Racial/Ethnic Differences

Many racial/ethnic differences in PA and information seeking have been observed,^{23, 25, 31-34} but we do not know why they exist. A critique of health disparities research is that it routinely lacks social context⁸⁹ and often only looks for outcome differences by race/ethnicity.⁹⁰ Simply looking at a dummy variable that show a difference in outcomes does not explain why the difference exists. Therefore, this dissertation attempts to move the discussion forward by looking beyond mean outcome differences and by examining the social context that might shape these outcomes. The Social Network Model provides a framework for studying disparities because it points out, at the most distal point, that discrimination and race relations can affect networks, support systems, and, ultimately, health outcomes. Expanding the conversation about health disparities from a solely individually mediated one, to one that includes a social-environmental context could explain the racial/ethnic differences observed in this dissertation if they exist.

It is reasonable to expect compositional differences in the social–environmental variables across racial/ethnic groups because of the historical treatment of racial/ethnic minorities in America. For instance, based on a history of unequal treatment in the medical field, it is reasonable to expect mean differences in the patient-perception-of-physician variables.^{89, 90} Black patients tend to mistrust physicians more than do white patients.⁸⁹⁻⁹¹ In addition, elderly black patients feel that their physicians show less compassion; however, they believe that their physicians might be more competent than elderly white patients believe their physicians might be.⁹² Culture might also play a role. For example, having many children might have a different effect on outcomes between racial/ethnic groups because social norms about the role of family might vary.⁹³ Lastly, inequality in resources across neighborhoods

might be the reason that living in an urban area might benefit one group more than another group.⁹⁴ Therefore, any differences observed in the PA might be expected to be the result of compositional differences in the variables that predict it.

Not only are there racial/ethnic differences in PA, but they are also present in PA domains. Racial/ethnic differences in self-efficacy might be SES-dependent. Blustein found that racial/ethnic minorities had lower cardiovascular disease self-efficacy compared to whites in bivariate analyses.⁶⁶ However, after including social economic markers racial differences were attenuated.⁶⁶ Racial/ethnic differences in diabetes self-efficacy were not observed on bivariate analysis.⁹⁵ The absence of differences could be related to the entire sample consisting of low-income patients.

Unlike self-efficacy, more study of racial/ethnic differences has been performed regarding physician communication because researchers have wanted to assess whether physicians give differential treatment to racial/ethnic minorities. Several studies have shown that racial differences are present in patient–provider communication.^{71, 96-98} In one study that assessed participatory physician communication, the bivariate analyses showed that both blacks and other minorities indicated lower levels of communication;⁷¹ however, when control variables were added to the model, blacks (but not other minorities) were less likely to report that their physician’s communication was participatory. Doescher found that, regardless of the inclusion of enabling, predisposing, and need variables, minority patients, blacks, Latinos, and others, reported less satisfaction with physician-communication styles.⁹⁷ Cene found that the quality of communications differed between black and white patients with hypertension and that the lowest quality was observed in black patients with uncontrolled blood pressure.⁹⁶ Interestingly, one study found that black Medicare enrollees reported better communication with their physicians than white enrollees reported.⁹⁹ The role of physician characteristics in racial/ethnic differences in physician communication has also been examined.^{71, 98} Street assessed PCC and did not find any racial differences.⁹⁸ The inclusion of patient–provider racial concordant

variables in the model could explain this finding because, when Cooper-Patrick added racial concordance to her model, the difference between black and white patients was explained away.⁷¹ This relationship speaks to both patients' and providers' possibly preconceived beliefs about the other race/ethnic group when the relationship is discordant.

In the remaining PA domains—shared decision making, assertiveness, and health information seeking—the results of racial/ethnic differences are mixed. Many studies did not find racial/ethnic differences in patients' preferences for shared decision making or with actual decision making.^{72, 76, 100} However, Kaplan did find that minorities were less likely to participate than were white patients.⁸³ When examining assertiveness, blacks were more likely to leave a medical practice than were whites.⁸⁵ Ende found that preference for information seeking did not vary by race.⁷⁶ One study found no difference in actual information seeking by race, but did find differences by ethnicity.⁸⁶ Racial/ethnic differences have been observed with regard to the source of information sought^{40, 101} and information channels through which information is exchanged.²⁵ These racial differences in PA domains might explain racial/ethnic differences observed in Medicare Part D information-seeking behavior if they exist.

The examples above show that racial differences exist in social-environmental variables, PA domains, and information seeking. In addition to studying compositional differences by race, differences in the effect of independent variables on outcomes across race/ethnicity are also of interest. Hibbard found that, although social support predicted PA in blacks and whites, the effect was significantly stronger in whites.³¹ Similarly, PA was a predictor of emotional health in both blacks and whites. Again, the relationship was stronger in white patients. We miss these intricacies when we do not study effects within groups. Sometimes the main effect is not significant; however, under a stratified or a fully interacted race model, these variations become apparent. Drawing on Hibbard's results, I will assume the relationship between social–environmental variables and PA domains; between PA and information seeking, I will assume in this study that the same relationships will be stronger in whites

than in blacks. In addition, I hypothesize that a similar relationship will be observed with whites and Hispanics.

Control Variables

Many other variables are associated with PA and information seeking. Because these variables are not the focus of this dissertation, I will treat them as control variables. Table 6 includes the control variables that will be included in models predicting PA and information-seeking behavior. They include a need for information, sociodemographics, physical and cognitive functioning, prior knowledge, information preferences, and access to care, prescription drugs, and information sources.

Ample evidence is available for controlling for these variables. A summary of the relationships between control variables and PA domains are found in Table 1. All models will be the same for each PA domain; therefore, this study will be the first to examine many relationships. Models are the same because PA is the overarching construct with several domains that are related to one another so it can be expected that there will be similar relationships between the control variable and each domain regardless of whether the relationships have previously been studied. For instance, poor health status was not studied regarding assertiveness and health information seeking; however, that does not mean that these relationships do not exist; thus, these variables are controlled here.

Although Table 1 contains some predictors of health information seeking, additional control variables should be considered when studying Medicare Part D information-seeking behavior. For example, a person's need for information is shaped by situation and context;⁸⁷ therefore, I have included the need for and access to prescription medications as variables in the model because they would shape the need to look for Medicare Part D information. Persons who did not have credible prescription drug coverage, who reported cost-related noncompliance, or who reported that they accessed medications through no-cost or low-cost alternatives would have a greater need for Medicare Part D and information on Medicare Part D to make a decision. In addition, one should consider

Wilson's intervening variables such as demographics (education, income, or gender^{12, 40}), physical functioning (sight, hearing, or walking^{23, 77}), cognitive functioning (literacy, inability to use new technology effectively^{27, 40, 45}), psychological functioning (self-perception of knowledge, style of learning, salience, preferences¹⁰²), interpersonal relationships (attitudes of people providing information, social ties), environmental factors (laws, localization of information, region^{39, 102}), and source characteristics (access, credibility, accuracy, channel of communication^{5, 7, 16}).

Table 1. Antecedents of PA Domains

	Self Efficacy	Physician Communication	Assertiveness	Shared Decision Making	Health Information Seeking
Social-environmental					
Trust		↑ ⁶⁹	↓ ^{62, 73, 85}	↓ ⁸²	
Competence				↓ ⁷²	
Friendliness care, respect			↓ ⁸⁵		
Good communication			↓ ⁸⁵		
Physician provides clear answers to questions					↑ ⁶⁴
Attentive, empathic communication	↑ ⁸⁰				
MD listens clearly					↓ ⁸⁶
MD shows respect					↓ ⁸⁶
Rushed care/short visit		↓ ⁸¹	↑ ⁷³	↓ ^{74, 83, 84}	↑ ⁸⁶
Knowledge of patient		↑ ⁶⁹	↓ ^{73, 85}		
Not enough information				↓ ⁷⁴	
Social network					↑ ^{101, 103}
Social support	↑ ^{67, 68}		↓ ⁷³	↑ ⁷²	↑ ^{64, 101, 103}
Social strain	↓ ⁶⁸				
Married	↑ ⁶⁶	↔ ^{63, 71}		↓ ^{72, 76}	↔ ^{64, 76}
Helper at visit		↑ ⁷⁰		↑ ⁷⁴ ↓ ⁷⁵	↔ ⁶⁴
Family				↓ ⁷⁴	↑ ⁷⁰
Varied by doctor		Yes ⁹⁸	Yes ⁹⁸	Yes ¹⁰⁰	
Urbanity		↔ ⁶³			↔ ⁶⁴

Table 1. Antecedents of PA Domains

	Self Efficacy	Physician Communication	Assertiveness	Shared Decision Making	Health Information Seeking
Neighborhood	Yes ⁶²				Yes ²⁷
Social demographics					
Black	↓ ⁶⁶	↓ ^{71, 97}	↑ ⁸⁵		
Race	↔ ⁹⁵	↔ ^{63, 98}	↔ ⁷³	↔ ^{72, 76, 100}	↔ ⁷⁶
Hispanic	↓ ⁶⁶	↓ ⁹⁷			↓ ⁸⁶
Minority				↓ ⁸³	
Male		↔ ^{63, 71, 98} ↓ ⁹⁷	↓ ⁸⁵ ↔ ⁷³	↔ ^{76, 99, 100} ↓ ^{72, 83}	↔ ^{76, 104, 105} ↓ ^{64, 106}
Low income	↓ ⁶⁶	↓ ⁹⁷	↔ ^{73, 85}	↓ ^{72, 76}	↓ ^{76, 86, 101}
Higher levels of education	↑ ⁶⁶	↑ ^{63, 71, 97} ↔ ⁹⁸	↔ ⁸⁵ ↑ ⁷³	↑ ^{72, 76, 83, 100, 107}	↑ ^{64, 76, 86, 104-106}
Age increasing	↔ ⁶⁶	↑ ^{71, 97} ↓ ⁶³ ↔ ⁹⁸	↓ ^{73, 85}	↓ ^{76, 99, 72, 83} ↔ ¹⁰⁰	↓ ^{64, 76, 86, 106} ↔ ^{104, 105}
Employed				↑ ⁷²	↔ ⁶⁴ ↑ ⁸⁶
Physical and cognitive functioning					
Poor health status	↓ ⁶⁶	↓ ^{71, 97} ↔ ⁶³		↓ ⁷⁶	
Severe physical limitations	↓ ⁶⁶			↓ ⁷²	
Past experience using Rx info					↑ ¹⁰⁸
New medication					↑ ¹⁰⁴
Number of diseases			↔ ⁸⁵		
Type of disease				Yes ^{72, 100, 99}	Yes ¹⁰⁵
Disability evaluation					↓ ⁸⁴
Poor cognitive function					Yes ⁴⁰
Mental component summary			↓ ⁷³		
Personality					
Self-efficacy				↑ ⁸²	↑ ¹⁰⁹
Internal locus of control					↑ ¹¹⁰
Patient is comfortable asking MD questions					↔ ⁶⁴
Patient asks questions					↑ ⁶⁴

Table 1. Antecedents of PA Domains

	Self Efficacy	Physician Communication	Assertiveness	Shared Decision Making	Health Information Seeking
Preference for patient centered care					↑ ⁸⁸
Access to care					
Insurance			↔ ⁷³		↔ ⁶⁴ ↑ ¹⁰¹
No Insurance		↓ ⁹⁷			
Medicaid	↓ ⁶⁶	↓ ⁹⁷			
Public insurance		↓ ⁹⁷			
HMO		↓ ⁹⁷			
Lacked continuity		↓ ⁹⁷	↑ ^{73, 85}		
Needs information					↑ ⁶⁴
Previous knowledge					↑ ⁶⁴
Has a preference for doctor to share information					↑ ⁶⁴

HMO = health maintenance organization; MD = doctor; Rx = prescription drug

Hypotheses

AIM 1: To Examine the Association between Social–Environmental Factors (Patient Perception of Physician, Social Support, and Community) and PA

Self-care Self-efficacy

Hypothesis 1a: Self-care self-efficacy will be lower among beneficiaries who report hurried care and a lack of compassion from their physicians, but will be higher among beneficiaries who have confidence in their physicians and who perceive that their physicians are competent, concerned, thorough, and knowledgeable.

Hypothesis 1b: Self-care self-efficacy will be greater among beneficiaries with more social support.

Hypothesis 1c: Self-care self-efficacy will vary by community.

Physician Communication

Hypothesis 2a: Physician communication will be lower among beneficiaries who report hurried care and a lack of compassion from their physicians, but will be higher among beneficiaries who have confidence in their physicians and who perceive that their physicians are competent, concerned, thorough, and knowledgeable.

Hypothesis 2b: Bringing a helper to one's visit will be positively associated with physician communication, whereas physician communication will not vary by other social support variables.

Hypothesis 2c: Physician communication will vary by community.

Shared Decision Making

Hypothesis 3a: Shared decision making will be higher among beneficiaries who report hurried care and a lack of compassion from their physicians, but will be lower among beneficiaries who have confidence in their physicians and who perceive that their physicians are competent, concerned, thorough, and knowledgeable.

Hypothesis 3b: Shared decision making will be greater among beneficiaries with more social support.

Hypothesis 3c: Shared decision making will vary by community.

Health Information Seeking

Hypothesis 4a: Health information seeking will be higher among beneficiaries who report hurried care and a lack of compassion from their physicians, but will be lower among beneficiaries who have confidence in their physicians and who perceive that their physicians are competent, concerned, thorough, and knowledgeable.

Hypothesis 4b: Health information seeking will be greater among beneficiaries with more social support.

Hypothesis 4c: Health information seeking will vary by community.

Aim 2: To Examine the Association between PA and Information-seeking Behavior of Medicare Beneficiaries Considering Medicare Part D Enrollment

Hypothesis 5: Beneficiaries with higher PA will seek information more often than will beneficiaries with lower PA.

Hypothesis 6: Beneficiaries with higher PA will use a greater number of information sources than will beneficiaries with lower PA.

Hypothesis 7: Beneficiaries with higher PA will to seek information through nonpreferred information channels more often than will beneficiaries with lower PA.

Aim 3: To Determine Whether the Associations among Social–Environmental Factors, PA, and Information Seeking Vary by Racial/Ethnic Subgroups

Hypothesis 8: The relationship between patient-perception-of-physician variables and PA will be stronger in whites than blacks and Hispanics.

Hypothesis 12: The relationship between social support and PA will be stronger in Hispanic and white beneficiaries than in black beneficiaries.

Hypothesis 13: The community variables will have a stronger affect on PA in black and Hispanic beneficiaries than in white beneficiaries.

Hypothesis 14: The positive relationship between PA and information seeking will be weaker for black and Hispanic beneficiaries than for white beneficiaries.

Hypothesis 15: The positive relationship between PA and the number of information sources used will be weaker for black and Hispanic beneficiaries than for white beneficiaries.

Hypothesis 16: The positive relationship between PA and using a nonpreferred information source will be weaker for black and Hispanic beneficiaries than for white beneficiaries.

Summary

More than ever patients need to increase their roles in their health care, including managing their chronic diseases or driving their health care financing and payments. Patients must have a certain level

of motivation or activation to take on these new roles. Given the most recent conceptualization of PA, one could assume that activated patients would have accessed information about Medicare Part D, would be knowledgeable about Medicare Part D, and so would have made informed prescription drug decisions. However, not all beneficiaries do make such decisions. Low PA levels might be one reason for not making such decisions. Future interventions or education campaigns might be tailored to a beneficiary's level of PA. Understanding the relationship between social–environmental variables and PA can help this process. PA is mutable; therefore, interventions can target PA to improve outcomes in vulnerable beneficiaries because the characteristics with which vulnerable beneficiaries are labeled are often static.

CHAPTER 4: METHODS

In this section, I review the data source, study inclusion criteria, sample size, and analysis plan. All statistical analyses were performed with a commercially available software programs (Stata, version 10; StataCorp, College Station, TX and SAS, version 9.1; SAS, Cary, NC).

Data

The data for this study are from the 2004 and 2005 MCBS Access to Care Community Questionnaires fielded by CMS between 2004–2005 and 2005–2006. The MCBS is nationally representative of Medicare beneficiaries living in the United States and its territories. Data are collected on the use and cost of all medical services that beneficiaries use, as well as, demographics, insurance, health, and functional status through face-to-face interviews in the beneficiaries' homes or nursing homes. Proxies are used if respondents are not able to answer the survey questions. The sample was randomly selected from zip codes that were randomly selected from age strata within primary sampling units. The MCBS oversamples the frail elderly and disable. Sample weights are provided to account for the sampling procedures. Respondents are followed up to 4 years in a panel design with 3 rounds over the course of each year. Each year approximately 12,000 beneficiaries are interviewed. On occasion, supplemental questionnaires are administered to gather information on information sources and knowledge about Medicare programs. Data on information seeking and PA come from supplemental questionnaires. The timeline of data collection is explained in Figure 2.

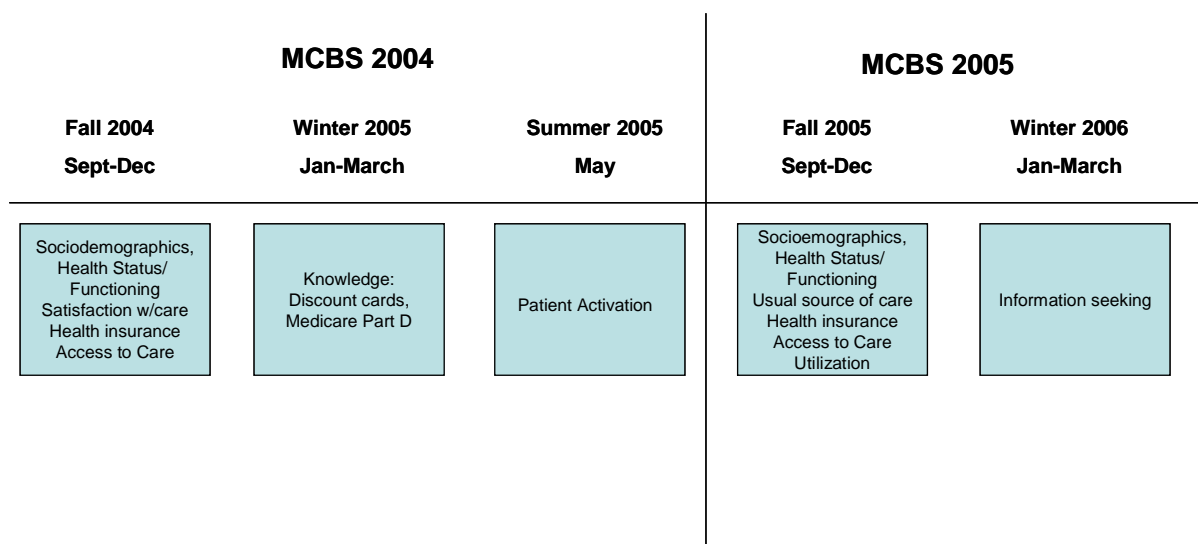


Figure 2. Timeline of data collection.

Sample

To form the sample in Aim 1, respondents were included if they completed the PA supplement in May–August 2005 and had no missing data on the PA items because PA is the dependent variable. This supplement was administered to 11,530 community dwelling beneficiaries who did not need a proxy to respond to the survey. Respondents were also included in the sample if they had an usual source of care. Respondents were excluded if they reported having Alzheimer’s disease or if they had missing race data. The stratified analyses in Aim 3 were limited to only black, white, and Hispanic beneficiaries because of insufficient numbers in the remaining racial groups. The remaining racial groups were not grouped together because the resultant group would be too heterogeneous to have meaningful results in the stratified analysis. There are two samples used for study in Aim 3. The first sample is based on the Aim 1 sample and the second is based on the Aim 2 sample that will be discussed below. Details of the final sample for Aims 1 and 3a are in Figure 3.

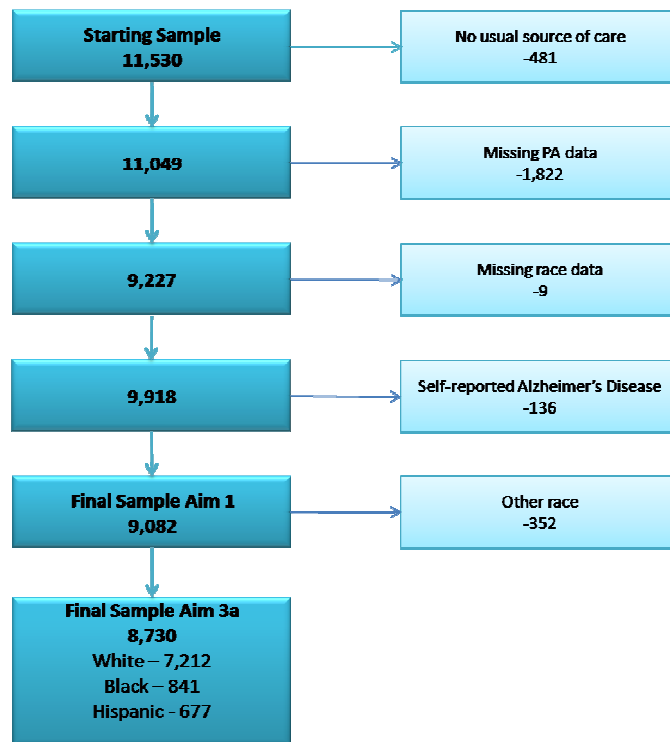


Figure 3. Aims 1 and 3a: Sample size and exclusion criteria.

A large number of beneficiaries were excluded for incomplete PA data because they did not use prescription drugs. The two items in Table 3 with the most data missing represented the use of prescription drugs: Item 2 (665 missing) and Item 9 (1,058 missing). Excluded beneficiaries were less often women (52% vs. 58%), were somewhat older (73.2 years vs. 71.8 years), were slightly less often high school graduates (73% vs. 75%), were less often non-Hispanic blacks (7% vs. 9%), were more likely to report excellent or very good self-rated health (55% vs. 39%), and were less often dually eligible for Medicaid (13% vs. 18%) when compared to retained beneficiaries.

The sample in Aim 2 was based on the final sample in Aim 1. One panel was retired with the 2004 survey; therefore, a quarter of the Aim 2 sample was lost. Respondents were included in the sample if they had completed the knowledge supplement in January–March 2006. Respondents were excluded from the Aim 2 sample if they had missing data on the outcome variables (sought information, information source, and information channel preference), reported having Alzheimer’s disease, and had

missing weight data. Details of the final sample for Aim 2 and 3b are in Figure 4.

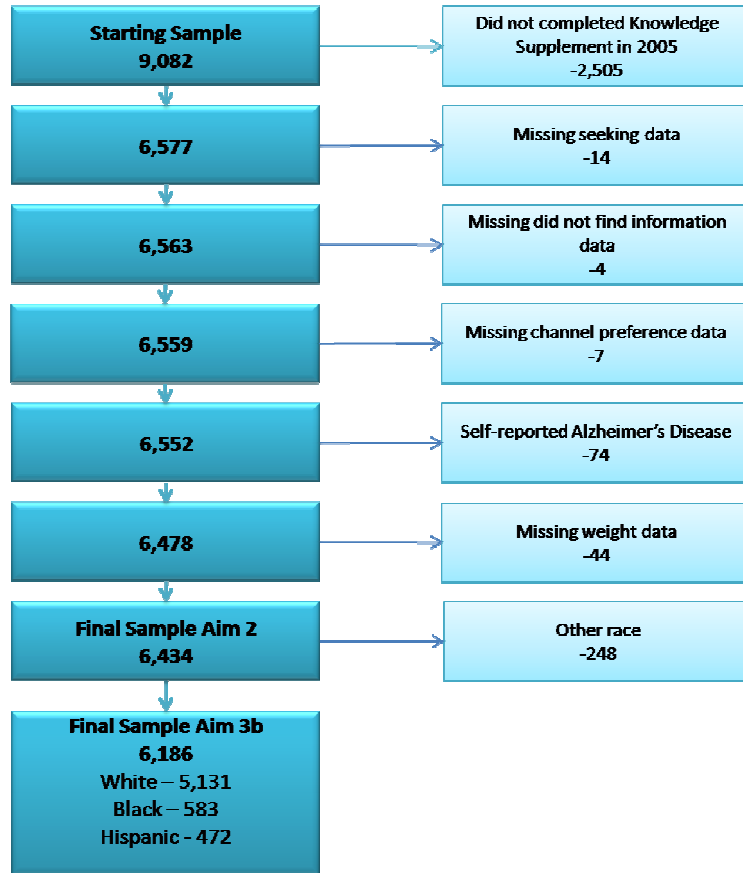


Figure 4. Aim 2 and 3b: Sample size and exclusion criteria.

To detect a small effect size (eg, 0.20) between two population proportions at $\alpha = 0.05$, I needed 392 respondents in each population to have 80% power.¹¹¹ Using the actual sample sizes of blacks and Hispanics, I should be able to detect an effect size as small as 0.05.

Measures

Social–Environmental Variables

Table 2 contains the variables, variables sources, and the unit of measure of each social–environmental variable. The physician-related social–environmental variables include competence, confidence, concern, hurried care, compassion,⁸⁰ thoroughness, and contextual knowledge of the patient.^{64, 69, 72-74, 80-83, 85, 86} Each of the variables for patient perception with physician were measured

dichotomously with 1 represented *agreeing* with the behavior and 0 represented *disagreeing* with the behavior, except for the variable measuring concern where 1 represented being *satisfied* and 0 represented being *dissatisfied*. I recorded the responses of persons who reported that they had no experience with any of the physician-related, social–environmental variables as missing. The social support variables included marital status, living alone, number of children alive, and having a helper for medical visits.^{61, 63-68, 70-78, 112} Each variable is measured dichotomously. Beneficiaries who were married were compared to beneficiaries of all other marital statuses. Lastly, community social–environmental variables included living in community housing and whether the patient lived in an urban area.^{27, 61-64} These variables were also dichotomous. Missing values were assigned if respondents refused to answer or reported that they did not know the answer.

Table 2. Social–Environmental Variables

Variable	Type	Definition	Aim
Patient perception of physician			
Hurried	Dichotomous	Doctor always seems in a hurry 1 = <i>agree/strongly agree</i> ; 0 = <i>disagree/strongly disagree</i>	1,3
Compassion	Dichotomous	Doctor acts as if he is doing patient a favor by talking to them 1 = <i>agree/strongly agree</i> ; 0 = <i>disagree/strongly disagree</i>	1,3
Competence	Dichotomous	Patient feels doctor is competent and well trained 1 = <i>agree/strongly agree</i> ; 0 = <i>disagree/strongly disagree</i>	1,3
Confidence	Dichotomous	Patient has great confidence in doctor 1 = <i>agree/strongly agree</i> ; 0 = <i>disagree/strongly disagree</i>	1,3
Contextual knowledge	Dichotomous	Doctor has a good understanding medical history 1 = <i>agree/strongly agree</i> ; 0 = <i>disagree/strongly disagree</i>	1,3
Concern	Dichotomous	Doctors are concerned about overall health not just a single symptom or disease 1 = <i>V satisfied/satisfied</i> ; 0 = <i>V dissatisfied/dissatisfied</i> , NA	1,3
Thoroughness	Dichotomous	Doctor is very thorough about checking everything 1 = <i>agree/strongly agree</i> ; 0 = <i>disagree/strongly disagree</i>	1,3
Social support			
Lives alone	Dichotomous	1 = <i>yes</i> , 0 = <i>no</i>	1,2,3
Marital status	Dichotomous	1 = <i>married</i> , 0 = <i>not married</i> (separated, divorced, widowed)	1,2,3
Number of children alive	Dichotomous	1 = <i>none</i> , 2 = <i>one</i> , 3 = <i>two</i> (reference 3 or more)	1,2,3

Table 2. Social–Environmental Variables

Variable	Type	Definition	Aim
Takes another person to visit	Dichotomous	1 = <i>takes person on visit</i> ; 0 = <i>does not take anyone to visit</i>	
Community			
Community housing	Dichotomous	Does individual live in community housing. 1 = <i>yes</i> , 0 = <i>no</i>	1,3
MSA	Dichotomous	1 = <i>MSA</i> , 0 = <i>not MSA</i>	1,2,3

MSA = metropolitan statistical area; V = very NA = not applicable

Patient Activation

The items and domains of the Medicare PA instrument are found in Table 3. The 15 items are grouped in the 5 domains identified by Williams and Heller.³² These domains include self-care self-efficacy, physician communication, assertiveness, shared decision making, and health information seeking. In this instrument, assertiveness is measured by items that assess whether patients tell their doctors that they do not agree with care, whether they talk with their doctors about treatment options, and whether they had changed doctors. By definition when patients are assertive they make greater requests for information, participate in decision making, are skeptical about and question physician diagnoses and recommendations, doctor shop, request second opinions, and request more or better health services.¹¹³ Asking questions and being assertive have been defined as examples of active decision making.¹⁰⁰ Therefore, I believe that the domain items reflecting assertiveness and shared decision making should be grouped together in 1 factor. To test this assumption, I conducted a confirmatory factor analysis (CFA), reviewing several goodness-of-fit tests to evaluate each model. The classic measure of model fit is the Chi-square (χ^2) test. When values are small and nonsignificant, model fit is good.¹¹⁴ The χ^2 test can be sensitive to sample size;¹¹⁵ therefore, two other fit indices were used: the root mean square error of approximation (RMSEA) that is insensitive to sample size, and the comparative fit index (CFI) that compares the user specified model to a baseline more restricted model. Fit is acceptable if the RSMEA is 0.06 or less and CFI is 0.95 or greater.¹¹⁵

Table 3. MCBS PA Instrument

Domains	Item
Self-care self-efficacy	1. How confident are you that you can identify when it is necessary for you to get medical care? (1 = <i>very confident</i> , 2 = <i>confident</i> , 3 = <i>somewhat confident</i> , 4 = <i>not at all confident</i>)
	2. How confident are you that you can identify when you are having side effects from your medications? (1 = <i>very confident</i> , 2 = <i>confident</i> , 3 = <i>somewhat confident</i> , 4 = <i>not at all confident</i>)
	3. Doctors often give instructions about how you should care for yourself at home, like changing a bandage, taking medicines on schedule, or applying ice packs. How confident are you that you can follow instructions to care for yourself at home? (1 = <i>very confident</i> , 2 = <i>confident</i> , 3 = <i>somewhat confident</i> , 4 = <i>not at all confident</i>)
	4. Doctors often give instructions about changing your habits or lifestyle, such as changing your diet, stopping smoking, or getting regular exercise. How confident are you that you can follow this kind of instruction to change your habits or lifestyle? (1 = <i>very confident</i> , 2 = <i>confident</i> , 3 = <i>somewhat confident</i> , 4 = <i>not at all confident</i>)
Assertiveness	5. How likely are you to change doctors if you are dissatisfied with the way you and your doctor communicate? (1 = <i>very likely</i> , 2 = <i>likely</i> , 3 = <i>unlikely</i> , 4 = <i>very unlikely</i>)
	6. How likely are you to tell your doctor when you disagree with him or her? (1 = <i>very likely</i> , 2 = <i>likely</i> , 3 = <i>unlikely</i> , 4 = <i>very unlikely</i>)
	7. Do you always, usually, sometimes, or never, talk with your doctor about your options if you need tests or follow-up care? (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
Shared decision making	8. Do you always, usually, sometimes, or never, bring with you to your doctor visits a list of questions you want to cover? (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
	9. Do you always, usually, sometimes, or never, take a list of all your prescribed medicines to your doctor visits? (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
Patient–provider communication	10. Do you always, usually, sometimes, or never, leave your doctor's office feeling that all your concerns or questions have been fully answered? (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
	11. The following always, usually, sometimes, or never happens. My doctor listens to what I have to say about my symptoms and concerns. (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
	12. The following always, usually, sometimes, or never happens. My doctor explains things to me in terms that I can easily understand. (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
	13. The following always, usually, sometimes, or never happens. I can call my doctor's office to get medical advice when I need it. (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
Information seeking	14. Do you always, usually, sometimes, or never, read about health conditions in newspapers, magazines, or on the Internet? (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)
	15. Do you always, usually, sometimes, or never, read information about a new prescription drug, such as side effects and precautions? (1 = <i>always</i> , 2 = <i>usually</i> , 3 = <i>sometimes</i> , 4 = <i>never</i>)

Each domain was tested for internal consistency with Cronbach's alpha. Alphas less than 0.6 are considered unacceptable.¹¹⁶ Domain scores were calculated by adding the scores of the individual items, dividing by the number of items in the domain, and multiplying by 10. All domains have scores ranging from 10–40. Lower scores represented higher PA. In addition to individual domain scores, I will assess whether an overall PA score is possible. Higher order factor analysis would be conducted to determine whether an overall domain score was appropriate. If a single factor is identified the individual domain score will be added together and divided by the number of domains. Therefore, the overall summary score will also range from 10–40 with lower numbers presenting higher PA. PA is the outcome in Aim 1; therefore, only beneficiaries with complete PA data were included in the analysis.

Information-seeking Behavior

Table 4 contains the variables, variables sources, and the unit of measure of each variable. I measured need for Medicare Part D information dichotomously.²⁷ I determined whether beneficiaries actually looked for information from any source using a dichotomous variable. Not all respondents who looked for information found it; therefore, I created a dummy variable identifying this select group of beneficiaries. Respondents were given a list of 17 possible information sources: Medicare agency including the 1-800 number; the Medicare Web site; Medicare publications; Medicare Advantage plans; Social Security Office; state Medicaid agency; other government agency; insurance company; Medigap or supplemental or PDP; current or previous employer or union; family or friends or coworkers; pharmacy; health care provider, including doctors, lab, or hospital; Media, including newspaper, radio, TV; American Association of Retired Persons (AARP) or other organization; seniors' counselor; and the Internet. The use of a particular source was measured dichotomously (yes–no). I created a count variable to establish the number of different sources that beneficiaries used to find information. The variable determining the use of a nonpreferred information channel was based on whether the source that was used fell into respondents' preferred channel of receiving information. The preferred channels

include talking with others, brochures or pamphlets, media (newspapers, magazines, TV, radio), the Internet, and other channels. The link between the source and channel is found in Table 5.

Respondents were given a value of 1 if they indicated that the information on prescription drug coverage was the most important type of Medicare information they needed.

Table 4. Information Behavior Variables

Variable	Type	Definition	Aim
Sought Information	Dichotomous	Beneficiary looked for info on Rx coverage 1 = <i>yes</i> , 0 = <i>no</i>	2,3
Found information	Dichotomous	Prescription drug information was found 1 = <i>yes</i> , 0 = <i>no</i>	2,3
Type of information source	Dichotomous	17 categories 1 = <i>used</i> , 0 = <i>did not use</i>	2,3
Number of sources used	Count	Sum of the type of sources used	2,3
Nonpreferred information channel used	Dichotomous	Beneficiaries who use information sources which are communicated through nonpreferred channels 1 = <i>nonpreferred channel</i> , 0 = <i>preferred channel</i>	2,3
Need for Part D information	Dichotomous	Rx coverage was topic most important to have information on 1 = <i>yes</i> , 0 = <i>no</i>	2,3

Rx = prescription drug

Table 5. Information Sources within Information Channels

Information channel	Information source
Talking with others	Medicare agency including the 1-800 number Medicare Advantage plans Social security office State Medicaid agency Other government agency Insurance company Medigap or supplemental or PDP Current or previous employer or union Family or friends or coworkers Pharmacy Health care provider: doctors, lab, or hospital AARP or other organization Seniors counselor
Brochures and pamphlets	Medicare publications
Media	Media
Internet	Medicare Web site Internet site other than Medicare

Table 5. Information Sources within Information Channels

Information channel	Information source
---------------------	--------------------

AARP = American Association of Retired Persons; PDP = prescription drug plan

In both the information source and the channel preference variables, respondents were allowed to select the category *Other* if the source or channel they used was not on the list. These respondents were then asked to specify the source used or channel they preferred. I examined each response to determine whether it could be reclassified into the existing categories. For instance, if respondents stated that they wanted information over the telephone, they were reclassified as preferring the interpersonal channel. Similarly, if people stated that they wanted a brochure they were reclassified as having preferred written information channels. Of the 63 beneficiaries who listed the *Other* channel preference, 22 were reclassified into the interpersonal channel and 4 into the brochure channel. Thirty-eight beneficiaries remained in the *Other* channel preference after reclassification. The numbers do not add up because some respondents had already selected the interpersonal or brochure channels prior to the reclassification. Less *Other* information sources could be reclassified. Of the 48 in the *Other* group, 10 were reclassified. If beneficiaries stated that they learned about Medicare Part D from the Veterans Administration, they were reclassified as having sought information from a health care provider.

There was much heterogeneity within the *Other* information source variable and the *Other* channel preference; therefore, I did not match these two variables together when creating the variable about use of a nonpreferred channel. However, I was able to match information sources specified in the *Other* information channel with a channel preference from the list of examples provided. For example, if the beneficiaries stated that they talked to an insurance agent and their preferred information channel was interpersonal channel, they would be matched as having used a preferred channel. Missing values were assigned if respondents refused to answer or reported that they did not

know the answer.

Control Variables

Table 6 contains the variables and the unit of measure of each control variable. They include sociodemographics, physical and cognitive functioning, access to information source, access to care, access to prescription drugs, prior knowledge, and information preference. For Aim 1, the following control variables were included in the models measuring the relationship between social–environmental variables and PA: sociodemographics (age, sex, race/ethnicity, education, employment, and income);^{63, 64, 66, 69-73, 76, 81, 83, 85, 86, 95, 97, 98, 100, 101, 104-107} physical and cognitive functioning (self-reported health status, change in health status, number of self-reported diseases, ability to see, ability to hear, cognitive function, concentration, insurance decision making capacity, activities of daily living [ADL] instrumental activities of daily living [IADL], and literacy);^{40, 63, 66, 71-73, 76, 84, 85, 97, 100, 104, 105, 107} and access to care (trouble getting care, delayed care, supplemental health insurance).^{64, 66, 69, 73, 85, 97, 101} Although no single study assessed the impact of sight and hearing on PA, many of the activities asked about in the Medicare PA instrument require these physical abilities, so they were included as control variables.

The variables for supplemental insurance coverage and health literacy index were constructed. Some beneficiaries had more than one type of supplemental insurance; therefore, respondents were classified in one of the following categories in hierarchical order: Medicaid, Medicare HMO, employer-sponsored insurance (ESI), individually purchased coverage (eg, Medigap, Tricare), *Other* public insurance, or traditional FFS Medicare only, for analytical purposes. Similar classifications have been used in previous studies.^{117, 118}

There is no direct measure of health literacy in the MCBS. Hibbard created a literacy screening index in a Medicare elderly population that could be used as a proxy for the short test of functional health literacy in adults (S-TOFHLA).¹¹⁹ Scores for age, education, and self-rated health status were

used to calculate the screening index. The scores range from 3 to 17. A person has adequate health literacy if his or her score is 11 or greater.

Table 6. Control Variables

Control variables	Type	Definition	Aim
Sociodemographics			
Age	Continuous	In years	1,2,3
Sex	Dichotomous	1 = <i>male</i> , 0 = <i>female</i>	1,2,3
Education	Dichotomous	High school graduate 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Employed	Dichotomous	Individual is currently working 1 = <i>yes</i> , 0 = <i>no</i>	1,2,3
Race/ethnicity	Dichotomous	Black, Hispanic, white (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Household income	Dichotomous	< \$25,000, > \$25,000 (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Physical and cognitive functioning			
Self-reported health status	Dichotomous	Excellent/very good, good, fair/poor (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Change in health status	Dichotomous	Better, same, worse than last year (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Number of diseases	Count	Sum of number of diseases asked of respondents in MCBS	1,2,3
Difficulty seeing	Dichotomous	No trouble (reference) , a little trouble/ a lot of trouble 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Difficulty hearing	Dichotomous	No trouble (reference) , a little trouble/ a lot of trouble 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Seeing effects learning about Medicare	Dichotomous	Amount of trouble finding things to know about Medicare No trouble (reference) , a little trouble, a lot of trouble 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Hearing effect learning about Medicare	Dichotomous	Amount of trouble finding things to know about Medicare No trouble (reference) , a little trouble, a lot of trouble 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Cognitive/mental impairment	Dichotomous	Defined to include any of the following: depression, mental disorder, or mental retardation; memory loss that interferes with daily activity; or having problems making decisions that interferes with activities of daily living. 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Trouble concentrating	Dichotomous	Trouble concentrating or keeping mind on what you are doing 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Health insurance decision	Dichotomous	Gets help on decision, Someone else makes decisions,	2,3

Table 6. Control Variables

Control variables	Type	Definition	Aim
making		Makes own decision (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	
ADL	Dichotomous	ADL vs. No ADL 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
IADL	Dichotomous	IADL vs. no IADL 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Access to information source			
Literacy screening index	Dichotomous	Screening index created from age, education, and health status. (Scores > 11 = <i>high literacy</i>) 1 = <i>high literacy</i> ; 0 = <i>low literacy</i>	1,2,3
Internet access	Dichotomous	1 = <i>yes</i> , 0 = <i>no</i>	2,3
Access to care			
Trouble getting care	Dichotomous	Reported not getting care for any reason 1 = <i>yes</i> , 0 = <i>no</i>	1,2,3
Delayed care	Dichotomous	Delayed care because of costs 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Type of supplemental health insurance	Dichotomous	Medicaid, HMO, employer, Tricare/self-purchased, public/none (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	1,2,3
Access to Rx			
Prescription drug coverage in 2005	Dichotomous	1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Drug discount card	Dichotomous	Individual uses official drug discount card 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Did not get medication	Dichotomous	1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Asked for generic	Dichotomous	Often/sometimes, never (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Shopped around for best price	Dichotomous	Often/sometimes, never (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Got medication from outside the United States	Dichotomous	Often/sometimes, never (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Smaller dose due to cost	Dichotomous	Often/sometimes, never (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Skipped dose due to cost	Dichotomous	Often/sometimes, never (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Asked for samples	Dichotomous	Often/sometimes, never (reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Preferences			
Preferred information	Dichotomous	Internet, talk to others, pamphlets, media, other	2,3

Table 6. Control Variables

Control variables	Type	Definition	Aim
channels		(reference) 1 = <i>indicated</i> , 0 = <i>not indicated</i>	
Prior knowledge			
Medicare approved discount cards	Dichotomous	Did you know there were Medicare-Approved Prescription Discount Cards? 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3
Medicare Part D	Dichotomous	Did you know Medicare would start providing prescription drug coverage January 1, 2006? 1 = <i>indicated</i> , 0 = <i>not indicated</i>	2,3

ADL = activities of daily living; IADL = incidental activities of daily living; HMO = health maintenance organization; MCBS = Medicare Current Beneficiary Survey; Rx = prescription drug

When predicting whether individuals sought information in Aim 2, the following control variables were included in the model: sociodemographic (age, sex, race/ethnicity, education, employment, income);^{27, 86, 87, 120} physical and cognitive functioning (self-reported health status, change in health status, number of self-reported diseases, ability to see, ability to hear, ability to hear or see effects ability to learn about Medicare, cognitive function, concentration, insurance decision making capacity, ADL, and IADL);^{27, 40, 120} access to information source (literacy, Internet access)²⁷; access to care (trouble getting care, delayed care, supplemental health insurance); access to prescription drugs (drug coverage in 2005, drug discount card use, asked for generic medication, shopped for the best medication price, bought medications outside the United States, took a smaller dose of medication due to cost, skipped doses due to costs, asked for samples);⁴⁰ and prior knowledge (awareness of Medicare discount cards, awareness of Medicare Part D).²⁷

The control variables for the Aim 2 model, which assessed the use of a nonpreferred channel, included sociodemographics, physical and cognitive functioning, access to information source, access to care, access to prescription drugs, and number of information sources. Prior knowledge was not included in this model, because how one searches is driven by the risk associated with the decision to be made.²⁷ Knowledge or awareness of about Medicare Part D a year before the program would be

associated with the need for information and the decision to seek. Lastly, the model measuring the number of information sources used included sociodemographics, physical and cognitive function, access to information source, access to care, access to prescription drugs, prior knowledge, and number of information channel preferences.

Analysis

Aim 1: To Examine the Association between Social–Environmental Factors (Patient Perceptions of Physician, Social Support, and Neighborhood) and PA

First, descriptive statistics were conducted on all variables. Categorical variables are reported as frequencies and percents, while count and continuous variables are reported as means and standard deviations. I assumed all PA domain scores were continuous and would follow a normal distribution. To test this assumption, I examined normality graphically and inferentially using the Shapiro-Wilk test.¹²¹ I also assessed multicollinearity using variance inflation factors (VIFs). Variables with a VIF of greater than 10 were not included in the final model.¹²¹ I used the `—collin—`function in Stata to examine multicollinearity diagnostics. This function provides VIF results without needing to run a regression model; thus, the diagnostics are applicable across all of the PA domains.

PA is a continuous variable; therefore, ordinary least square (OLS) regression models were used to examine the relationship between model predictors and PA. Several assumptions are made when using OLS regression:¹²¹

1. The relationship with the independent and dependent variables is linear.
2. The residuals are normally distributed.
3. The mean residual is equal to zero.
4. The variance is homoskedastic.
5. The observations are independent. I address how the analysis changes when assumptions were not met.

The basic measurement model for predicting PA is as follows:

Equation 1. Predicting PA Domain

$$PA_i = \beta_0 + \beta_1 SE_i + \beta_2 D_i + \beta_3 PCF_i + \beta_4 AC_i + e_i$$

where PA_i , the dependent variable, is the vector of each PA domain. Therefore, 5 models will be estimated, 1 each for self-care self-efficacy, physician communication, assertiveness, shared decision making, and health information seeking. The independent variables of interest are the social–environmental variables. In Equation 1., SE_i is a vector of all the social–environmental variables including, patient perception of physician (eg, competence, confidence, concern, hurried care, compassion, thoroughness, contextual knowledge), social support (eg, marital status, number of children living, lives alone, has a helper to go to the doctor), and community (eg, lives in community housing, urbanicity). The remaining variables in the equation are vectors-of-control variables (eg, sociodemographics [D_i], physical and cognitive functioning [PCF_i], and access-to-care variables [AC_i]). Table 6 contains a list of all the control variables under each of these categories. The sociodemographic variables include age, sex, education, employment status, income, and race/ethnicity. The PCF variables include self-reported health status, change in health status, number of self-reported diseases, ADLs, IADLs, difficulty seeing, difficulty hearing, cognitive impairment, literacy, and concentration. The AC variables include trouble getting care, delayed care, and supplemental health insurance. The error term, e , is the unexplained variance after controlling for covariates. The subscript i represents the individual. Highly collinear variables will be removed from the final model; therefore, some of the variables listed might not make it into the final model. Variables with a VIF of greater than 10 were not included in the final model.¹²¹

Model Diagnostics

If the dependent variables are not normally distributed, analyzing the data using linear models

would lead to biased estimates.¹²² Therefore, the correct distribution had to be identified to analyze the data correctly. There are several options for analyzing nonnormally distributed data. One option is to transform the data by taking the log, cube, square, inverse, inverse square, and inverse cube produce a normal distribution. If a normal distribution results from transformation, linear regression models can be used. In cases where data are log transformed, retransformation back to the original scale can be problematic and corrections like smearing factors are needed.¹²³

The next option, generalized linear models (GLM), should be considered when transformation does not result in a normal distribution. These models allow the mean to be modeled as a nonlinear function of the covariates.¹²⁴ There are two components of GLM, the family and the link functions. The family is where a distribution is specified for the outcome variable. The possible families that could be specified include gamma, Poisson, negative binomial, Gaussian, or inverse Gaussian. The link function specifies how the mean of the outcome variable of a particular distribution is related to the predictors in the model. Several link functions such as identity, logit, and log are present. We can make an assumption about the family based on visual inspection of the data; however, the modified Park test can be used to determine whether our selection is correct and can direct us to an alternative distribution if it is not correct.¹²⁵ The coefficient that was produced in the modified Park test is calculated by regressing the log-predicted outcome on the squared residuals. The residual coefficient is used to determine which distribution is correct. A coefficient of zero indicates Gaussian, 1 a Poisson distribution, 2 a gamma distribution, and 3 an inverse Gaussian distribution. If a distribution is not identified through the modified Park test, I will compare Bayesian information criterion (BIC) of models with families closest to the coefficient produced through the modified Park test. For example, if the coefficient is 1.35, BIC of a Poisson and gamma model will be compared. The model with the smallest BIC has a better fit and will be presented.¹²⁶ The BIC is a comparison of a model with no predictors to the proposed model predicted by Bayesian posterior probabilities. Larger posterior probabilities

correspond with smaller BIC.

Technically any link function can be used with any family function. However some links fit better because they map the linear predictor to values implied by the family function.¹²⁶ For example in a binomial model, the range of values is between 0 and 1. The logit function is often used with the binomial family because the predictors fall within this range. An identity link could be used; however, predicted values often fall outside the range of 0 and 1. One way to assess link fit is by comparing deviance. The deviance captures the distance between the predicted values and the outcomes by comparing the fitted model to a fully specified model. Smaller deviance means the link is a better fit.¹²⁶ The BIC can also be used. If the difference between BIC is less than 2, there is a weak preference for the model with the lower BIC. If the BIC is larger than 2, the preference for the model with the lower BIC is stronger. The interpretation of model coefficients differs by link function. For simplicity, all models will be run with the identity link. Model-fit statistics will be presented to compare the identity link-to-link functions commonly associated with different families. For Poisson, gamma, and inverse Gaussian distributions the log link will be compared to the identity link.

Minimum Important Difference

When interpreting results of scales like the Medicare PA instrument, significant differences are not always meaningful. To detect important effects of the independent variables on the PA domains I assessed the minimum important difference (MID). I used a distribution-based approach which used the standard error of measurement (SEM) to calculate MID.^{127, 128} The equation for measuring the MID with a small effect is as follows:

Equation 2. Minimum Important Difference Calculation

$$MID = SD\sqrt{1-r}$$

where SD is the standard deviation of the PA domain and r is the reliability of the domain measure by Cronbach's alpha. I also calculated the MID using the half-SD method.

Sample Weights

Complex survey design was used to gather the MCBS sample. The sample was randomly selected from zip codes that were randomly selected from age strata within primary sampling units. Survey weights are needed to make inference back to the population surveyed. Using weights makes estimates more accurate and corrects standard errors. A raw sample weight is the inverse of the probability of selection.¹²⁹ However, these raw weights are then adjusted for nonresponse and under or over coverage of the sample through post stratification adjustments. In MCBS, there are both cross-sectional and longitudinal weights. The cross-sectional weight for 2004 was used in Aim1 and cross-sectional weight for 2005 was used in Aim 2. For Aim 3, I used the cross-sectional weight for 2004 when predicting PA and the cross-sectional weight for 2005 when predicting information behavior. To account for the stages of sampling, the strata and PSU were included in the adjustment.

Missing Data

In survey research, missing data might not be missing at random; therefore, it is nonignorable. It is possible that those with missing data on the outcome variables are different from those not missing information. In addition, someone's refusal to respond might be correlated with other variables. In this study, many values were missing in the data, either from beneficiaries refusing to respond, not knowing the answer, or having a question that was not applicable because of a lack of experience with the scenario or not being asked.

There are several ways to deal with missing data. It is common to delete cases with missing dependent variable (Y) observations. When Williams and Heller studied PA, they deleted cases with no prescription drugs use.³² Cases with missing PA data were deleted from this analysis also. To avoid a substantial reduction in sample size, we did not delete observations with missing independent variable (X) data. Beyond case deletion, missing independent variable data can be handled in many different ways.¹³⁰ I chose to use multiple imputations (MI).

MI is a procedure where missing data are imputed several times using regression imputation to produce several different complete data estimates of parameters. The parameter estimates for each imputation are then combined to give an overall estimate of the data parameters as well as an estimate of the standard errors. With MI the data are replicated, imputed, analyzed, and then combined. I used the IVEware software to impute missing variables (IVEware, The Regents of the University of Michigan). This software works on a SAS platform. I chose IVEware because it imputes integers, allows survey weights to be included in the imputation, and it provides savable datasets that can be used with other statistical software packages. The data underwent 10 iterations and produced 2 datasets. IVEware uses a process called sequential regression multivariate imputation (SRMI). This process takes the variables with missing data and orders them by missingness. The first missing value is regressed on the fully observed variables, X. Then the remaining missing variables are regressed on the fully observed Xs plus the newly imputed variable with the least number of missing values. The process is repeated until every variable has been imputed. Each time the equation gets larger because the imputed variables are added to the equation. The whole cycle of predicting each variable in the sequential process was repeated 5 times before a single dataset was produced. Each cycle represents 1 iterate. Rubin suggested anywhere from 2–10 iterations were necessary to create unbiased imputed estimates.^{131, 132}

Aim 2: To Examine the Association between PA and Information-seeking Behavior of Medicare Beneficiaries Considering Medicare Part D Enrollment

In this aim, multiple equations were estimated to measure the probability that a beneficiary looked for information, the number of information sources used, and the likelihood of using a nonpreferred source to learn about Medicare Part D. Descriptive statistics were conducted on all variables. Categorical variables are reported as frequencies and percents, while count and continuous variables are reported as means and standard deviations. Differences between groups were assessed

using Chi-square tests for categorical variables and *t* test or ANOVA for continuous variable. In addition to the correlations, I also assessed multicollinearity using VIF (Appendix B). Sample weights were used when estimating the models in this aim.

Medicare Part D Information Seeking

The outcome is dichotomous; therefore, a logistic regression model was used to study the relationship between Medicare Part D information seeking and model predictors. The binary outcome, Y , can be thought of as a proxy for an underlying continuous latent variable Y^* ,

$$\text{where } Y = \begin{cases} 1, & \text{if } Y^* > c \\ 0, & \text{otherwise} \end{cases}.$$

The logistic model estimates the probability that the outcome ($Y = 1$) exceeds a threshold c of the latent construct Y^* . The logistic model estimates the probability of $Y = 1$ using a standard logistic distribution as shown in Equation 3.¹³³

Equation 3. Logistic Regression Model

$$\Pr(Y_i = 1) = \frac{1}{1 + \exp^{(-Z_i)}}$$

The model parameters (Z) are linearized through the logit function. Logistic regression model parameters are estimated using maximum likelihood estimation. Maximum likelihood estimation is an iterative process which attempts to choose estimates from a set of unknown parameters that maximize the likelihood function.¹³³ For ease of interpretation, I will present the results as a ratio of the odds, the odds ratio (OR). The logistic regression model estimates the odds as shown in Equation 4, where the probability that the outcome equals 1 is divided by the sum of 1 plus the probability of the outcome equaling 1. Essentially the model parameters, Z , are exponentiated to the base e .

Equation 4. Calculation of Odds Ratio

$$\text{OddsRatio} = \frac{\Pr(Y = 1)}{1 + \Pr(Y = 1)} = \exp(\alpha + \sum_{k=1}^K \beta X) = \exp(Z) = e^Z$$

The basic measurement model for the logistic regression model is as follows:

Equation 5. Logistic Regression Model Predicting Seeking Medicare Part D Information

$$\Pr(sought = 1) = \frac{1}{1 + \exp^{\beta_0 + \beta_1 PA_i + \beta_2 N_i + \beta_3 D_i + \beta_4 ARx_i + \beta_5 AI_i + \beta_6 PCF_i + \beta_7 AC_i + \beta_8 K_i}}$$

where the dependent variables is the probability of seeking. The independent variables of interest are

the PA domains. In Equation 5, PA_i represents a vector of the PA domains, self-care self-efficacy,

physician communication, assertiveness, shared decisions making, and health information seeking.

The remaining variables in the equation are vectors of control variables (eg, need Medicare Part D

information (N_i), sociodemographics (D_i), access to prescription drugs (ARx_i), access to information

(AI_i), physical and cognitive functioning (PCF_i), access-to-care variables (AC_i), and prior knowledge

(K_i). Table 6 contains a list of all the control variables under each of these categories. The

sociodemographic variables include age, sex, education, employment status, income, marriage, and

race/ethnicity. The PCF variables include self-reported health status, change in health status, self

reported diseases and a count of these diseases, ADLs, IADLs, difficulty seeing, difficulty hearing,

problems with seeing prevent learning about Medicare, problems with hearing prevent learning about

Medicare, cognitive impairment, trouble concentrating, and makes own insurance decisions. The AC

variables include trouble getting care, delayed care, and supplemental health insurance. The access to

prescription drugs variables include having prescription drug coverage in 2005, Medicare prescription

discount card use, asked for generic medications, shopped around for the best price, bought

medication outside of the United States, asked for samples, took less medication, and skipped doses.

The access to information variables included literacy and access to the Internet. Prior knowledge or

awareness variables include knowing about Medicare discount cards and Medicare Part D in 2004. The

subscript i identifies the individual.

Use of Nonpreferred Information Channels

The use of a nonpreferred information channel could be studied simply by logistic regression in the subset of beneficiaries who looked for information because they were the only people in which this behavior was observed. The general form of this logit model is as follows:

Equation 6. Model Predicting Nonpreferred Information Channel Use

$$\Pr(\text{non-preferred} | \text{sought} = 1) = \beta_0 + \beta_1 PA_i + \beta_2 N_i + \beta_3 D_i + \beta_4 PCF_i + \beta_5 AI_i + \beta_6 ARx_i + \beta_7 AC_8 + \beta_9 IS_i$$

where the dependent variable is the probability of using a nonpreferred information channel if the beneficiary sought Medicare Part D information. The independent variables of interest are the PA domains. In Equation 6, PA_i represents a vector of the PA domains, self-care self-efficacy, physician communication, assertiveness, shared decisions making, and health information seeking. The remaining variables in the equation are vectors of control variables (eg, need Medicare Part D information (N_i), sociodemographics (D_i), access to prescription drugs (ARx_i), access to information (AI_i), physical and cognitive functioning (PCF_i), access-to-care variables (AC_i), and number of information sources used (IS_i)). Table 5 and Table 6 contain a list of all the control variables under each of these categories. The sociodemographic variables include age, sex, education, employment status, income, marriage, and race/ethnicity. The PCF variables include self-reported health status, change in health status, self reported diseases and a count of these diseases, ADLs, IADLs, difficulty seeing, difficulty hearing, problems with seeing prevent learning about Medicare, problems with hearing prevent learning about Medicare, cognitive impairment, trouble concentrating, and makes own insurance decisions. The AC variables include trouble getting care, delayed care, and supplemental health insurance. The access to prescription drugs variables include having prescription drug coverage in 2005, Medicare prescription discount card use, asked for generic medications, shopped around for the best price, bought medication outside of the United States, asked for samples, took less medication, and skipped doses. The access to information variables included literacy and access to the Internet. The number of information sources is a sum of the different information sources used in Table

5. The subscript i identifies the individual.

The model in Equation 6 might suffer from sample selection bias. Information seekers might have different characteristics than nonseekers.¹³³ These unobserved characteristics could have led to their refusal to look for information. This means there is potential for the error in terms of the 2 equations to be correlated. To adjust for this problem I estimated a second model, a sample selection model estimated using maximum likelihood estimation. Both models have binary outcomes; therefore, I used a Heckman probit model. The selection equation, which predicts whether a beneficiary sought information (Equation 5), must include at least 1 variable not found in the equation assessing the use of a nonpreferred channel (Equation 6). These variables are called instruments. Prior knowledge is a determinant of the decision to seek, but not necessarily how one seeks;²⁷ so prior knowledge questions were only included in the selection equation. The instruments were tested to determine whether they predict nonpreferred channel use predicted in Equation 6.

The Heckman selection model produces a parameter, ρ , which measures the correlation between the 2 equations. If ρ is significantly different from zero the Heckman probit model should be estimated. If ρ does not differ from zero, there is no correlation between the errors of the model estimating seeking and the model estimating nonpreferred channel use in Equation 6. Therefore, only the model estimating nonpreferred channel use is necessary. While I tested probit models, I present the results of a logistic regression if only Equation 6 is estimated because it is easier to interpret ORs than the coefficients on a probit model. I compared logit estimates to a probit model estimating nonpreferred channel use to support this decision. Equation 6 may also be estimated if the Heckman probit model does not converge.¹³³

Number of Information Sources.

To estimate the impact of PA on the number of sources used, count models are appropriate.¹³³ Count models usually follow a Poisson or negative binomial distribution. We can estimate the

probability distribution of information source count (Y), given the covariates in the model (x). The expected number of events (u) for an individual (i), is $u_i = E(y_i | x_i) = e^{\beta x_i}$. The probability distribution for the Poisson regression model is in Equation 7:

Equation 7. Poisson Regression Model

$$\Pr(Y_i = y_i) = \frac{e^{-u_i} u_i^{y_i}}{y_i!}$$

where the outcome is the probability of the outcome (Y_i) equals a certain count value (y_i).

Many respondents did not look for information; therefore, there is a preponderance of zeros in the model. Excess zeros in a model might lead to heterogeneity, so estimation with a regular Poisson model might not be appropriate.¹³³ Excess zeros can also lead to overdispersion. One assumption of Poisson models is that the mean and the variance are equal; when the variance is larger than the mean there is overdispersion. If there is overdispersion, a negative binomial model is preferred to the Poisson model because the negative binomial model relaxes the assumption that the mean equals the variance. The negative binomial model includes an additional error term that accounts for the overdispersion. The exponentiated error term has a gamma distribution. The inclusion of the error term does not affect the u , only the variance of y . The probability distribution for the negative binomial regression model is in Equation 8.

Equation 8. Negative Binomial Regression Model

$$P(Y_i = y_i) = \frac{\Gamma(y_i + 1/a)}{\Gamma(1/a)\Gamma(y_i + 1)} \left(\frac{(a\mu)^{y_i}}{(1 + a\mu)^{y_i + 1/a}} \right)$$

where 'a' and Γ refer to the negative binomial dispersion parameter and the gamma function.

As mentioned above excess zeros can lead to heterogeneity. There are 2 ways of handling the zeros: a zero inflated model or a hurdle model. Both models make different assumptions about the generation of zeros.¹³⁴ In zero inflated models, there are true zeroes and sampling zeros. Some people

did not intend to look for information because they did not intend to enroll in Medicare Part D; therefore, the number of information sources used might never be greater than zero. This select group represents the true zeros. They are not at risk of an event. Some beneficiaries expected to enroll in Medicare Part D and intended to use information, but for some reason were not able to. These beneficiaries represent the sampling zeros; they are at risk of an event despite their count as zero. The excess zeros could be result of either the sampling or true zeros. Alternatively, the hurdle model assumes the process for determining zeros is different from the process of determining nonzero.¹³⁵ It assumes that everyone is at risk of an event and that an event is inevitable once the first stage or hurdle is crossed. Hurdle models are estimated by determining whether the event occurred or not. Then conditional on having an event occur, a truncated Poisson or negative binomial model is estimated on the positive events. Choosing 1 model over the other depends on whether the zeros are truly different from the nonzeros.

I chose a zero-inflated model to estimate the number of information sources used to learn about Medicare Part D over a hurdle model for 2 reasons. First, there are countless stories about people wanting to look for information, but not feeling that they had the skills to look;²⁶ and, second, I actually can identify some of the sampling zeros in the data because a number of respondents looked for information, but could not find it, so their count is zero. The hurdle model does not account for these people by modeling the process of zeros separately from the nonzero.¹³⁴

There are 2 types of coefficients to interpret in zero inflated models. They include the coefficients on the logit model that predict excess zeroes and the coefficients from the Poisson or negative binomial regression part of the zero-inflated model that predict number of information sources. Of most interest are the coefficients on the Poisson or negative binomial portion of the zero-inflated model; they are interpreted just like the coefficients of a Poisson or negative regression model. The coefficients are equal to the difference in the natural log of the expected number of sources of information for each unit change in the variable of interest. Because the coefficients are not actual

counts, I will also present the discrete change for easier interpretation. The discrete change is the difference in the number of sources of information as an independent variable changes and all other variables are held constant at their mean. For binary independent variables, the effect of a 1-point change will be presented, whereas a half-SD change will be presented for continuous variables like PA. The measurement model for the expected number of information sources is as follows:

Equation 9. Expected Number of Information Sources

$$u_i = E(y_i | x_i) = e^{\beta_0 + \beta_1 N_i + \beta_2 PA_i + \beta_3 D_i + \beta_4 PCF_i + \beta_5 AI_i + \beta_6 ARx_i + \beta_7 AC_8 + \beta_9 P_i + \beta_{10} K_i}$$

where the dependent variable is the expected number of information sources. The independent variables of interest are the PA domains. In Equation 9, PA_i represents a vector of the PA domains, self-care self-efficacy, physician communication, assertiveness, shared decision making, and health information. The remaining variables in the equation are vectors of control variables (eg, need Medicare Part D information (N_i), sociodemographics (D_i), access to prescription drugs (ARx_i), access to information (AI_i), physical and cognitive functioning (PCF_i), access-to-care variables (AC_i), prior knowledge (K_i), and number of information channel preferences (P_i). Table 5 and Table 6 contain a list of all the control variables under each of these categories. The sociodemographic variables include age, sex, education, employment status, income, marriage, and race/ethnicity. The PCF variables include self-reported health status, change in health status, self reported diseases and a count of these diseases, ADLs, IADLs, difficulty seeing, difficulty hearing, problems with seeing prevent learning about Medicare, problems with hearing prevent learning about Medicare, cognitive impairment, trouble concentrating, and makes own insurance decisions. The AC variables include trouble getting care, delayed care, and supplemental health insurance. The access to prescription drugs variables include having prescription drug coverage in 2005, Medicare prescription discount card use, asked for generic medications, shopped around for the best price, bought medication outside of the United States, asked for samples, took less medication, and skipped doses. The access to information variables included

literacy and access to the Internet. Prior knowledge variables include knowing about Medicare discount cards and Medicare Part D in 2004. The number of information channel preferences is a sum of the different information channel preferences in Table 5. The subscript i identifies the individual.

The probability of an individual using a specific number of sources in a zero-inflated Poisson (ZIP) or a zero-inflated negative binomial (ZINB) model is shown in Equation 10 and Equation 11.

Equation 10. Zero Inflated Poisson Model Estimating the Probability of Using a Specific Number of Sources

$$\Pr(IS = y_i) = \begin{cases} p_i + (1 - p_i)e^{-u_i} & \text{if } y_i = 0 \\ (1 + p_i) \frac{e^{u_i} u_i^{y_i}}{y_i!} & \text{If } y_i > 0 \end{cases}$$

Equation 11. Zero Inflated Negative Binomial Model Estimating the Probability of Using a Specific Number of Sources

$$\Pr(IS = y_i) = \begin{cases} p_i + (1 - p_i) \frac{1}{(1 + a\mu)^{1/a}} \\ (1 + p_i) \frac{\Gamma(y + 1/a)}{\Gamma(y_i + 1)\Gamma(1/a)} \left(\frac{a\mu^{y_i}}{(1 + a\mu)^{y_i + 1/a}} \right) \end{cases}$$

The dependent variable is the probability of a specific number of information sources (IS), u is the expected number of information sources estimated in Equation 9, y_i is a specific number of sources (eg, 0, 1, 2, etc.), and a is the dispersion parameter. In this equation, p_i is the probability of having structural zeros. This probability was estimated using logistic regression with the following covariates, Medicaid enrollment, ESI, HMO enrollment, Tricare/Medigap enrollment, and literacy.

A likelihood ratio test was used to determine whether a negative binomial model should be used over a Poisson model or to determine whether a ZINB model should be used instead of a ZIP model because these 2 models are nested. The likelihood ratio test tests whether the overdispersion parameter is zero.¹³³ The test statistic is $\chi^2 = -2 \ln L_P - [-2 \ln L_{NB}]$ where $\ln L_P$ is the fitted log-likelihood of Poisson Model and $\ln L_{nb}$ is the fitted log-likelihoods for the negative binomial model. It

follows a Chi-square distribution with 1 degree of freedom. To test whether a zero inflated model should be used over a regular Poisson or a negative binomial model, I used the Vuong test. The Vuong test checks for overdispersion due to excess zeros (eg, beneficiaries who could not find information).¹³⁶ The Vuong test is needed because the Poisson and ZIP models are not nested within each another.

Aim 3: To Determine Whether the Associations among Social–Environmental Factors, PA, and Information Seeking Vary Across Racial/Ethnic Subgroups

In Aims 1 and 2, racial differences in PA and information-seeking behavior are identified through the race/ethnicity dummy variables included in the models. In those models the race/ethnic dummy variables are statistically significant, then race/ethnicity has a unique and independent influence on PA and information-seeking behavior, given the role of other regression variables. In this aim, I assess whether there are compositional differences between the covariates by racial/ethnic group. In addition, I assess whether the effects of coefficients in the regression models are the same across racial/ethnic subgroups through stratified analyses. These analyses will help determine whether there are true differences between racial groups or whether differences are caused by variation within groups.¹³⁷ Information-seeking studies have found that testing differences across strata was necessary because of compositional differences in income by race.¹²⁰ Lastly, I decomposed observed racial/ethnic gaps in PA and information-seeking behavior into expected and unexpected differences. .The expected differences would be attributed to differences in characteristics while the unexpected difference might be attributed discrimination or unmeasured characteristics. All analyses were limited to white, black, and Hispanic beneficiaries.

I assessed bivariate relationships with each covariate and racial/ethnic group. This assessment will identify whether there are compositional difference across groups. Next, I ran regression models to predict PA domains as was done in Aim 1, but stratified by racial/ethnic group. These models determine whether the coefficients on other independent variable have a different effect on PA across

racial/ethnic groups. I predicted PA domains using GLM and adjust for weighting. In addition, all the models run in Aim 2 were be stratified by race/ethnicity. The Chow test is used to test whether coefficients of different groups are the same in linear regressions.^{122, 133} There is an alternative for testing whether coefficients differ across groups in nonlinear models.¹³³ The test statistic is $\chi^2 = -2 \ln L_c - [-\ln L_b + (-\ln L_w) + (-\ln L_h)]$ where $\ln L_c$ is the fitted log-likelihood of the whole sample and $\ln L_b$, $\ln L_w$, and $\ln L_h$ are the fitted log-likelihoods of the black, white, and Hispanic samples, respectively. It follows a Chi-square distribution with $k_b + k_w + k_h - K_c$ degrees of freedom. Some researchers suggest that there should be an equal number of observations in each group when calculating the Chow test because results from the combined sample might be influenced greatly by the subgroup with the most observations.¹³⁸ In this study, there are almost 10 times more whites than blacks and Hispanics; therefore, a 15% random sample of whites ($n = 866$) was identified to calculate Chow test statistics.

The Chow tests gives an estimate of the overall difference between models, but not how each coefficient differs by subgroup. To determine the magnitude of the effect of the independent variables for each subgroup, a dummy variable could be interacted with every variable in the model; however, these models are not parsimonious. In addition, because I estimate nonlinear models, the magnitude and standard errors of the interaction effects must be corrected.¹³⁹ The correction would be computationally taxing, so the stratified approach is being proposed. The stratified model approach is equivalent to estimating a race-based fully interacted model.^{122, 140} A comparison between the stratified and fully interacted model approaches can be found in Appendix E (Tables 50 and 51). This example predicts self-care self-efficacy. The interaction effects in Table 51 are the sum of the coefficients of the main effect and the interaction term. This interaction effect is equivalent to the coefficients in the corresponding race stratified model in Table 50. Again, these 2 approaches are equivalent; therefore,

only the stratified approach is presented in the results section. There is no direct interaction term in the stratified model; however, it can be calculated by taking the difference in coefficients of the same variable between racial/ethnic groups. To assess whether the racial/ethnic differences in coefficients (the interaction term) are significant the following t test will be calculated:

Equation 12. T Test for Difference in Coefficients across Different Regression Models

$$T = \frac{b_{lb} - b_{lw}}{SE_{lb}^2 + SE_{lw}^2}$$

where b_{lb} and b_{lw} are the coefficients for independent variables for the black group and white subgroups, respectively. The difference between coefficients is actually the coefficient on the interaction term in a fully interacted model. The acronym SE represents the standard errors of the vulnerable and nonvulnerable subgroups for independent variables.

The bivariate analyses show whether there are differences in covariates across the racial/ethnic groups (eg, differences in composition) and the stratified regression analysis show whether the effects of covariates differ between groups. Both compositional differences and effect differences contribute to differences in the outcome variables. The relative importance of these differences can be disentangled through decomposition.¹⁴¹ As a result, the differences in the dependent variable are divided into explained differences, which result from differences in characteristics and unexplained differences, which are attributed to nonmeasured factors (eg, language, trust, or discrimination). To calculate the explained or acceptable difference, regression coefficients for whites (β) are paired with characteristics (X) of whites and characteristics of the minority group and the difference in the predicted values that result from these pairings is the acceptable difference ($F(X^w, \beta^w) - F(X^b \beta^w)$). To calculate the unexplained difference, black characteristics are paired with coefficients of whites and coefficients of the minority group and the difference in the predicted values that result from these pairings is the unacceptable difference

$$(F(X^b, \beta^w) - F(X^b \beta^b)).$$

Summary

This dissertation used survey data to study PA and Medicare Part D information-seeking behavior. The data on PA and information seeking were obtained from supplements administered in the MCBS. The data is more representative of the entire Medicare population compared to other studies that have addressed similar questions. In Aim 1, I studied the predictors of PA domain with a focus on social–environmental variables. Generalized linear models were used to assess these relationships. In Aim 2, I assessed the relationship between PA and 3 information-seeking behaviors, information seeking, number of information sources, and nonpreferred channel use. A logistic progression will be estimated in the model predicting Medicare information seeking. A zero-inflated model will be used to estimate information source count. A Heckman selection model will be used to estimate nonpreferred channel use. Lastly, Aim 3 studies most models in Aims 1 and 2 stratified by race/ethnicity. Survey weights will be used in each aim to control for the complex survey design.

CHAPTER 5: RESULTS

This chapter includes all the results of this dissertation. I will present the results by study aim. In each section, I will review the descriptive statistics first followed by the regression results. Before I discuss the results from each aim, the factor analysis results are reviewed.

Determination of the Number of Patient Activation Domains

The CFA was used to determine whether the 4-factor model that combined the assertiveness items with the shared decision making items was preferred to the original 5 factors proposed by Williams and Heller. In the 4-factor model, the χ^2 value was 4,309 and the p value was significant. In the 5-factor model, the $\chi^2 = 2467$ with a significant p value. The analysis yielded an RSMEA and CFI of 0.088 and 0.882, respectively for the 4-factor model. The RSMEA and CFI were 0.066 and 0.933, respectively for the 5-factor model. These indices show the 5-factor model has a better fit. A χ^2 difference test was also performed to confirm the results seen in the separate model analysis. The difference test was significant indicating the 5-factor model was preferred to the 4-factor model ($\chi^2 = 1333$; p value < .0001).¹⁴²

Although the 5-factor model was preferred to the 4-factor model, the indices still did not indicate a good fit because the RSMEA was greater than 0.06 and the CFI was less than 0.95. Further, the internal consistency was poor for the assertiveness and shared decision-making domains. Cronbach's alphas were 0.74, 0.77, 0.54, 0.53, and 0.67 for self-care self-efficacy, physician communication, assertiveness, shared decision making, and health information seeking, respectively in the Aim 1 sample. The alphas remained the same in the reduced sample used in Aim 2. These alphas

are similar to the alphas reported by Williams and Heller in the 2001 MCBS sample.³²

A principal components analysis was conducted to determine whether there was a better factor structure than either I, or Williams and Heller proposed. A 4-factor solution was identified as 4 Eigen values were greater than 1. The factor loadings of the 4 new factors are in Table 7. There was no change to the self-care self-efficacy domain; the same 4 items listed in Table 3 loaded together. Their factors loadings fall under factor 2 in Table 7. The physician-communication domain now included an additional item that was previously in the assertiveness domain (item 7, Table 3). This additional item asked about talking with one's physician; therefore, it is reasonable that it loaded with the other physician-communication items. These items loaded on factor 1 in Table 7. The remaining 2 items in the assertiveness domain loaded together on their own factor (factor 4, Table 7). Lastly, the old shared-decision-making and health-information-seeking domain items all loaded together on a single factor (factor 3). These items measured information gathering and exchange, so I left the domain with the name, health information seeking. The Cronbach's alphas for the new 4-factor solution were 0.74 for the self-care self-efficacy domain, 0.78 for the physician-communication domain, 0.57 for the assertiveness domain, and 0.65 for the health information-seeking domain. Yet again, the assertiveness domain had undesirable internal consistency. The analysis yielded an RSMEA and CFI of 0.074 and 0.916, respectively.

Table 7. Factor Loadings for the Medicare PA Instrument (N = 9,082)

Item	Factor 1	Factor 2	Factor 3	Factor 4
1	0.0161	0.7393	-0.0405	0.0613
2	-0.0443	0.7325	-0.0177	0.0864
3	0.0481	0.7657	0.0219	-0.0286
4	0.0202	0.6875	0.0519	-0.0887
5	-0.0451	-0.0257	-0.0033	0.8564
6	0.0029	0.0708	-0.0074	0.7902
7	0.4325	0.1882	0.1992	0.1323

Table 7. Factor Loadings for the Medicare PA Instrument (N = 9,082)

Item	Factor 1	Factor 2	Factor 3	Factor 4
8	0.0116	-0.1101	0.7263	0.1162
9	0.0599	-0.2265	0.6804	-0.0042
10	0.7098	0.0338	0.0303	-0.0164
11	0.8544	-0.019	-0.0559	-0.0416
12	0.8461	0.0236	-0.0673	-0.0052
13	0.6748	-0.044	0.0132	-0.0115
14	-0.1014	0.1812	0.7085	-0.1019
15	-0.0583	0.1905	0.6845	-0.0269

N = number

The factor scores generated during the principal component analysis loaded on a single higher order factor; therefore, an overall PA summary score was calculated and it is included in all the analyses. The factor solution information and loadings are in Table 8.

Table 8. Higher Order Factor Loadings for the Medicare PA Instrument Domains

Domain	Factor 1
Self-care self-efficacy	0.5887
Assertiveness	0.4598
Health information seeking	0.4896
Physician communication	0.5158

Aim 1: To Examine the Association between Social–environmental Factors (Patient Perception of Physician, Social Support, and Community) and PA

Descriptive Statistics

There were 9,082 respondents studied in this aim. The sample represented approximately 23.4 million Medicare beneficiaries. Population characteristics are found in Table 9. The mean age of the respondent was 71.8 years (SE = 0.14), 41.5% were male, 79.6% were white, 74.1% were high school graduates, 56.3% had incomes less than \$25,000, 62.6% had adequate literacy, and 15.2% were dually eligible for Medicaid. On average, beneficiaries had 3 comorbid conditions. Almost 3 quarters

experienced at least 1 ADL and just under 1 quarter of beneficiaries had cognitive or mental impairment.

Very few seniors lived in community housing (6%), but 3 quarters of beneficiaries lived in urban areas. Just over half of beneficiaries were married, 1 third lived alone, over half had 3 or more living children, and just over 1 third of beneficiaries took a helper to the doctor with them. A large majority of beneficiaries had positive perceptions of their physician; over 90% of beneficiaries agreed or strongly agreed their physician was thorough, competent, confident, knowledgeable, and concerned. Very few beneficiaries reported their physician lacked compassion; however, more beneficiaries reported that they received rushed care from their physician.

Beneficiaries were the least activated when it came to seeking health information, but were most activated with physician communication. The mean PA scores were 17.0 (SE = 0.17), 16.2 (SE = 0.15), 17.3 (SE = 0.15), and 21.9 (SE = 0.14) for the self-care self-efficacy, physician communication, assertiveness, and health information-seeking domains, respectively. The overall PA summary score was 18.1 (SE = 0.12).

Table 9. Characteristics of the Aim 1 Sample	
Variable	Total (N = 9,082)
Sociodemographic	
<i>Race/ethnicity</i>	
White	79.6%
Black	9.1%
Hispanic	7.4%
Age in years (SE)	71.8 (0.14)
Male	41.5%
Employed	11.2%
High school graduate	74.1%
Income < \$25K	56.3%
Adequate literacy	62.6%

Table 9. Characteristics of the Aim 1 Sample

Variable	Total (N = 9,082)
Physical and cognitive functioning	
<i>Health status</i>	
Excellent/very good	40.5%
Good	33.8%
Fair/poor	25.7%
<i>Health compared to last year</i>	
Better	15.8%
Same	61.7%
Worse	22.6%
Mean number of diseases (SE)	3.8 (0.03)
Problems seeing	28.6%
Problems hearing	31.9%
At least one ADL	72.2%
At least one IADL	55.8%
Poor cognitive function	23.6%
Problems concentrating	11.5%
Access to Care	
Trouble getting care	4.2%
Delayed getting care	8.4%
<i>Health insurance</i>	
Medicaid	15.2%
HMO	15.0%
ESI	35.4%
Tricare/Medigap	23.2%
Public/FFS	11.2%
PA domain scores	
Mean SCSE (SE)	17.0 (0.17)
Mean PC (SE)	16.2 (0.15)
Mean assertiveness (SE)	17.3 (0.15)
Mean HIS (SE)	21.9 (0.14)
Mean PA summary (SE)	18.1 (0.12)

Table 9. Characteristics of the Aim 1 Sample

Variable	Total (N = 9,082)
<i>Social environment</i>	
Thorough	93.9%
Competent	98.7%
Confident	94.5%
Not compassionate	5.3%
Hurried care	15.4%
Content knowledge	96.2%
Concerned	95.5%
Married	54.6%
Lives alone	31.0%
<i>Number of living children</i>	
No living children	9.1%
One living child	10.8%
Two living children	25.3%
Three or more living children	54.7%
Takes helper to the doctor	35.0%
Lives in community housing	6.0%
Lives in a urban area	75.0%

ADL = activities of daily living; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental ADL; ESI = employer sponsored insurance; FFS = fee-for-service; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; SCSE = self-care self-efficacy; SE = standard error

Although VIFs were used to assess multicollinearity, correlations between variables were also examined to assess the potential impact that the interrelationships could have on the multivariate regressions. I focus on correlations greater than 0.3 in the text below. The tables in Appendix D present the Pearson correlation coefficients of the variables used in Aim 1. The patient-perception-of-physicians variables were all positively correlated with one another, but were not highly correlated with other variables. Thoroughness and confidence were positively correlated ($r = 0.490$, $p < 0.001$) as was thoroughness and knowledge ($r = 0.401$, $p < 0.001$) and knowledge and confidence ($r = 0.481$,

$p < 0.001$). Married beneficiaries had more children and were less likely to live alone ($r = -0.691$, $p < 0.001$), less likely to make $< \$25,000$ ($r = -0.4037$, $p < 0.001$), less likely to have Medicaid, and were more often male. Beneficiaries who lived alone were more likely to have incomes $< \$25,000$ and were less likely to be male. Beneficiaries who took helpers to the doctor were more likely to have ADLs, IADLs, and poor literacy. There were no significant correlations with community housing or MSA.

The PA domains were all correlated with one another. The strongest correlation was between self-care self-efficacy and physician communication ($r = 0.406$, $p < 0.001$). The PA summary score and the health-information-seeking PA domain were also highly correlated with education. Having at least a high school education was associated with higher PA. Activated beneficiaries were more likely to have adequate literacy.

Among the control variables, beneficiaries with at least a high school education were less likely to have incomes less than \$25,000. Beneficiaries with less than \$25,000 in income had poorer health status and literacy. They were also less likely to have ESI. As beneficiaries aged, they were less likely to report cognitive impairment, problems with concentration, adequate literacy, and trouble getting care or delaying care, but were more likely to have poor health status. Dual eligibles were younger, minorities, unmarried, and less educated; and had low income, poorer health status, and poorer cognitive function. Literate beneficiaries were less likely to have ADLs or IADLs. Poorer health status was associated more comorbid conditions, reporting health was worse than the year before, poor cognitive function, ADLs, and IADLs. Beneficiaries with sight problems were highly likely to claim that their sight caused them problems in learning about Medicare. Beneficiaries with poor cognitive function had problems concentrating, had IADLs, and delayed getting needed care. Beneficiaries who had trouble concentrating, were more likely to have IADL, and delayed getting needed care. Beneficiaries with ADLs were also likely to have IADLs ($r = 0.473$, $p < 0.001$). Delaying care was positively associated with not getting needed care. People enrolled in HMOs tended to live in urban areas.

Regression Analyses

All the proposed variables were included in the analyses that follow because no variable had a VIF >10, indicating a lack of multicollinearity (Appendix B: Tables 43 and 44). The distribution of PA domains scores differed across domain. None of the domain scores were normally distributed and transforming the data did not help. Figures of the distributions and transformations are found in the Appendix C. Therefore, generalized linear models were used to estimate PA score. Appendix E (Tables 47 and 48) provides a summary of the modified Park test and link comparison results. The self-care self-efficacy, assertiveness, and the PA summary scores followed a gamma distribution; the coefficients on the Modified Park tests were not significant. The coefficients generated from the modified Park test for the physician communication and health information-seeking domains were significant, so I compared deviance and BIC for the distributions closest to the coefficients. For the physician-communication domain, I compared the model fit results of the gamma and inverse Gaussian distributions; the inverse Gaussian had the lowest BIC so this distribution was used in the analysis. I compared the model fit of the gamma and Poisson distributions for the health information-seeking domain and the Poisson distribution had the best fit.

The identity link was used for all models. Only in 1 case, the health information-seeking domain, the difference in BIC between models with differing link functions indicated that the log link would be preferred over the identity link. As stated previously the identity link was used for ease of interpreting coefficients. When the identity link is used, model coefficients are interpreted as the change in the PA domain score for a 1-unit change in independent variables. Table 10 show the regression results for each of the PA domains, where negative coefficient mean better PA. The results of the regression models predicting PA are discussed in the following sections by PA domain. For each domain, I discuss the impact of social–environmental variables and end with a brief discussion of the control variables that are significant.

Self-care Self-efficacy

The community social–environmental variables, community housing and urbanicity, did not significantly predict self-care self-efficacy; however, 3 social support variables did. Married beneficiaries and beneficiaries who lived alone had greater levels of self-care self-efficacy; the self-care self-efficacy scores would decrease by 0.581 ($p < 0.01$) points if married and by 0.500 ($p < 0.01$) points if living alone. Bringing a helper to the doctor had a negative effect on self-care self-efficacy because scores increased by 0.360 ($p < 0.05$) points. The only patient-perception-of-physician variable related to self-care self-efficacy was hurried care. Beneficiaries' scores increased 0.533 ($p < 0.05$) points, indicating poorer self-care self-efficacy. The regression indicates that the variables for race/ethnicity are statistically significant in influencing self-care self-efficacy. All minority beneficiaries had poorer self-care self-efficacy compared to their white counterparts; self-care self-efficacy scores were 0.777 ($p < 0.05$), 0.809 ($p < 0.05$), and 1.104 ($p < 0.05$) points greater for blacks, Hispanics and others, respectively. Although these variables had significant coefficients, they were not important differences. The MID for self-care self-efficacy was 2.886 for the SEM approach and 2.943 for the half-SD approach.

There were several control variables with significant relationships with self-care self-efficacy. Of the sociodemographic variables, increasing age, being male, and having an income of less than \$25K were associated with poorer self-care self-efficacy. Alternatively, beneficiaries with a high school education had greater levels of self-care self-efficacy. Several physical and cognitive function variables also predicted self-care self-efficacy. While having hearing and sight problems, poor cognitive function, and problems concentrating were associated with poorer self-care self-efficacy, having excellent or very good health, better health than in the previous year, many comorbid diseases, and adequate literacy were associated with greater levels of self-care self-efficacy. The only significant access to care variable was Medicaid; Medicaid recipients had poorer self-care self-efficacy than beneficiaries with

FFS and public insurance. Table 10 shows the results of the regression model predicting self-care self-efficacy. The predicted mean self-care self-efficacy score (17.1; SD = 1.89) was very similar to the raw mean (17.0).

Physician Communication

The community social–environmental variables, community housing and urbanicity, did not predict physician communication; however, two social support variables did. Beneficiaries with no living children had poorer physician communication; the physician-communication scores increased by 0.854 ($p < 0.01$) points. On the other hand, beneficiaries who brought a helper to the doctor had greater levels of physician communication. Their physician-communication scores decreased by 0.304 ($p < 0.05$) points compared to patients without helpers. All the patient-perception-of-physician variables except feeling the physician was competent were significant predictors of physician communication. Lack of compassion and hurried care scores increased by 1.554 ($p < 0.001$) and 1.765 ($p < 0.001$) points, respectively; these variables were associated with poorer physician communication. The remaining patient-perception-of-physician variables were associated with better physician communication. Beneficiaries who reported their physician was thorough had a physician-communication score 1.530 ($p < 0.001$) points lower than patients who did not believe their physician was thorough. Beneficiaries who felt their physician had good content knowledge scores' decreased by 1.737 ($p < 0.001$) points, while beneficiaries who were confident in their physician had a physician-communication score 1.774 points ($p < 0.001$) lower than beneficiaries who did have confidence. When physicians showed concern, physician-communication scores were 1.835 points ($p < 0.001$) lower. Black beneficiaries were the only racial/ethnic minority with significantly different physician communication from their white counterparts. Physician-communication scores were 0.721 points ($p < 0.05$) greater for whites, indicating blacks had poorer physician communication. Although these variables had significant coefficients, the differences were not important. The MID for physician

communication ranged from 2.632 to 2.806 for the SEM approach and the half-SD approach, respectively.

Several control variables had significant relationships with physician communication. Of the sociodemographic variables, increasing age, being male, and having an income of less than \$25K were associated with poorer physician communication. Several physical and cognitive function variables also predicted physician communication. While having vision problems and problems concentrating were associated with poorer physician communication, having excellent or very good health, many comorbid diseases, and adequate literacy were associated with greater levels of physician communication. Physician communication was poorer among beneficiaries who delayed needed care and who enrolled in a HMO. Beneficiaries had greater physician communication if they had ESI and Tricare or Medigap. Table 10 shows the results of the regression model predicting physician communication. The predicted mean physician-communication score (16.3; SD = 2.07) was very similar to the raw mean (16.2).

Health Information Seeking.

The community social–environmental variables, community housing and urbanicity, did not predict health information seeking and only 1 social support variable did predict it. Married beneficiaries were more likely to seek health information; health information-seeking scores decreased by 1.276 points ($p < 0.001$). The only patient-perception-of-physician variables related to health information seeking was hurried and thorough care, whose scores decreased by 0.473 ($p < 0.05$) and 0.842 ($p < 0.05$) points, respectively; these variables were associated with more health information seeking. Both, blacks and Hispanics had poorer health information seeking than had whites; health-information-seeking scores were 1.366 ($p < 0.001$) and 1.330 ($p < 0.05$) points higher among blacks and Hispanics, respectively. Although these variables had significant coefficients, they were not important differences. The MID for health information seeking ranged from 3.850 for the half-SD approach to 4.555 for the SEM approach.

Several control variables had significant relationships with health information seeking. Of the sociodemographic variables, being male, employed, and having an income of less than \$25K were associated with less health information seeking. Alternatively, beneficiaries with a high school education were more likely to seek health information. Several physical and cognitive function variables also predicted health information seeking. Although having hearing problems, at least one ADL, poor cognitive function, and problems concentrating were associated with poorer levels of health information seeking, number of comorbid diseases and adequate literacy were associated with greater levels of health information seeking. Beneficiaries were more likely to seek health information if they were enrolled in a HMO, ESI, and Tricare or Medigap compared to beneficiaries with FFS or public insurance. Table 10 shows the results of the regression model predicting health information seeking. The predicted mean health information-seeking score was 22.1 (SD = 2.82).

Assertiveness

Despite the poor reliability of the assertiveness domain, it was still studied. Very few social–environmental variables predicted assertiveness. None of the community social–environmental and the patient-perception-of-physician variables predicted assertiveness. Two social support variables were related to assertiveness. Beneficiaries with no living children had poorer levels of assertiveness; their assertiveness scores increased by 1.146 points ($p < 0.001$). Married beneficiaries had greater levels of assertiveness than beneficiaries that were not married; their assertiveness scores were 0.532 ($p < 0.05$) points lower. Unlike other domains where blacks had poorer PA, blacks had greater assertiveness. Black beneficiaries were the only racial/ethnic minority with significantly different assertiveness levels from their white counterparts. Black assertiveness scores were 0.655 points ($p < 0.05$) lower than were white assertiveness scores. The variables with significant coefficients were not large enough to be considered important differences. The MID for assertiveness ranged from 3.470 for the half-SD approach to 4.550 for the SEM approach.

Several control variables had significant relationships with assertiveness. Of the sociodemographic variables, increasing age and having an income of less than \$25K were associated with lower levels of assertiveness. Alternatively, beneficiaries with a high school education were more assertive than were beneficiaries without a high school education. Several physical and cognitive function variables also predicted assertiveness. Although having hearing problems, poor cognitive function, and problems concentrating were associated with less assertiveness, having excellent or very good health, a number of comorbid diseases, and adequate literacy were associated more assertive behavior. No access to care variable predicted assertiveness. Table 10 shows the results of the regression model predicting assertiveness. The predicted mean assertiveness score was 17.4 (SD = 1.51).

Table 10. Generalized Linear Models Predicting Patient Activation Domains (N = 9,802)

	Self-care Self-efficacy			Physician Communication			Health Information Seeking			Assertiveness		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	P Value
Social environment												
Thorough	−0.209	0.317	0.512	−1.530	0.319	0.000*	−0.842	0.408	0.045*	−0.081	0.378	0.832
Competent	−0.898	0.697	0.204	−0.154	0.756	0.839	0.465	1.033	0.655	0.801	0.829	0.336
Confident	−0.127	0.350	0.718	−1.774	0.419	0.000*	−0.167	0.455	0.714	0.217	0.393	0.583
Lacks compassion	0.277	0.428	0.519	1.554	0.381	0.000*	−0.099	0.439	0.822	0.451	0.464	0.333
Hurried care	0.533	0.156	0.001*	1.765	0.178	0.000*	−0.473	0.201	0.021*	0.357	0.237	0.134
Content knowledge	0.190	0.423	0.655	−1.737	0.353	0.000*	−0.091	0.579	0.875	−0.071	0.589	0.904
Concerned	−0.048	0.354	0.893	−1.835	0.425	0.000*	−0.051	0.535	0.924	−0.006	0.505	0.990
Married	−0.581	0.209	0.006*	0.045	0.227	0.845	−1.276	0.253	0.000*	−0.532	0.266	0.048*
Lives alone	−0.500	0.199	0.013*	−0.059	0.204	0.772	−0.453	0.283	0.112	−0.391	0.268	0.147
<i>Number of children alive (ref. > 2 children)</i>												
No children alive	0.445	0.243	0.070	0.854	0.260	0.001*	0.405	0.336	0.231	1.146	0.311	0.000*
One kid living	0.015	0.189	0.937	−0.020	0.190	0.918	−0.352	0.288	0.224	0.189	0.239	0.432
Two children living	−0.100	0.144	0.489	0.137	0.143	0.341	−0.222	0.223	0.322	−0.281	0.170	0.100
Takes helper to the doctor	0.360	0.143	0.013*	−0.304	0.150	0.044*	0.026	0.177	0.885	0.046	0.169	0.784

Table 10. Generalized Linear Models Predicting Patient Activation Domains (N = 9,802)

	Self-care Self-efficacy			Physician Communication			Health Information Seeking			Assertiveness		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	P Value
Lives in community housing	0.200	0.288	0.490	0.193	0.380	0.612	0.054	0.404	0.894	0.047	0.336	0.890
MSA	0.590	0.515	0.255	0.440	0.434	0.313	0.330	0.337	0.329	0.009	0.345	0.980
Sociodemographics												
Race/ethnicity (ref. white)												
Black	0.777	0.355	0.031*	0.721	0.327	0.029*	1.366	0.329	0.000*	−0.655	0.296	0.029*
Hispanic	0.809	0.316	0.012*	−0.192	0.299	0.523	1.330	0.578	0.023*	−0.466	0.403	0.250
Other	1.104	0.426	0.011*	0.006	0.312	0.984	0.234	0.532	0.661	−0.131	0.419	0.756
Age in years	0.045	0.009	0.000*	0.027	0.007	0.000*	−0.005	0.010	0.612	0.060	0.010	0.000*
Male	0.671	0.162	0.000*	0.695	0.131	0.000*	2.381	0.194	0.000*	0.211	0.159	0.187
Employed	0.076	0.212	0.720	−0.043	0.197	0.827	0.599	0.289	0.041*	−0.094	0.225	0.676
High school graduate	−0.757	0.176	0.000*	−0.381	0.204	0.064	−2.092	0.244	0.000*	−0.559	0.277	0.046*
Income < \$25	0.679	0.160	0.000*	0.462	0.182	0.012*	1.030	0.215	0.000*	0.811	0.198	0.000*
Physical and cognitive functioning												
Health status (ref. fair/poor)												
Excellent/very good	−0.945	0.263	0.000*	−0.877	0.200	0.000*	−0.351	0.327	0.286	−0.711	0.292	0.016*
Good	−0.073	0.219	0.739	0.008	0.163	0.959	−0.113	0.237	0.633	−0.283	0.272	0.301
Health status compared to last year (ref. worse)												

Table 10. Generalized Linear Models Predicting Patient Activation Domains (N = 9,802)

	Self-care Self-efficacy			Physician Communication			Health Information Seeking			Assertiveness		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	P Value
Better	−0.664	0.231	0.005*	−0.445	0.249	0.076	−0.528	0.355	0.140	−0.004	0.301	0.990
Same	−0.051	0.176	0.773	0.046	0.173	0.792	0.511	0.271	0.062	0.304	0.232	0.192
Number of diseases	−0.120	0.035	0.001*	−0.094	0.030	0.003*	−0.469	0.051	0.000*	−0.171	0.040	0.000*
Problems seeing	0.558	0.164	0.001*	0.382	0.154	0.015*	−0.056	0.170	0.741	0.127	0.178	0.476
Problems hearing	0.986	0.169	0.000*	0.204	0.147	0.168	0.594	0.199	0.004*	0.545	0.229	0.019*
At least 1 ADL	0.248	0.173	0.154	−0.024	0.145	0.871	0.509	0.204	0.014*	−0.424	0.215	0.051
At least 1 IADL	0.205	0.175	0.244	−0.193	0.178	0.280	0.185	0.228	0.418	0.387	0.217	0.077
Poor cognitive function	0.831	0.185	0.000*	0.211	0.173	0.224	0.870	0.247	0.001*	0.477	0.238	0.047*
Problems concentrating	1.394	0.231	0.000*	0.680	0.206	0.001*	0.671	0.291	0.023*	0.699	0.280	0.014*
Adequate literacy	−0.464	0.188	0.015*	−0.521	0.181	0.005*	−0.883	0.286	0.003*	−0.984	0.232	0.000*
Access to care												
Trouble getting care	−0.131	0.339	0.701	−0.527	0.342	0.127	−0.562	0.442	0.206	0.067	0.449	0.881
Delayed getting care	0.136	0.260	0.601	0.525	0.256	0.043*	−0.019	0.408	0.963	−0.266	0.316	0.400
Supplemental insurance (ref. public/FFS)												
Medicaid	0.976	0.308	0.002*	0.282	0.257	0.275	0.367	0.402	0.364	0.114	0.335	0.734

Table 10. Generalized Linear Models Predicting Patient Activation Domains (N = 9,802)

	Self-care Self-efficacy			Physician Communication			Health Information Seeking			Assertiveness		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>P</i> Value
HMO	0.367	0.278	0.189	−0.445	0.213	0.039*	−1.106	0.347	0.002*	−0.260	0.347	0.455
ESI	0.022	0.239	0.928	−0.735	0.221	0.001*	−1.794	0.295	0.000*	−0.458	0.288	0.115
Tricare/ Medigap	−0.094	0.219	0.669	−0.530	0.212	0.014*	−1.513	0.251	0.000*	−0.504	0.283	0.078
Constant	14.381	1.251	0.000	21.235	1.188	0.000	26.072	1.526	0.000	13.641	1.434	0.000

*Significant coefficient

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental ADL; MSA = metropolitan statistical area; ref. = reference group; SE = standard error

Overall Patient Activation Summary Score

The community social–environmental variables, community housing and urbanicity, did not predict overall PA, but 3 social support variables did. Married beneficiaries and beneficiaries who lived alone had greater levels of overall PA; the overall PA summary scores decreased by 0.580 ($p < 0.01$) points if married and by 0.332 ($p < 0.05$) points if living alone. Having no living children had a negative effect on overall PA because scores increased by 0.691 ($p < 0.001$) points. The only patient-perception-of-physician variables that were related to overall PA were hurried and thorough care. Beneficiaries receiving thorough care had higher levels of overall PA than had beneficiaries who did not think their care was thorough; their overall PA summary score decreased by 0.607 ($p < 0.05$). Hurried care negatively affected overall PA; summary scores increased by 0.519 ($p < 0.001$) points. Black beneficiaries were the only racial/ethnic minority with significantly different overall PA summary scores compared to their white counterparts. Overall PA summary scores were 0.561 points ($p < 0.05$) greater than were white scores. Although these variables had significant coefficients, the differences were not important. The MID for overall PA was 2.240 for the half-SD approach.

Several control variables had significant relationships with overall PA. Of the sociodemographic variables, increasing age, being male, and having an income of less than \$25K were associated with lower overall PA. Alternatively, beneficiaries with a high school education had greater levels of PA. Several physical and cognitive function variables also predicted overall PA. Although having vision and hearing problems, poor cognitive function, and problems concentrating were associated with less overall PA, having excellent or very good health, better health than last year, many comorbid diseases, and adequate literacy were associated with greater levels of PA. Compared to beneficiaries FFS or public insurance, beneficiaries were more activated if they had ESI or Tricare or Medigap, but were less activated if they were Medicaid recipients. Table 11 shows the results of the regression model predicting overall PA. The predicted mean overall PA score was 18.2 (SD = 1.73).

Table 11. Generalized Linear Models Predicting Overall Patient Activation (N = 9,802)

Overall PA			
	Coef.	SE	P value
Social environment			
Thorough	−0.607	0.239	0.012*
Competent	0.155	0.502	0.759
Confident	−0.496	0.271	0.075
Lacks compassion	0.522	0.280	0.066
Hurried care	0.519	0.128	0.000*
Content knowledge	−0.391	0.329	0.237
Concerned	−0.466	0.277	0.096
Married	−0.580	0.167	0.001*
Lives alone	−0.332	0.158	0.038*
<i>Number of children alive (ref. > 2 children)</i>			
No children alive	0.691	0.190	0.000*
One kid living	−0.054	0.150	0.720
Two children living	−0.115	0.114	0.317
Takes helper to the doctor	0.041	0.100	0.680
Lives in community housing	0.105	0.245	0.669
MSA	0.341	0.308	0.270
Sociodemographics			
<i>Race/ethnicity (ref. white)</i>			
Black	0.561	0.219	0.012*
Hispanic	0.349	0.223	0.120
Other	0.282	0.287	0.328
Age in years	0.032	0.006	0.000*
Male	0.975	0.103	0.000*
Employed	0.133	0.144	0.360
High school graduate	−0.953	0.165	0.000*
Income < \$25	0.741	0.130	0.000*
Physical and cognitive functioning			
<i>Health status (ref. fair/poor)</i>			
Excellent/very good	−0.732	0.176	0.000*

Table 11. Generalized Linear Models Predicting Overall Patient Activation (N = 9,802)

Overall PA			
	Coef.	SE	P value
Good	−0.129	0.150	0.391
<i>Health status compared to last year (ref. worse)</i>			
Better	−0.421	0.197	0.035*
Same	0.197	0.148	0.187
Number of diseases	−0.213	0.026	0.000*
Problems seeing	0.239	0.112	0.035*
Problems hearing	0.579	0.119	0.000*
At least 1 ADL	0.103	0.124	0.407
At least 1 IADL	0.145	0.136	0.288
Poor cognitive function	0.610	0.143	0.000*
Problems concentrating	0.874	0.160	0.000*
Adequate literacy	−0.695	0.153	0.000*
<i>Access to care</i>			
Trouble getting care	−0.262	0.266	0.326
Delayed getting care	0.059	0.206	0.776
<i>Supplemental insurance (ref. public/FFS)</i>			
Medicaid	0.433	0.205	0.037*
HMO	−0.355	0.204	0.084
ESI	−0.730	0.173	0.000*
Tricare/Medigap	−0.648	0.154	0.000*
Constant	18.634	0.988	0.000

*Significant coefficient

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; PA = patient activation; ref. = reference group; SE = standard error

Summary of Aim 1 Hypotheses

As a whole, the social–environmental variables collectively influenced each PA domain and overall PA. When looking at the individual groups of social–environmental variables, I found that the community variables did not collectively predict PA at all. The social support variables collectively influenced all the PA domains and overall PA. As a group, the patient-perception-of-physician variables

collectively influenced self-care self-efficacy, physician communication, and overall PA. The individual variable influences are discussed below.

Self-care Self-efficacy

Only a few social environmental variables individually influenced self-care self-efficacy. Based on the relationships mentioned in the Social Network model, the Social Cognitive Theory and a couple of studies that measured social support with scales,^{61, 65, 67, 68} I hypothesized that the social support variables would increase self-care self-efficacy. As hypothesized, marriage was associated with better self-care self-efficacy. My results are consistent with past literature although the types of self-efficacy studied are different. Blustein also found of a positive relationship between marriage and cardiovascular self-efficacy.⁶⁶ These results extend the literature by examining marriage and another form of self-efficacy. Living alone was associated with better self-care self-efficacy; however, the direction of this relationship was unexpected because I associated living alone with a lack of social support. I initially thought that taking a helper to a visit would increase self-care self-efficacy. Contrary to my hypothesis, it decreased self-care self-efficacy. The type of support helpers provide might explain why the result was opposite of what was expected. Helpers might provide instrumental, emotional, or even informational support, instead of appraisal support. In addition, a helper's role might be limited to the visit and not during other times of a patient's life when self-care self-efficacy might truly be exercised. Unfortunately, no other examples exist in the literature of models where taking a helper to the doctor predicts self-care self-efficacy to which one can compare these results. Once again, new information was generated from the relationships observed here.

Hurried care was the only patient-perception-of-physician variable that predicted self-care self-efficacy. In one study emphatic and attentive communication was associated with higher levels of self-efficacy.⁸⁰ Therefore, I hypothesized that positive perceptions of physicians would be associated with higher self-care self-efficacy and negative perception with lower self-care self-efficacy. As predicted,

beneficiaries who received hurried care had lower levels of self-care self-efficacy.

Although MSA was not predictive of self-care self-efficacy here, self-efficacy has varied by neighborhood.⁶² In addition, the Social Network model proposes that housing effects self-efficacy;⁶¹ however, no relationship between housing and self-efficacy was observed in this study. It is possible that characteristics of a community would be more sensitive to self-care self-efficacy. It is also possible that community variables are too distal from self-efficacy to have an impact.

Physician Communication

I hypothesized that none of the social support variables would be associated with physician communication except having a helper at a doctor visit, because I assumed that an additional person present during an examination might influence more communication than what might occur without an additional person present.⁷⁰ This hypothesis was further supported by 2 studies that found marriage was not associated with physician communication.^{63, 71} The results showed taking a helper to the doctor was associated with better physician communication and marriage did not predict physician communication. Contrary to my hypothesis, number of living children predicted physician communication. Children might encourage beneficiaries to speak up at visits, which in turn might cause physicians to communicate better.⁹⁸

I hypothesized that positive perceptions of a physician would be associated with better physician communication and negative perceptions with worse physician communication. All of the patient perception-of-physician variables predicted physician communication except competence. As hypothesized, hurried care and a lack of compassion negatively affected physician communication. Epstein also found PCC declined when visits were short.⁸¹ Thorough care, confidence, concern, and content knowledge were associated with better physician communication as hypothesized. The relationships with the remaining patient-perception-of-physician variables and physician communication have not been studied directly; we only know that trust, which is highly correlated with the perception

variables, is positively associated with physician communication^{69, 79} These results provide new information because the patient-perception-of-physician variables were strong predictors of physician communication. Like Sleath's work, physician communication did not vary by MSA as predicted.⁶³

Health Information Seeking

Because social networks, social support, and family were associated with more information seeking^{64, 70, 101, 103} I hypothesized that the social support variables would be associated with health information seeking here. In this study, only marriage increased the odds of health information seeking. This result is inconsistent with the health information literature where no relationship was found^{64, 76} and the shared-decision-making literature where a negative relationship was observed.^{72, 76} Differing populations and measures of information seeking might explain why the results do not agree. Ende's study measured preference for information seeking and not actual seeking⁷⁶ and Czaja studied information seeking in cancer patients.⁶⁴ In addition, Arora was studying shared decision making.⁷² Contrary to previous work showing family increased health information seeking¹⁰⁶ and decreased shared decision making,⁷⁴ in this study the number of living children had no effect on health information seeking. It is possible that the relationships cancel each other out because the new health-information-seeking domain is a combination of items from the health information-seeking and shared-decision-making domains proposed by Williams and Heller. Lastly like Czaja, I found no relationship between taking a helper to the doctor and information seeking.⁶⁴ In the shared decision making literature 1 study found a positive relationship,⁷⁴ while another found a negative relationship.⁷⁵

Among the patient-perception-of-physician variables, hurried and thorough care were associated health information seeking. I hypothesized that hurried care would have a positive effect on health information seeking and it did. This result was consistent with a previous study that found nonseekers felt their physicians spent enough time with them.⁸⁶ I also found that thorough care increased health information seeking; however, I predicted that it would negatively affect health

information seeking. Although no relationship was observed between a lack of compassion and health information seeking in this study, showing respect to patients decreased information seeking in another study.⁸⁶ Unfortunately, very few direct comparison of relationships existed between health information seeking and the patient-perception-of-physician variables. Like Czaja, I found no relationship between MSA and information seeking.⁶⁴

Assertiveness

Very few variables predicted assertiveness, possibly because of the poor reliability of this domain. As hypothesized, married beneficiaries were more assertive and beneficiaries with no children were less assertive. Past studies that predicted assertiveness did not study these relationships directly; however, they are consistent with results that show that social support is associated with less assertiveness.⁷³

None of the patient-perception-of-physician variables predicted assertiveness; however, a study examining determinants of leaving a physician practice found that, if the relationship between patients and physicians was positive, patients were less likely to leave the practice.⁸⁵ Another study found that patients were less likely to switch physicians if the physician had good knowledge of the patient and if visits were not rushed.⁷³ The fact that none of these variables predicted assertiveness might be due to differences in the populations studied and that the assertiveness domain also contains an item regarding disagreeing with one's physician.

Overall Patient Activation

There are no direct comparisons of the relationship between any of the social–environmental variables and overall PA in the literature. We only know that actual measures of social support are related to increased activation.^{31, 38} My results were consistent with past literature to an extent because being married, living alone, and having living children were associated with better overall PA. As with self-care self-efficacy, the direction of the relationship between living alone and overall PA was

unexpected; beneficiaries who lived alone were more activated.

The only patient-perception-of-physician variables associated with overall PA were hurried care and thorough care. As predicted, thorough care was associated with better PA and hurried care had a negative effect on PA. The literature lacks studies that have assessed the relationship between PA and patient perceptions of physicians. The examples we have show trust is associated with increased activation;^{31, 38} patients' perception of physician are highly correlated with trust.⁷⁹ The link between trust and patients' perception of physicians might explain this relationship observed in this study.

Racial/Ethnic Differences

Racial/ethnic differences were observed in all of the PA domains and overall PA. After controlling for all other variables, blacks consistently had lower levels of self-care self-efficacy, physician communication, health information seeking, and overall PA scores compared to whites; however, they had higher levels of assertiveness. Whereas, Hispanics beneficiaries only had lower levels of self-care self-efficacy compared to white beneficiaries.

Past literature is mixed regarding variations in PA domains and overall PA by race/ethnicity. Although several studies found no differences in self-efficacy,⁹⁵ physician communication,^{63, 98} assertiveness,⁷³ shared decision making,^{72, 76, 100} and health information seeking,⁷⁶ others found that blacks have lower self-efficacy,⁶⁶ physician communication,^{71, 97} and more assertiveness,⁸⁵ as seen in this study, and that minority patients are involved in less shared decision making.⁸³ Blacks have also been documented to have lower levels of overall PA.³¹ In this study, Hispanic beneficiaries only had lower self-efficacy than whites; however, in past literature, Hispanics have had lower self-efficacy,⁶⁶ physician communication,⁹⁷ and health information seeking compared to whites.⁸⁶

Summary

Very few social–environmental variables predicted PA. Between the three classes of social–environmental variables, social support was the most consistent predictor of all PA domains and overall PA. In particular being married was associated with greater activation in all domains except for physician communication. Similarly, hurried care was the most consistent patient-perception-of-physician variable that predicted multiple PA domains and overall PA. Community social–environmental variables were not associated with PA. The physician-communication domain had the most predictors, as all but 1 patient-perception-of-physician variable predicted it. For the most part these results were consistent with past literature; however, in many cases, the social–environmental variables were studied in relation to PA domains and overall PA for the first time. Therefore, in addition to identifying potential targets to improve PA, new information has been added to the literature.

Aim 2: To Examine the Association between PA and Information-seeking Behavior of Medicare Beneficiaries Considering Medicare Part D enrollment

Table 12 contains the Aim 2 sample characteristics. I studied 6,434 respondents for this aim. The sample size is smaller than the sample in Aim 1 because a quarter of the sample was retired with the 2004 MCBS sample. This sample represents approximately 15.5 million Medicare beneficiaries. The mean age of the respondent was 72.9 years, 41.4% were male, 80.1% were white, 74.7% were high school graduates, 55.9% had incomes less than \$25,000, 60.8% had adequate literacy, and 15.3% were dually eligible for Medicaid. Beneficiaries had approximately 4 comorbid conditions. Almost 3 quarters experienced at least 1 ADL and just under 1 quarter of beneficiaries had cognitive or mental impairment. The mean PA scores were 16.9 (SE = 0.18), 16.2 (SE = 0.15), 17.3 (SE = 0.15), and 22.0 (SE = 0.16) for the self-care self-efficacy, physician communication, assertiveness, and health information-seeking domains, respectively. The overall PA summary score was 18.1 (SE = 0.13).

The majority of respondents (70.1%) had some form of drug coverage in 2005, but only 14.7%

used a medication discount cards. Although just over half of the patients were able to find low or no-cost medications by asking for generic drugs and samples, far fewer respondents (22.8%) compared drug prices. Very few of the respondents (3.9%) did not fill medications; however, approximately 10% of patients took less medication than prescribed or skipped doses. Approximately 70% of respondents were aware of Medicare Part D and the Medicare prescription discount cards in 2004. Only 12.8% of respondents reported needing information about Medicare Part D more than other Medicare information. When it came to looking for information about Medicare Part D, only 34.8% looked for information about Medicare Part D. Two thirds of beneficiaries preferred to receive Medicare information through brochures.

Table 12. Characteristics of the Aim 2 Sample

Variables	Total (N = 6,434)
Demographics	
<i>Race/ethnicity</i>	
White	80.10%
Black	9.10%
Hispanic	7.10%
Age in years (SE)	72.9 (0.14)
Male	41.40%
High school grad	74.70%
Income < \$25K	55.90%
Employed	10.60%
Married	54.10%
MSA	74.80%
Physical and cognitive functioning	
<i>Health status</i>	
Excellent/very good	42.50%
Good	32.80%
Fair/poor	24.70%
<i>Health compared to last year</i>	

Table 12. Characteristics of the Aim 2 Sample

Variables	Total (N = 6,434)
Better	15.80%
Same	63.30%
Worse	21.00%
Difficulty seeing	28.30%
Difficulty hearing	32.10%
Problem with sight prevent learning about Medicare	8.20%
Problem with hearing prevent learning about Medicare	6.30%
Total number of disease (SE)	3.9 (0.04)
No IADL	56.00%
No ADL	72.30%
Poor cognitive functioning	23.30%
Trouble concentrating	11.10%
Makes own insurance decision	66.20%
Access to care	
Trouble or delayed getting care	7.70%
<i>Supplemental insurance</i>	
Medicaid	15.30%
HMO	15.10%
ESI	34.80%
Tricare/self-pay	26.00%
Public/FFS	8.80%
PA domain	
Mean self-care self-efficacy (SE)	16.9 (0.18)
Mean physician communication (SE)	16.2 (0.15)
Mean health information seeking (SE)	22.0 (0.16)
Mean assertiveness (SE)	17.3 (0.15)
Mean PA summary score (SE)	18.1 (0.13)
Need	
Need prescription drug coverage info	12.80%
Access to information	

Table 12. Characteristics of the Aim 2 Sample

Variables	Total (N = 6,434)
Adequate literacy	60.80%
Access to the Internet	45.20%
Access to prescription drugs	
Has not filled medications	3.90%
Uses mail order pharmacy	31.70%
Gets medications from outside of the United States	6.70%
Asks for generic medications	53.20%
Uses samples	51.90%
Takes a smaller dose than prescribed	10.10%
Compares drug prices	22.80%
Has skipped doses	9.30%
Had Rx coverage in 2005	70.10%
Rx discount card	14.70%
Medicare Rx discount card	4.60%
Prior knowledge	
Medicare discount card	70.20%
Medicare Part D	70.00%
Information channel preferences	
Taking with others	44.90%
Using a brochure	67.20%
Internet	9.80%
Media	38.80%
Mean number of channels (SE)	1.6 (0.04)
Preference count	
Zero	11.90%
One	35.40%
Two	34.50%
Three	16.40%
Four	1.90%

ADL = activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service;
HMO = health maintenance organization; IADL = instrumental ADL;
MSA = metropolitan statistical area; PA = patient activation; SE = standard error

As in Aim 1, Pearson correlations were calculated for control variables used in Aim 2. Appendix D presents the Pearson correlations. The bivariate relationships with the predictor variables and information seeking and nonpreferred information channel use will be discussed in subsequent sections. Because many of the control variables from Aim 1 were also used in Aim 2, the discussion below is limited to correlations with the new variables. Many of the relationships were not strong. Beneficiaries who reported vision problems were more likely to report that their vision prevented them from learning about Medicare ($r = 0.468, p < 0.05$). Those with hearing problems were more likely to report that their hearing prevented them from learning about Medicare ($r = 0.381, p < 0.05$). Beneficiaries who had problems learning about Medicare because of their sight also had problems learning about Medicare because of their hearing. Knowledge of Medicare discount cards was positively correlated with knowledge of Medicare Part D in 2004 ($r = 0.466, p < 0.001$). Beneficiaries with multiple information channel preferences used multiple information sources ($r = 0.223, p < 0.05$).

Beneficiaries who had trouble getting care or who delayed care were more likely to report taking smaller doses ($r = 0.230, p < 0.05$) and skipping doses ($r = 0.242, p < 0.05$). Having ESI was positively correlated with having prescription drug coverage in 2005 ($r = 0.317, p < 0.05$) and using mail order pharmacies ($r = 0.248, p < 0.05$). Having Tricare was associated with not having prescription drug coverage in 2005 ($r = -0.313, p < 0.05$).

Using mail order pharmacies was positively correlated with getting medication from outside the United States ($r = 0.294, p < 0.05$). Getting medications from outside the United States was strongly correlated with comparing drug prices ($r = 0.364, p < 0.05$), taking a smaller dose than prescribed ($r = 0.338, p < 0.05$), and skipping doses ($r = 0.344, p < 0.05$). Asking for generic medications was positively correlated with using samples ($r = 0.274, p < 0.05$) and comparing drug prices ($r = 0.310, p < 0.05$). Beneficiaries who used samples were more likely to compare drug prices ($r = 0.314,$

$p < 0.05$), take smaller doses than prescribed ($r = 0.213$, $p < 0.05$), and skip doses ($r = 0.211$, $p < 0.05$). Beneficiaries who took smaller doses than prescribed were more likely to compare drug prices ($r = 0.274$, $p < 0.05$) and extremely likely to skip doses ($r = 0.797$, $p < 0.001$). Comparing drug prices was positively correlated with skipping doses ($r = 0.278$, $p < 0.05$).

In the following sections, the bivariate statistics and regression model results are presented by study outcome. I will start first with predicting the likelihood of seeking Medicare Part D information, followed by an assessment of the number of sources of information used, and finish with an analysis of the use of a nonpreferred information channels when learning about Medicare Part D.

Medicare Part D Information Seeking

As mentioned earlier, only 38.4% of Medicare beneficiaries looked for information about Medicare Part D. There were many significant relationships observed between information seeking and the variables of interest (ie, PA and race) as well as the control variables. These relationships are summarized in Table 13. Patient activation domain scores differed by seeking status; Medicare Part D information seekers reported better physician communication, health information seeking, assertiveness, and overall PA compared to nonseekers. Nevertheless, significant differences in scores were too small to be considered important. There were also racial/ethnic differences. Blacks were more likely to be nonseekers (7.7% vs. 9.9%), while white beneficiaries were more likely to be information seekers (83.1% vs. 78.3%). The proportion of Hispanic information seekers and nonseekers did not differ.

Many of the control variables varied by information-seeking status. Among the sociodemographics variables, gender, employment, and MSA were associated with being a nonseeker. The information behavior variables also varied by information-seeking status. Stating a need for Medicare Part D information was more than 2 times greater in seekers. Information seekers were more likely to have prior knowledge or awareness of Medicare Part D, access to the Internet, and adequate

literacy compared to nonseekers. Information seekers were more likely to have issues about access to prescription drugs, and were more likely to exhibit noncompliance behaviors related to costs.

Information seekers tended to have more information channel preferences than nonseekers.

Information seekers were more likely to prefer the media information channel, whereas nonseekers preferred talking with others, and using brochures or the Internet.

Physical and cognitive functioning also varied across cohorts. Medicare Part D information seekers were more likely to report better or worse health, hearing and sight problems, and poor cognitive function than nonseekers. They were less likely to have the same health as the last year, have no IADLs, and have made their own insurance decisions compared to nonseekers. Lastly, access to care varied by information-seeking status. Information seekers were more likely to have trouble or delayed getting care and were more likely to be insured through Tricare or Medigap plans, while nonseekers were more likely to be enrolled in HMO or ESI.

Table 13. Differences in Characteristics between Seekers and Nonseekers (N = 6,434)

	Seeker N = 2,467	Nonseeker N = 3,967	p Associated with t Test
PA domain			
Mean SCSE (SE)	16.7 (0.17)	17.1 (0.21)	0.06
Mean PC (SE)	16.0 (0.15)	16.4 (0.21)*	0.01
Mean HIS (SE)	21.1 (0.20)	22.5 (0.20)*	0.00
Mean assertiveness (SE)	16.8 (0.18)	17.5 (0.18)*	0.00
Mean overall PA summary score (SE)	17.6 (0.13)	18.4 (0.15)*	0.00
Demographics			
<i>Race/ethnicity</i>			
White	83.1%	78.2%*	0.00
Black	7.7%	9.9%*	0.01
Hispanic	6.5%	7.4%	0.15
Age in years (SE)	72.3 (0.24)	73.3 (0.19)	0.00
Male	39.7%	42.5%*	0.03

Table 13. Differences in Characteristics between Seekers and Nonseekers (N = 6,434)

	Seeker N = 2,467	Nonseeker N = 3,967	p Associated with t Test
High school grad	75.8%	74.0%	0.16
Income < \$25K	56.6%	55.5%	0.47
Employed	12.7%	9.3%*	0.00
Married	55.6%	53.1%	0.14
MSA	71.0%	77.2%*	0.02
Need			
Need prescription drug coverage info	20.5%	8.1%*	0.00
Access to information			
Adequate literacy	62.7%	59.6%*	0.03
Access to the Internet	50.6%	41.9%*	0.00
Access to prescription drugs			
Has not filled medications	6.0%	2.6%*	0.00
Uses mail order pharmacy	29.6%	33.0%*	0.04
Gets medications from outside of the United States	8.6%	5.5%*	0.00
Asks for generic medications	60.0%	49.0%*	0.00
Uses samples	60.6%	46.4%*	0.00
Takes a smaller dose than prescribed	12.3%	8.7%*	0.00
Compares drug prices	30.9%	17.8%*	0.00
Has skipped doses	11.5%	8.0%*	0.00
Had Rx coverage in 2005	59.6%	76.7%*	0.00
Rx discount card	23.5%	9.3%*	0.00
Medicare Rx discount card	7.7%	2.6%*	0.00
Prior knowledge			
Medicare discount card	74.8%	67.4%*	0.00
Medicare Part D	76.8%	65.7%*	0.00
Information channel preferences			
Taking with others	40.7%	51.6%*	0.00
Using a brochure	62.5%	74.5%*	0.00
Internet	7.1%	14.1%*	0.00
Media	44.0%	35.6%*	0.00
Mean number of channels (SE)	1.8 (0.04)	1.5 (0.04)*	0.00

Table 13. Differences in Characteristics between Seekers and Nonseekers (N = 6,434)

	Seeker N = 2,467	Nonseeker N = 3,967	p Associated with t Test
<i>Preference count</i>			
Zero	4.9%	16.2%*	0.00
One	32.4%	37.2%*	0.00
Two	38.8%	31.8%*	0.00
Three	20.9%	13.6%*	0.00
Four	2.9%	1.2%*	0.00
<i>Physical and cognitive functioning</i>			
<i>Health status</i>			
Excellent/very good	41.1%	43.4%	0.13
Good	33.7%	32.2%	0.23
Fair/poor	25.2%	24.4%	0.53
<i>Health compared to last year</i>			
Better	17.9%	14.4%*	0.00
Same	59.7%	65.5%*	0.00
Worse	22.4%	20.0%*	0.04
Difficulty seeing	31.0%	26.6%*	0.00
Difficulty hearing	35.6%	30.0%*	0.00
Problem with sight prevent learning about Medicare	8.9%	7.8%	0.16
Problem with hearing prevent learning about Medicare	6.9%	6.0%	0.18
Total number of disease	4.1	3.8*	0.00
No IADL	53.4%	57.6%*	0.01
No ADL	70.8%	73.3%	0.07
Poor cognitive functioning	25.5%	22.0%*	0.00
Trouble concentrating	11.4%	10.9%	0.59
Makes own insurance decision	64.0%	67.6%*	0.03
<i>Access to care</i>			
Trouble or delayed getting care	10.0%	6.3%*	0.00
<i>Supplemental insurance</i>			
Medicaid	15.3%	15.3%	0.96
HMO	12.0%	17.0%*	0.00
ESI	27.9%	39.1%*	0.00

Table 13. Differences in Characteristics between Seekers and Nonseekers (N = 6,434)

	Seeker N = 2,467	Nonseeker N = 3,967	p Associated with t Test
Tricare/self-pay	34.8%	20.6%*	0.00
Public/FFS	10.0%	8.0%	0.08

*p value < 0.05

ADL = activities of daily living; IADL = instrumental activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; Rx = prescription drug; SCSE = self-care self-efficacy

Regression Analyses

Two logistic regression models were used to predict Medicare Part D information seeking; 1 included all the individual PA domains and the other included the overall PA summary score. Despite the assertiveness domain having poor internal consistency, it was included in the logistic regression model with the other PA domains. The predicted probability of seeking Medicare Part D information was 0.386 in both models.

Table 14 contains the logistic regression model results. Many of the bivariate relationship observed with the PA domains and seeking status were no longer observed in the multivariate analysis. The health information-seeking PA domain was the only PA domain that predicted Medicare Part D information seeking (OR = 0.98, $p < 0.001$). As the health information-seeking scores increased (poorer activation), the probability of seeking Medicare Part D information decreased. If scores increased by the MID (4.555 points) the odds of seeking would be 0.91, and if scores decreased by the MID, information seeking would increase by 10% (OR = 1.10). Only beneficiaries of other races had lower odds of seeking Medicare Part D information compared to white beneficiaries (OR = 0.59, $p < 0.01$). In the model with the overall PA, increasing scores (poorer PA) was associated with a lower odd of seeking Medicare Part D information (OR = 0.97, $p < 0.001$). If scores increased by the MID (2.240 points) the odds of seeking would decrease by a factor of 0.96. A decrease in the overall PA score by the MID would result in an increase in odds of 1.05. Similar to the PA domain-based model,

beneficiaries of other races had approximately 40% lower odds of seeking Medicare Part D information.

Several control variables had significant relationships with Medicare Part D information seeking. The relationships and magnitude of effect of the control variables were virtually the same across the models containing PA domain scores and the overall PA summary score. For instance, need for Medicare Part D information had the strongest relationship with seeking information than any other variable in either model. The odds of seeking Medicare Part D information were 2.49 times ($p < 0.001$) greater in the domain-based model and 2.50 times ($p < 0.001$) greater in the overall PA based model. The odds of seeking Medicare Part D information increased if beneficiaries had access to the Internet and prior knowledge or awareness of Medicare Part D. Many of the access to prescription medication variables were associated with Medicare Part D information seeking. Beneficiaries who used prescription discount cards did not fill a medication, used drug samples, and compared drug prices had a higher odds of information seeking, while beneficiaries with prescription drug coverage in 2005 or who filled their medications at mail order pharmacies had a lower odds of seeking Medicare Part D information. The odds of seeking information increased if a beneficiary was employed. Age was only a predictor of information seeking in the domain-based model; as beneficiaries aged, they were less likely to seek information. Very few physical and cognitive function variables predicted information seeking. The odds of seeking information increased if a beneficiary reported good health, had more comorbidities, and had hearing problems. Lastly, 2 access to care variables were associated with seeking Medicare Part D information. Delaying or not getting needed care and being enrolled in Tricare or Medigap plans increased the odds of information seeking.

The results were also interpreted according to marginal effects. For every 1 point increase in health information scores, the probability of seeking decreased by 0.005 (SE = 0.001). If overall PA scores increased by 1 point the probability of Medicare Part D information seeking decreased by 0.007 (SE = 0.002). Stating a need for Medicare Part D information had the largest impact on whether or not

a beneficiary sought Medicare Part D information in both models. The probability of seeking was approximately 0.223 (SE = 0.023) higher among beneficiaries who knew they needed information about Medicare Part D.

Table 14. Logistic Regression Models Predicting Medicare Part D Information Seeking (N = 6,434)

	Model with PA Domains			Model with PA Summary Score		
	OR	95% CI	p Value	OR	95% CI	p Value
PA domains						
SCSE	1.00	[0.99, 1.02]	0.438			
PC	1.00	[0.98, 1.01]	0.783			
HIS	0.98	[0.97, 0.99]	0.000*			
Assertiveness	0.99	[0.98, 1.00]	0.074			
PA summary score				0.97	[0.95, 0.98]	0.000*
Sociodemographics						
<i>Race/ethnicity (ref. white)</i>						
Black	0.84	[0.65, 1.08]	0.172	0.84	[0.65, 1.07]	0.157
Hispanic	1.01	[0.78, 1.30]	0.965	1.00	[0.77, 1.29]	0.978
Other	0.59	[0.42, 0.83]	0.003*	0.60	[0.43, 0.83]	0.003*
Age in years	0.99	[0.99, 1.00]	0.045*	0.99	[0.99, 1.00]	0.081
Male	0.90	[0.79, 1.03]	0.118	0.89	[0.78, 1.01]	0.063
Employed	1.40	[1.14, 1.73]	0.002*	1.39	[1.13, 1.72]	0.002*
High school graduate	0.97	[0.82, 1.15]	0.739	0.99	[0.84, 1.16]	0.901
Income < \$25	1.03	[0.89, 1.19]	0.693	1.02	[0.89, 1.18]	0.746
Married	1.08	[0.92, 1.26]	0.352	1.09	[0.93, 1.27]	0.286
MSA	0.86	[0.67, 1.10]	0.227	0.86	[0.68, 1.11]	0.245
Physical and cognitive functioning						
<i>Health status (ref. fair/poor)</i>						
Excellent/very good	1.10	[0.92, 1.32]	0.310	1.08	[0.90, 1.29]	0.422
Good	1.19	[1.02, 1.39]	0.032*	1.18	[1.01, 1.38]	0.040*
<i>Health status compared to last year (ref. worse)</i>						
Better	1.10	[0.91, 1.33]	0.328	1.10	[0.91, 1.34]	0.303
Same	0.94	[0.82, 1.08]	0.372	0.94	[0.82, 1.08]	0.377
Number of disease	1.05	[1.01, 1.08]	0.004*	1.05	[1.02, 1.08]	0.002*

Table 14. Logistic Regression Models Predicting Medicare Part D Information Seeking (N = 6,434)

	Model with PA Domains			Model with PA Summary Score		
	OR	95% CI	p Value	OR	95% CI	p Value
Problems seeing	1.16	[0.98, 1.36]	0.084	1.16	[0.97, 1.37]	0.073
Problems hearing	1.28	[1.11, 1.49]	0.001*	1.29	[1.12, 1.50]	0.001*
Seeing causes problems learning about Medicare	0.99	[0.78, 1.26]	0.937	0.99	[0.78, 1.25]	0.942
Hearing causes problems learning about Medicare	0.92	[0.71, 1.21]	0.557	0.93	[0.71, 1.21]	0.592
ADL	0.98	[0.84, 1.15]	0.812	0.98	[0.83, 1.14]	0.767
IADL	1.04	[0.91, 1.19]	0.519	1.05	[0.92, 1.19]	0.500
Poor cognitive function	1.00	[0.87, 1.15]	0.987	1.00	[0.87, 1.15]	0.985
Problems concentrating	0.84	[0.70, 1.01]	0.058	0.85	[0.71, 1.02]	0.082
Makes own insurance decisions	0.88	[0.76, 1.01]	0.062	0.88	[0.76, 1.01]	0.075
Access to information						
Has Internet access	1.38	[1.20, 1.60]	0.000*	1.39	[1.20, 1.60]	0.000*
Adequate literacy	1.09	[0.94, 1.27]	0.266	1.09	[0.94, 1.27]	0.252
Need						
Needed information about Medicare Part D	2.49	[2.06, 3.02]	0.000*	2.50	[2.07, 3.02]	0.000*
Prior knowledge						
Discount card	1.08	[0.90, 1.30]	0.413	1.08	[0.90, 1.30]	0.426
Medicare Part D	1.52	[1.28, 1.81]	0.000*	1.51	[1.27, 1.79]	0.000*
Access to prescription drugs						
Rx coverage 2005	0.71	[0.59, 0.85]	0.000*	0.71	[0.59, 0.86]	0.000*
Rx discount card	1.94	[1.62, 2.33]	0.000*	1.95	[1.63, 2.33]	0.000*
Did not fill need medication	1.79	[1.35, 2.38]	0.000*	1.78	[1.34, 2.36]	0.000*
Uses mail order pharmacy	0.76	[0.66, 0.89]	0.001*	0.77	[0.66, 0.89]	0.001*
Gets medications from outside of the United States	1.01	[0.73, 1.38]	0.972	1.01	[0.73, 1.40]	0.933
Asks for generic medications	1.12	[0.96, 1.31]	0.160	1.13	[0.96, 1.32]	0.133
Uses samples	1.31	[1.12, 1.54]	0.001*	1.32	[1.12, 1.54]	0.001*
Takes a smaller dose than prescribed	0.98	[0.70, 1.36]	0.888	0.97	[0.69, 1.35]	0.842
Compares drug prices	1.42	[1.18, 1.70]	0.000*	1.42	[1.18, 1.70]	0.000*

Table 14. Logistic Regression Models Predicting Medicare Part D Information Seeking (N = 6,434)

	Model with PA Domains			Model with PA Summary Score		
	OR	95% CI	p Value	OR	95% CI	p Value
Skips doses	1.03	[0.74, 1.43]	0.848	1.05	[0.76, 1.46]	0.762
Access to care						
Had trouble or delayed getting care	1.26	[1.02, 1.56]	0.034*	1.27	[1.03, 1.58]	0.028*
Supplemental insurance						
Medicaid	1.24	[0.94, 1.63]	0.124	1.25	[0.95, 1.64]	0.108
HMO	0.79	[0.57, 1.08]	0.131	0.80	[0.58, 1.09]	0.154
ESI	0.81	[0.58, 1.13]	0.211	0.82	[0.59, 1.14]	0.244
Tricare/Medigap	1.30	[1.01, 1.69]	0.045*	1.32	[1.02, 1.71]	0.036*

*p value < 0.05

ADL = activities of daily living; CI = confidence interval; ESI = employer sponsored insurance; HIS = health information seeking; HMO = Health maintenance organization; IADL = instrumental activities of daily life; N = number; PA = patient activation; PC = patient communication; OR = odds ratio; ref. = reference group; SCSE = self-care self-efficacy

Information Source Count

Beneficiaries who sought Medicare Part D information used many different information sources. The most common sources used by seekers were Medigap plans, Medicare publications, and pharmacies as shown in Table 15.

Table 15. Frequency of Use of Information Sources by Seekers

Information Source	Percent (N = 2,467)
Counselor	8.7%
Current or former employer	2.1%
Family and friends	12.9%
Other government agency	2.2%
Insurance company	7.7%
Internet	5.1%
Medicare advantage plan	6.3%
Media	11.4%
Medicare, including hotline	14.8%
Medigap	22.3%

Table 15. Frequency of Use of Information Sources by Seekers

Information Source	Percent (N = 2,467)
Health care provider	5.3%
Medicare publications	26.0%
Other source	1.5%
Pharmacy	22.5%
AARP/senior organization	12.0%
SSA office	3.9%
State Medicaid office	1.7%
Medicare.gov	7.1%
Mean information source count (SE)	1.7 (0.03)

AARP = American Association of Retired People; SE = standard error; SSA = Social Security Administration

Information seekers used an average of 1.7 (0.03) information sources. The frequency of the number of sources used is provided in Figure 5. Many beneficiaries had zero counts because many people did not seek (31.6%). However, an extremely small number of beneficiaries sought information, but could not find it (n = 51).

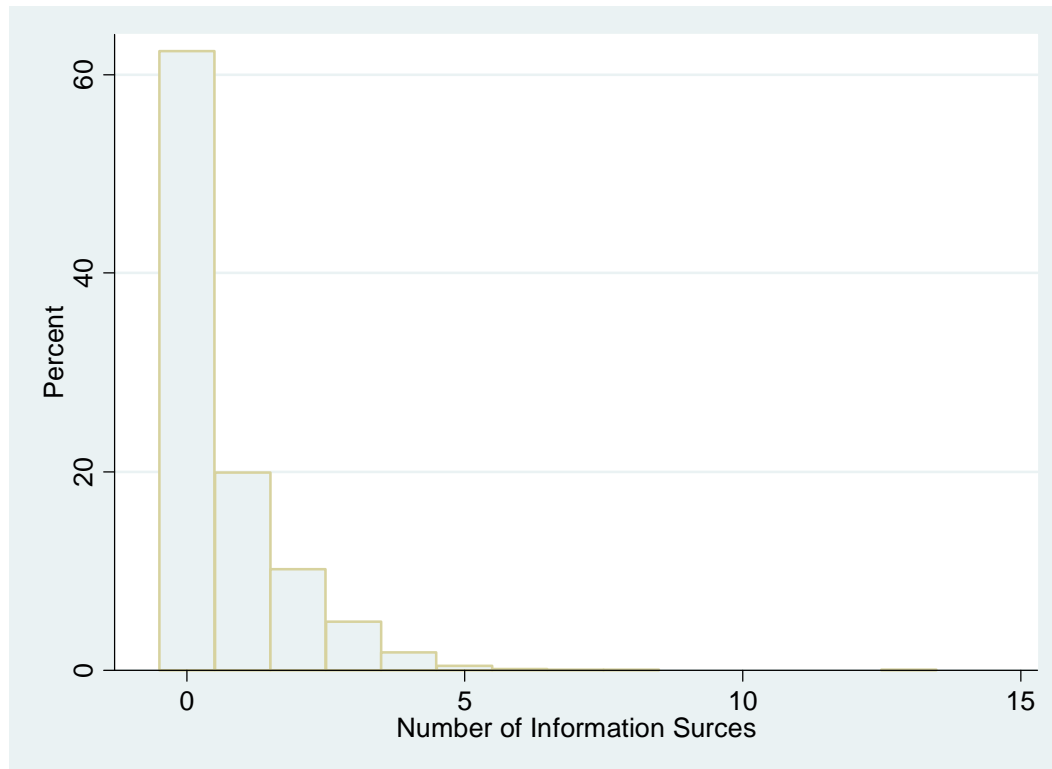


Figure 5. Frequency of information Sources used to learn about Medicare Part D.

Regression Analyses

After comparing Poisson, negative binomial, ZIP, and ZINB regression models, with likelihood ratio and Vuong tests, a ZINB was the most appropriate model to predict number of sources of information used to learn about Medicare Part D because there were excess zeros and overdispersion. The results of the ZINB are found in Table 16. Two models were predicted, 1 model with the individual PA domains and 1 model with the overall PA score. The expected number of sources used was 0.614 and 0.621 for the domain based and overall PA models, respectively. The probability of using 1 information source was 0.227. It decreased to 0.092 for 2 sources. The probability of using 3 sources was even less likely (0.037).

Despite the health information-seeking and assertiveness domains predicting the number of information sources used to learn about Medicare Part D, the effect was extremely small. As scores

increased (lower PA) the number of information sources used decreased. The coefficients on health information seeking and assertiveness are -0.014 ($p < 0.001$) and -0.006 ($p < 0.05$), respectively. If health-information-seeking and assertiveness scores changed by a half-SD, the number of information sources used would change by 0.068 and 0.023, respectively. Similarly, the number of information sources declined as the overall PA summary score increased (coef. = -0.023 , $p < 0.001$). For a half-SD change in the overall PA summary score, the number of sources of information would change by 0.064. In the PA domain model, black beneficiaries and beneficiaries of *Other* races used less information sources than did their white counterparts; the discrete change in number of information sources was 0.120 and 0.182, respectively. The magnitude of effect was very similar in the overall PA model as seen in Table 16.

Several control variables were predictors of information source count. In the PA domain model, employed and married beneficiaries used more information sources than did unemployed and single beneficiaries. Of the information behavior related variables, beneficiaries who stated they needed information, had access to the Internet, had prior knowledge of the Medicare Part D program, and had many information channel preferences used more information sources. Access to prescription medication variables were also associated with the number of sources of information used by beneficiaries. More information sources were used if beneficiaries used prescription discount cards, did not fill a needed medication, got their medication outside the United States, asked for generic medications, used drug samples, and compared drug prices. Beneficiaries with prescription drug coverage in 2005 used fewer information sources than did beneficiaries without coverage. Very few physical and cognitive function variables predicted the number of sources of information used by beneficiaries. Having good health, an increasing number of comorbid conditions, and problems seeing were associated with using more information sources. Beneficiaries enrolled in Tricare or Medigap used more information sources than did beneficiaries with FFS or public insurance. In addition to each

relationship observed in the PA domain model, males and beneficiaries with the same health compared to the last year used less information sources in the overall PA model. The predictors of the inflated model, the model predicting excess zeros, were not statistically significant.

Control variables with notable discrete changes included a need for information about Medicare Part D and number of information channel preferences. There was a minimal difference in the discrete changes produced in the PA domain-based model versus the overall PA model; therefore, only the discrete changes from the overall PA model are discussed. Beneficiaries who stated that they had a need for information used 0.275 more information sources than beneficiaries who did not state a need for information. A beneficiary who had the highest number of information channel preferences (ie, five) used 1.23 more sources of information than a beneficiary who had not information channel preferences.

Table 16. Zero-Inflated Negative Binomial Model Assessing Number of Information Sources Used (N = 6,434)

	Model with PA Domains			Model with PA Summary		
	Coef.	SE	p Value	Coef.	SE	p Value
PA domains						
SCSE	0.002	0.005	0.746			
PC	−0.002	0.004	0.698			
HIS	−0.014	0.003	0.000*			
Assertiveness	−0.006	0.003	0.045*			
PA summary score				−0.023	0.006	0.000*
Sociodemographics						
<i>Race/ethnicity (ref. white)</i>						
Black	−0.213	0.093	0.024*	−0.218	0.092	0.019*
Hispanic	−0.175	0.098	0.079	−0.186	0.098	0.060
Other	−0.345	0.134	0.011*	−0.342	0.134	0.012*
Age in years	−0.001	0.003	0.785	0.000	0.003	0.932
Male	−0.084	0.042	0.050	−0.095	0.042	0.026*
Employed	0.205	0.064	0.002*	0.204	0.064	0.002*

Table 16. Zero-Inflated Negative Binomial Model Assessing Number of Information Sources Used (N = 6,434)

	Model with PA Domains			Model with PA Summary		
	Coef.	SE	p Value	Coef.	SE	p Value
High school graduate	0.040	0.063	0.532	0.052	0.062	0.402
Income < \$25	0.077	0.052	0.143	0.074	0.052	0.155
Married	0.143	0.049	0.005*	0.149	0.049	0.003*
MSA	-0.071	0.069	0.303	-0.069	0.069	0.323
Physical and cognitive functioning						
<i>Health status (ref. fair/poor)</i>						
Excellent/very good	0.069	0.064	0.287	0.059	0.064	0.355
Good	0.124	0.062	0.046*	0.122	0.061	0.048*
<i>Health status compared to last year (ref. worse)</i>						
Better	-0.056	0.068	0.413	-0.055	0.066	0.412
Same	-0.099	0.050	0.051	-0.101	0.051	0.049*
Number of disease	0.031	0.010	0.002*	0.033	0.010	0.001*
Problems seeing	0.143	0.054	0.009*	0.149	0.055	0.007*
Problems hearing	0.027	0.044	0.538	0.031	0.044	0.479
Seeing causes problems learning about Medicare	-0.008	0.080	0.924	-0.011	0.080	0.890
Hearing causes problems learning about Medicare	-0.090	0.075	0.236	-0.086	0.074	0.249
ADL	-0.022	0.061	0.717	-0.026	0.062	0.680
IADL	-0.005	0.054	0.920	-0.003	0.053	0.956
Poor cognitive function	-0.065	0.046	0.156	-0.064	0.045	0.161
Problems concentrating	-0.075	0.068	0.276	-0.064	0.067	0.344
Makes own insurance decisions	-0.083	0.044	0.066	-0.080	0.045	0.075
Access to information						
Has Internet access	0.145	0.044	0.001*	0.147	0.045	0.001*
Adequate literacy	0.012	0.070	0.863	0.013	0.069	0.854
Need						
Needed information about Medicare Part D	0.378	0.077	0.000*	0.379	0.076	0.000*
Prior knowledge						
Discount card	0.098	0.057	0.088	0.095	0.056	0.094

Table 16. Zero-Inflated Negative Binomial Model Assessing Number of Information Sources Used (N = 6,434)

	Model with PA Domains			Model with PA Summary		
	Coef.	SE	p Value	Coef.	SE	p Value
Medicare Part D	0.236	0.061	0.000*	0.231	0.061	0.000*
Access to prescription drugs						
Rx coverage 2005	-0.200	0.057	0.001*	-0.196	0.057	0.001*
Rx discount card	0.263	0.080	0.001*	0.264	0.079	0.001*
Did not fill need medication	0.239	0.082	0.004*	0.232	0.083	0.006*
Uses mail order pharmacy	-0.084	0.054	0.121	-0.080	0.052	0.132
Gets medications from outside of the United States	0.158	0.079	0.048*	0.161	0.081	0.048*
Asks for generic medications	0.120	0.047	0.012*	0.122	0.047	0.011*
Uses samples	0.142	0.053	0.009*	0.143	0.052	0.007*
Takes a smaller dose than prescribed	-0.050	0.108	0.647	-0.055	0.109	0.613
Compares drug prices	0.136	0.051	0.009*	0.137	0.051	0.008*
Skips doses	-0.001	0.100	0.996	0.010	0.099	0.923
Access to care						
Had trouble or delayed getting care	0.130	0.077	0.096	0.141	0.077	0.068
Supplemental insurance						
Medicaid	0.105	0.135	0.435	0.111	0.131	0.400
HMO	0.104	0.157	0.508	0.117	0.156	0.457
ESI	0.190	0.127	0.137	0.202	0.126	0.113
Tricare/Medigap	0.253	0.127	0.049*	0.261	0.128	0.044*
Information channel preferences						
Number of preferences	0.289	0.027	0.000*	0.294	0.027	0.000*
Constant	-1.099	0.286	0.000	-1.166	0.280	0.000
Inflated model						
Medicaid	-2.576	79.704	0.974	-3.101	141.192	0.983
ESI	2.805	3.044	0.359	2.832	3.109	0.364
Tricare/Medigap	0.818	0.713	0.254	0.813	0.693	0.244
Adequate literacy	-0.297	0.418	0.479	-0.297	0.418	0.479
HMO	2.410	2.818	0.394	2.438	2.895	0.402
Constant	-3.325	3.513	0.346	-3.350	3.563	0.349

Table 16. Zero-Inflated Negative Binomial Model Assessing Number of Information Sources Used (N = 6,434)

Model with PA Domains			Model with PA Summary		
Coef.	SE	p Value	Coef.	SE	p Value

*Significant coefficient

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily life; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; ref. = reference group; Rx = prescription drug; SCSE = self-care self-efficacy; SE = standard error

Nonpreferred Information Channel Use

The assessment of nonpreferred information channel use was initially conducted in the entire sample. Approximately 32.2% of beneficiaries used nonpreferred information channels to learn about Medicare Part D. The remainder of the sample consisted of a mixture of nonseekers and seekers that used preferred channels. Many significant bivariate relationships were observed between nonpreferred use and the variables of interest as well as the control variables. These relationships are summarized in Table 17. Patient activation domain scores differed by nonpreferred channel status; beneficiaries who used nonpreferred information channels reported better physician communication, health information seeking, assertiveness, and overall PA compared preferred channel users. Although significant differences in scores were observed, they were too small to be considered important. Racial/ethnic differences also were found. Blacks (7.5% vs. 9.8%) and Hispanics (6.3% vs. 7.4%) were less likely to use nonpreferred channels than were white beneficiaries (83.8% vs. 78.3%).

Many of the control variables varied by nonpreferred channel use. Among the sociodemographics variables, younger age, having a high school diploma, being employed, and being married were associated with being a nonpreferred channel user. Many of the information behavior variables also varied by nonpreferred channel use. Need for Medicare Part D information was substantially greater in the nonpreferred channel cohort (20.9% vs. 9.0%). Nonpreferred channel users were more likely to have prior knowledge of the Medicare discount card (75.9% vs. 67.5%) and Medicare Part D (77.2% vs. 66.5%), have access to the Internet (51.0% vs. 42.5%), and adequate

literacy (64.3% vs. 59.2%) compared to preferred channel users. All of the access to prescription medication variables were associated with nonpreferred use except using mail order pharmacies and skipping medication doses. Beneficiaries with prescription drug coverage in 2005 were less likely to use nonpreferred sources (60.3% vs. 74.8%). Nonpreferred channel users tended to have more information channel preferences than preferred channel users (2.1 vs. 1.4).

Physical and cognitive functioning also varied across cohorts. Nonpreferred channel users were more likely to report better health compared to the previous year, hearing and seeing problems, and poor cognitive function than were nonseekers. They were less likely to have the same health as the last year, no IADLs, and to make their own insurance decisions compared to nonseekers. Lastly, access to care varied by group. Nonpreferred channel users were more likely to have trouble getting or delaying care and were more likely to be insured through Tricare or Medigap plans, while preferred channel users were more likely to be enrolled in HMO or ESI.

Table 17. Differences in Characteristics between Nonpreferred and Preferred Information Channel Users (N = 6,434)

	Used a Nonpreferred Channel N = 2,068	Did Not Use a Nonpreferred Channel N = 4,366	p Associated with T
PA			
Mean SCSE (SE)	16.8 (0.16)	17.0 (0.21)	0.28
Mean PC (SE)	15.9 (0.16)	16.4 (0.21)*	0.01
Mean HIS (SE)	20.9 (0.20)	22.5 (0.20)*	0.00
Mean assertiveness (SE)	16.8 (0.18)	17.5 (0.18)*	0.00
PA summary mean (SE)	17.6 (0.22)	18.3 (0.16)*	0.00
Demographics			
<i>Race/ethnicity</i>			
White	83.8%	78.3%*	0.00
Black	7.5%	9.8%*	0.01
Hispanic	6.3%	7.4%*	0.04
Age in years (SE)	72.2 (0.26)	73.2 (0.18)*	0.00

Table 17. Differences in Characteristics between Nonpreferred and Preferred Information Channel Users (N = 6,434)

	Used a Nonpreferred Channel N = 2,068	Did Not Use a Nonpreferred Channel N = 4,366	<i>p</i> Associated with <i>T</i>
Male	39.9%	42.1%	0.10
High school grad	77.2%	73.5%*	0.00
Income < \$25K	55.7%	56.0%	0.83
Employed	12.6%	9.7%*	0.00
Married	56.4%	53.0%*	0.04
MSA	71.2%	76.5%	0.08
Need			
Need prescription drug coverage info	20.9%	9.0%*	0.00
Access to information			
Adequate literacy	64.3%	59.2%*	0.00
Access to the Internet	51.0%	42.5%*	0.00
Access to prescription drugs			
Had Rx coverage in 2005	60.3%	74.8%*	0.00
Rx discount card	24.3%	10.2%*	0.00
Has not filled medications	6.7%	2.6%*	0.00
Uses mail order pharmacy	30.4%	32.3%	0.24
Gets medications from outside of the United States	8.8%	5.8%*	0.00
Asks for generic medications	59.8%	50.1%*	0.00
Uses samples	61.0%	47.5%*	0.00
Takes a smaller dose than prescribed	12.6%	8.9%*	0.00
Compares drug prices	31.0%	19.0%*	0.00
Has skipped doses	11.7%	8.2%	0.00
Prior knowledge			
Medicare discount card	75.9%	67.5%*	0.00
Medicare Part D	77.2%	66.5%*	0.00
Information channel preferences			
Taking with others	52.4%	41.3%*	0.00
Using a brochure	84.9%	58.7%*	0.00

Table 17. Differences in Characteristics between Nonpreferred and Preferred Information Channel Users (N = 6,434)

	Used a Nonpreferred Channel N = 2,068	Did Not Use a Nonpreferred Channel N = 4,366	p Associated with T
Internet	16.3%	6.7%*	0.00
Media	51.3%	32.9%*	0.00
Mean number of channels (SE)	2.1 (0.03)	1.4 (0.04)*	0.00
Info count (SE)	1.8 (0.03)	0.1 (0.01)	0.00
Physical and cognitive functioning			
<i>Health Status</i>			
Excellent/very good	41.4%	43.0%	0.33
Good	33.8%	32.3%	0.23
Fair/poor	24.8%	24.7%	0.96
<i>Health compared to last year</i>			
Better	17.8%	14.8%*	0.00
Same	59.9%	64.9%*	0.00
Worse	22.4%	20.3%	0.08
Difficulty seeing	31.5%	26.7%*	0.00
Difficulty hearing	36.5%	30.1%*	0.00
Problem with sight prevent learning about Medicare	8.7%	8.0%	0.47
Problem with hearing prevent learning about Medicare	6.4%	6.2%	0.77
Total number of disease (SE)	4.1 (0.07)	3.8 (0.04)*	0.00
No IADL	53.5%	57.2%*	0.02
No ADL	70.6%	73.2%	0.07
Poor cognitive functioning	25.2%	22.4%*	0.03
Trouble concentrating	11.4%	11.0%	0.61
Makes own insurance decision	65.0%	66.8%	0.33
Access to care			
Trouble or delayed getting care	10.3%	6.5%*	0.00
<i>Supplemental insurance</i>			
Medicaid	14.6%	15.6%	0.35
HMO	12.1%	16.5%*	0.00

Table 17. Differences in Characteristics between Nonpreferred and Preferred Information Channel Users (N = 6,434)

	Used a Nonpreferred Channel N = 2,068	Did Not Use a Nonpreferred Channel N = 4,366	<i>p</i> Associated with <i>T</i>
ESI	28.7%	37.7%*	0.00
Tricare/self-pay	34.7%	21.9%*	0.00
Public/FFS	9.9%	8.3%	0.13

**p* value < 0.05

ADL = activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service; IADL = instrumental activities of daily living; HIS = health information seeking; HMO = health maintenance organization; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; Rx = prescription drugs; SCSE = self-care self-efficacy; SE = standard error

Regression Analyses

To assess use of nonpreferred channels, I used a Heckman probit model. The instrumental variables measuring prior knowledge were appropriate because they only predicted information seeking and not nonpreferred channel use (Table 49 in the Appendix E). After the selection model was run, rho, the correlation between the 2 equations, was not significantly different from zero. Therefore, there was no requirement to adjust for selection, and a logistic regression model predicting nonpreferred channel use was conducted only on information seekers (n = 2,467) for ease of interpretation. This model had all the same relationships as a probit model predicting nonpreferred channel use (Table 49 in the Appendix E). Two models were predicted, 1 model for the PA domains and 1 model for overall PA. Regardless of the model used, the predicted probability for using nonpreferred channel was 0.837. Table 18 shows the results of the logistic regression models predicting nonpreferred channel use. The only PA domain that predicted nonpreferred channel use was self-care self-efficacy. Poor self-care self-efficacy was associated with nonpreferred channel use; for every 1 point increase in scores (poorer self-care self-efficacy) the odds of using a nonpreferred channel increased by 1.04 ($p < 0.05$). If self-care self-efficacy scores increased by the MID (2.886 points) the odds of using a nonpreferred information channel would increase by 11%. If the average

score decreased by the MID the OR = 0.903. The overall PA summary score did not predict nonpreferred channel use.

Few control variables predicted nonpreferred channel use; none of them were sociodemographic or access to care variables. Information behavior related variables measuring need, prior knowledge, and access to information did not predict nonpreferred channel use, but the number of information sources used did predict nonpreferred channel use. As beneficiaries used more information sources, the odds of nonpreferred channel use increased (OR = 2.59, $p < 0.001$). The access to prescription medication variables were associated with nonpreferred channel use. The odds of nonpreferred channel use increased if beneficiaries had prescription drug coverage in 2005, used prescription discount cards, and did not fill a needed medication (OR = 2.51, $p < 0.05$). Very few physical and cognitive function variables predicted nonpreferred channel use. Beneficiaries with hearing problems had greater odds of using a nonpreferred channel (OR = 1.48, $p < 0.05$), yet beneficiaries who had hearing problems that prevented them from learning about Medicare had lower odds of using information channels they did not prefer (OR = 0.60, $p < 0.05$). The relationships just discussed were consistent across the models with PA domains and the overall PA.

The marginal effect of a 1-point change in self-care self-efficacy scores was 0.007. Variables with sizable marginal effects included not filling a prescription medication in the past (ME = 0.148) and number of information sources used (ME = 0.191).

Table 18. Logistic Regression Model Predicting Nonpreferred Channel Use (N = 2,467)

	Model with PA Domains			Model with PA Summary Score		
	OR	95% CI	<i>p</i> Value	OR	95% CI	<i>p</i> Value
PA domains						
SCSE	1.04	[1.01, 1.07]	0.013*			
PC	0.98	[0.96, 1.00]	0.069			
HIS	0.99	[0.97, 1.01]	0.429			

Table 18. Logistic Regression Model Predicting Nonpreferred Channel Use (N = 2,467)

	Model with PA Domains			Model with PA Summary Score		
	OR	95% CI	p Value	OR	95% CI	p Value
Assertiveness	0.99	[0.97, 1.01]	0.383			
PA summary score				1.00	[0.96, 1.04]	0.807
Sociodemographics						
<i>Race/ethnicity (ref. white)</i>						
Black	0.88	[0.52, 1.54]	0.654	0.89	[0.52, 1.55]	0.661
Hispanic	1.06	[0.62, 1.75]	0.838	1.05	[0.61, 1.75]	0.863
Other	0.52	[0.25, 1.11]	0.091	0.53	[0.26, 1.12]	0.095
Age in years	1.00	[0.99, 1.02]	0.887	1.00	[0.99, 1.02]	0.858
Male	1.06	[0.82, 1.34]	0.649	1.05	[0.81, 1.33]	0.713
Employed	0.75	[0.51, 1.13]	0.162	0.77	[0.53, 1.15]	0.186
High school graduate	1.14	[0.83, 1.59]	0.415	1.16	[0.85, 1.60]	0.369
Income < \$25	0.99	[0.74, 1.32]	0.943	0.97	[0.73, 1.30]	0.862
Married	1.05	[0.80, 1.38]	0.705	1.06	[0.80, 1.38]	0.697
MSA	1.03	[0.64, 1.69]	0.910	1.04	[0.65, 1.71]	0.858
Physical and cognitive functioning						
<i>Health status (ref. fair/poor)</i>						
Excellent/very good	0.94	[0.63, 1.40]	0.770	0.94	[0.62, 1.40]	0.755
Good	1.01	[0.70, 1.43]	0.968	1.01	[0.70, 1.44]	0.938
<i>Health status compared to last year (ref. worse)</i>						
Better	1.15	[0.81, 1.66]	0.435	1.15	[0.81, 1.65]	0.439
Same	1.16	[0.85, 1.60]	0.345	1.15	[0.84, 1.59]	0.380
Number of disease	0.99	[0.94, 1.05]	0.731	0.99	[0.94, 1.05]	0.816
Problems seeing	1.09	[0.79, 1.47]	0.599	1.11	[0.81, 1.49]	0.513
Problems hearing	1.48	[1.08, 2.04]	0.014*	1.53	[1.12, 2.11]	0.008*
Seeing causes problems learning about Medicare	0.94	[0.60, 1.50]	0.796	0.93	[0.60, 1.47]	0.748
Hearing causes problems learning about Medicare	0.60	[0.39, 0.95]	0.026*	0.60	[0.39, 0.95]	0.024*
ADL	1.20	[0.88, 1.64]	0.252	1.21	[0.89, 1.65]	0.233
IADL	0.94	[0.70, 1.30]	0.711	0.95	[0.70, 1.32]	0.764

Table 18. Logistic Regression Model Predicting Nonpreferred Channel Use (N = 2,467)

	Model with PA Domains			Model with PA Summary Score		
	OR	95% CI	p Value	OR	95% CI	p Value
Poor cognitive function	0.82	[0.60, 1.13]	0.230	0.86	[0.63, 1.17]	0.327
Problems concentrating	1.08	[0.71, 1.63]	0.721	1.09	[0.71, 1.65]	0.695
Makes own insurance decisions	1.31	[0.97, 1.76]	0.069	1.29	[0.96, 1.73]	0.087
Access to information						
Has Internet access	0.87	[0.67, 1.15]	0.327	0.87	[0.67, 1.16]	0.333
Adequate literacy	1.36	[0.97, 1.92]	0.079	1.33	[0.94, 1.88]	0.108
Need						
Needed information about Medicare Part D	1.25	[0.89, 1.74]	0.197	1.26	[0.91, 1.75]	0.168
Access to prescription drugs						
Rx coverage 2005	1.39	[1.02, 1.88]	0.033*	1.41	[1.04, 1.89]	0.024*
Rx discount card	1.55	[1.10, 2.12]	0.009*	1.57	[1.12, 2.16]	0.007*
Did not fill needed medication	2.51	[1.20, 5.10]	0.012*	2.46	[1.18, 5.00]	0.014*
Uses mail order pharmacy	1.06	[0.78, 1.45]	0.705	1.07	[0.79, 1.46]	0.664
Gets medications from outside of the United States	0.92	[0.51, 1.66]	0.770	0.93	[0.52, 1.67]	0.803
Asks for generic medications	0.83	[0.63, 1.12]	0.214	0.83	[0.63, 1.11]	0.187
Uses samples	1.06	[0.80, 1.41]	0.688	1.06	[0.81, 1.41]	0.658
Takes a smaller dose than prescribed	1.26	[0.56, 2.80]	0.568	1.28	[0.58, 2.75]	0.535
Compares drug prices	1.06	[0.77, 1.45]	0.721	1.05	[0.76, 1.44]	0.767
Skips doses	0.99	[0.47, 2.07]	0.970	0.96	[0.48, 1.96]	0.916
Access to care						
Had trouble or delayed getting care	1.18	[0.76, 1.89]	0.475	1.18	[0.76, 1.88]	0.480
<i>Supplemental insurance (ref. public/FFS)</i>						
Medicaid	0.89	[0.55, 1.42]	0.637	0.91	[0.56, 1.45]	0.703
HMO	0.89	[0.49, 1.61]	0.705	0.92	[0.51, 1.65]	0.773
ESI	1.03	[0.61, 1.73]	0.923	1.05	[0.62, 1.75]	0.868
Tricare/Medigap	0.82	[0.54, 1.24]	0.345	0.83	[0.55, 1.25]	0.387
Information sources						

Table 18. Logistic Regression Model Predicting Nonpreferred Channel Use (N = 2,467)

	Model with PA Domains			Model with PA Summary Score		
	OR	95% CI	p Value	OR	95% CI	p Value
Number of information sources	2.59	[1.87, 3.58]	0.000*	2.60	[1.87, 3.59]	0.000*

* $p < 0.05$

CI = confidence interval; ADL = activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily life; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; OR = odds ratio; ref. = reference group; SCSE = self-care self-efficacy

Summary of Aim 2 Hypotheses

Although every few PA domains predicted the Medicare Part D information behaviors, most agreed with the hypothesized relationships that increased PA was associated with a greater likelihood of exhibiting the specific information behaviors.

Medicare Part D Information Seeking.

Beneficiaries with higher levels of health information seeking were more likely to seek Medicare Part D information. The overall PA score also predicted information seeking as hypothesized. Previous literature has shown that past information-seeking experiences might predict future information seeking because seekers develop information-seeking self-efficacy.^{108, 109} It is possible that self-care self-efficacy did not predict Medicare Part D information seeking because self-care self-efficacy is not specific to information seeking.⁶⁵ Good physician communication did not lead to Medicare Part D information seeking. I assumed beneficiaries with good physician communication would be more likely to look for information on Medicare Part D because physicians might have encouraged patients to get coverage. Previous research is in conflict. Although 1 study showed that patients were more likely to look at health information if their physicians were good communicators,⁶⁴ another study found that patients with good physician listeners were less likely to look at health information.⁸⁶ Regarding overall PA, Hibbard did not find an association between PA and asking for help with Medicare Part D.¹² I believe the null result that she observed occurred because past help

seekers were merged with potential help seekers. If the analysis had been limited to patients who sought help, the result might have been different.

Number of Sources of Information

Beneficiaries with higher levels of health information seeking and assertiveness used more information sources to learn about Medicare Part D. Similarly, beneficiaries with higher overall PA used more information sources. Wilson believes people with information-seeking self-efficacy put more effort into seeking;²⁷ therefore, if health information seeking is a proxy for information-seeking self-efficacy, the result showing health information seeking is associated with increasing information source count would be expected. Assertiveness is a measure of disagreeing with doctors and switching doctors; therefore, it would be expected that assertive beneficiaries would compare Medicare Part D information by using several information sources. Because self-care self-efficacy is not specific to information seeking, a lack of association with information source count is understandable.⁶⁵

Nonpreferred Information Channel Use

There is a lack of literature on information channels and no example to compare these results. However, because of the large number of beneficiaries who looked for information about Medicare Part D from nonpreferred information channels, these results are important. Self-care self-efficacy was the only PA domain that predicted use of a nonpreferred channel. The relationship was opposite of the relationship hypothesized; lower self-care self-efficacy was associated with nonpreferred channel use. People with good self-care self-efficacy seem to know how to find information from channels they prefer. Health information seeking was not associated with nonpreferred channel use as it was with the other information behaviors. This result indicates that it is not necessary for a variable that affects the likelihood of seeking, to affect how one looks for information. The requirements for seeking are situation specific;²⁷ therefore, an affinity to look for information might not explain nonpreferred channel use because nonpreferred channel use might depend more on the information available.²⁷ Contrary to

my hypotheses, no association exists between assertiveness and nonpreferred channel use, although assertive patients are more likely to compare options and switch doctors. It is possible that assertive beneficiaries are more skilled at finding information through the information channel they prefer. Therefore, they do not use information from nonpreferred channels. Physician communication was not associated with nonpreferred channel use. Even if physicians were good communicators, most physicians were not knowledgeable about Medicare Part D;⁵ therefore, patients probably had to seek information from nonpreferred channels at the same rate as beneficiaries who had poor physician communicators.

Overall PA was not associated with nonpreferred information channel use. As with health information seeking, overall PA might predict the decision to seek, but might not predict how one would seek. Other activating mechanisms (as Wilson calls them), other than PA, might be responsible for behaviors subsequent to the decision to seek information.²⁷

Racial/Ethnic Differences

As predicted, racial/ethnic differences existed in Medicare Part D information-seeking behaviors. Racial/ethnic minorities were less likely to exhibit these behaviors. Beneficiaries of *Other* races sought Medicare Part D information less often than did white beneficiaries. Past literature on racial differences in Medicare Part D information seeking was descriptive and limited to blacks and whites.^{23, 40} In this study, mean differences in Medicare Part D information seeking between blacks and whites and Hispanics and whites were explained away with the inclusion of the variables of interest and the control variables in the model predicting information seeking. The literature lacks examples of studies measuring racial/ethnic differences in the number of sources of information used. The results showing that both blacks and beneficiaries of other races use less information sources than do whites are a new addition to the literature. Lastly, no racial differences were found when predicting nonpreferred channel use. Again, the covariates explained away many of the differences observed in

the bivariate analyses. Previous literature reports racial/ethnic differences in information channel preferences, but like the information-seeking literature these results are descriptive.²⁵

Summary

The health information-seeking domain was positively associated with both information seeking and information source count. Assertiveness was associated with the number of sources of information used. Self-care self-efficacy predicted nonpreferred channel use. Overall PA predicted Medicare Part D information seeking and number of information sources. These results show that PA could be the target of interventions aimed at improving Medicare Part D information-seeking behaviors. In addition, these results add new information to the literature because past studies about Medicare Part D information-seeking experiences have been descriptive in nature.

Aim 3: To Determine Whether the Associations Between: Social-Environmental Factors and PA, and PA and Information Seeking, Vary Across Racial/Ethnic Subgroups

In Aims 1 and 2, I reported mean racial/ethnic differences in PA. In this aim, I repeated many of the analyses conducted in Aims 1 and 2 to determine differences in association between predictors and outcomes by race/ethnicity. These analyses were limited to white, black, and Hispanic beneficiaries because of the small number of beneficiaries of other races. First, Aim 1 descriptive statistics and regression models are presented, followed by Aim 2.

Predicting Patient Activation

Table 19 consists of the bivariate relationships of each variable of interest and control variable across racial/ethnic groups. The sample included 8,730 respondents overall, 7,212 white beneficiaries, 841 black beneficiaries, and 677 Hispanic beneficiaries. There were racial/ethnic differences in PA. Blacks and Hispanics tended to have poorer self-care self-efficacy (higher scores) than whites (Blacks vs. whites: 18.2 vs. 16.6, $p < 0.05$; Hispanics vs. white: 18.5 vs. 16.6, $p < 0.05$). Blacks and Hispanics had significantly poorer health information-seeking skills than had white beneficiaries. Blacks had

poorer physician communication compared to whites and Hispanics. The largest score difference was with overall PA (Black: 25.5; Hispanic: 25.4; White: 22.4); yet again blacks and Hispanics were less activated than were their white counterparts. Although many significant differences existed, none of them would be considered an MID.

Although there were racial/ethnic differences among the social environmental variables, very few of these differences were seen among the patient-perception-of-physician variables. Hispanics were more likely to report that their physician was thorough, compared to both whites and blacks. Black beneficiaries were more likely to report that their physician lacked compassion than were white beneficiaries (7.1% vs. 4.8%); however, they were less likely to report that their care was rushed than were whites (11.2% vs. 16.0%). Social support also differed by race/ethnicity. Blacks were less likely to be married (31.5%) than were both whites (57.4%) and Hispanics (51.9%), and Hispanics were less likely to be married than were whites. Hispanics (25.4%) were less likely to live alone than were blacks (39.4%) and whites (30.8%), and blacks were more likely to live alone than were whites. Although blacks were more likely to have only 1 child, compared to whites and Hispanics, Hispanics were more likely than were whites to have more than 2 children. Taking a helper to a visit was more common among Hispanics beneficiaries (47.8%) than it was among either black (35.5%) or white (33.9%) beneficiaries. Black and Hispanic beneficiaries were more likely to live in an urban area than were white beneficiaries. There were no differences in community housing across subgroups.

Many of the racial/ethnic differences were observed with the control variables. Demographics differed across group. Blacks (67.9 years) and Hispanics (70.0 years) were slightly younger than were whites (72.6 years), and blacks were even younger than were Hispanics. There were fewer black males in the sample compared to white beneficiaries. Education varied greatly across groups. Both blacks (57.7%) and Hispanics (44.0%) were less likely to have graduated from high school than were whites (79.0%), and Hispanics were even less like to have a high school diploma than were blacks.

Blacks and Hispanics had lower incomes than had whites, and Hispanics were less likely to be employed than were their white counterparts.

The rate of health problems varied by race/ethnicity. Blacks and Hispanics had poorer health status than whites; however, Hispanics were more likely to report improvement in their health. Despite poorer health, blacks and Hispanics had slightly fewer comorbid conditions. Blacks and Hispanics were less likely to report difficulty hearing than were whites, but blacks were more likely to report sight problems compared to both whites and Hispanics. Blacks were more likely to report a history of IADL compared to whites (50.3% vs. 42.5%). Hispanics reported more IADL, ADL, and trouble concentrating than did whites. They also were more likely to report poor cognitive function than both blacks and whites. Lastly, white beneficiaries (65.0%) had better literacy than both black (55.5%) and Hispanic (43.9%) beneficiaries.

Access to care variables also varied across racial/ethnic group. Hispanics were more likely to report having trouble getting or delaying needed care than whites. Blacks (34.6%) and Hispanics (38.5%) were more like to be on Medicaid than were whites (9.9%), but they were less likely to have ESI and Tricare or Medigap than were whites. Blacks were more likely to have ESI than were Hispanics. Black beneficiaries were more likely to have public or FFS insurance than were white and Hispanic beneficiaries. Hispanics were more likely to be enrolled in a HMO than were both blacks and whites.

Table 19. Differences in Characteristics between Blacks, Whites, and Hispanics

Variables	White (N = 7,212)	Black (N = 841)	Hispanic (N = 677)
PA domains			
Mean SCSE (SE)	16.6 (0.18)	18.2 (0.34)*	18.5 (0.34)*
Mean PC (SE)	16.0 (0.17)	17.4 (0.32)*	16.4 (0.31)^
Mean HIS (SE)	21.3 (0.15)	24.4 (0.29)*	24.8 (0.54)*
Mean assertiveness (SE)	17.2 (0.16)	17.2 (0.31)	17.7 (0.45)

Table 19. Differences in Characteristics between Blacks, Whites, and Hispanics

Variables	White (N = 7,212)	Black (N = 841)	Hispanic (N = 677)
Mean PA summary (SE)	17.8 (0.12)	18.3 (0.24)*	19.3 (0.25)*
Social environmental			
Thorough	93.8%	93.7%	96.3%*^
Competent	98.9%	98.8%	98.3%
Confident	94.7%	94.2%	94.5%
Lacked compassion	4.8%	7.1%*	5.5%
Hurried care	16.0%	11.2%*	13.1%
Content knowledge	96.3%	95.8%	96.9%
Concerned	95.6%	95.4%	96.5%
Married	57.4%	31.5%*	51.9%*^
Lives alone	30.8%	39.4%*	25.4%*^
Number of living children			
No children alive	9.0%	11.1%	8.6%
One child living	10.5%	14.4%*	9.9% [^]
Two children living	26.9%	16.5%*	20.2%*
Three or more children	53.6%	58.0%	61.2%*
Takes helper to the doctor	33.9%	35.5%	47.8%*^
Lives in community housing	6.3%	4.8%	5.3%
Lives in a urban area	73.1%	81.7%*	90.0%*
Sociodemographic			
Age (SE)	72.6 (0.15)	67.9 (0.49)*	70.0 (0.48)*^
Male	42.3%	36.6%*	40.1%
Employed	11.6%	10.8%	8.2%*
High school graduate	79.0%	57.7%*	44.0%*^
Income < \$25	50.9%	80.8%*	76.9%*
Physical and cognitive functioning			
Health status			
Excellent/very good	43.6	26.3%*	26.8%*
Good	33.4%	35.3%	37.6%*
Fair/poor	23.0%	38.4%*	35.6%*
Health status compared to previous year			

Table 19. Differences in Characteristics between Blacks, Whites, and Hispanics

Variables	White (N = 7,212)	Black (N = 841)	Hispanic (N = 677)
Better	15.0%	18.2%	21.9%*
Same	63.0%	57.2%*	53.8%*
Worse	21.9%	24.6%	24.2%
Total number of diseases (SE)	3.8 (0.03)	3.6 (0.08)*	3.6 (0.09)*
Problems seeing	28.2%	34.1%*	25.3%^
Problems hearing	34.6%	19.5%*	19.5%*
No IADL	57.5%	49.7%*	47.7%*
No ADL	73.2%	69.2%	68.0%*
Poor cognitive function	22.7%	23.8%	31.2%^
Problems concentrating	10.7%	13.2%	15.0%*
Adequate literacy	65.0%	55.5%*	43.9%*
Access to care			
Trouble getting care	3.8%	5.6%	6.8%*
Delayed getting care	8.0%	9.8%	10.6%*
Health insurance			
Medicaid	9.9%	34.6%*	38.5%*
HMO	14.7%	12.9%	22.6%^
ESI	38.4%	27.0%*	20.2%^
Tricare/Medigap	26.5%	8.3%*	8.4%*
Public/FFS	10.5%	17.3%*	10.2%^

*p value for $t < 0.05$, blacks or Hispanics vs. whites; ^ p value for $t < 0.05$, blacks vs. Hispanics

ADL = activities of daily living; FFS = fee-for-service; ESI = employer sponsored insurance; HIS = health information seeking; HMO = health maintenance organization;; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; SCSE = self-care self-efficacy; SE = standard error

Regression Analyses

I explored whether factors found significant in the unstratified data were significant for blacks, whites, and Hispanics. Some variables had too few observations for stable estimation, so those variables were not included in the models estimated. Generalized linear models were used to estimate PA scores. Table 48 in Appendix E provides a summary of the modified Park test and link comparison results. For blacks, self-care self-efficacy followed a Poisson distribution and health information seeking

followed a Gaussian distribution; in both cases, the Modified Park tests were not significant. The coefficients generated from the modified Park test for the physician communication, assertiveness, and overall PA had 2 nonsignificant p values, so I compared deviance and BIC for the distributions corresponding with those p values. For the physician-communication domain, I compared model fit results of the gamma and inverse Gaussian distributions; the inverse Gaussian had the lowest BIC. I compared the model fit of the gamma and Poisson distributions for the assertiveness domain; the gamma distribution had the best fit. Lastly, the gamma distribution was chosen over the Poisson distribution for the overall PA.

For white beneficiaries, self-care self-efficacy, physician communication, and the overall PA followed a gamma distribution, while the distribution for the health-information-seeking domain followed a Poisson distribution. The results were definitive because the p values on the Modified Park tests were not significant. The coefficient generated from the modified Park test for the assertiveness domain was significant, so I compared deviance and BIC for the distributions closest to the coefficients. As a result, the gamma distribution was chosen over the Poisson distribution. In the Hispanic cohort, the modified Park Test identified the Poisson distribution for the self-care self-efficacy domain. Two distributions had to be compared for the remaining domains. The gamma distribution had a better fit for both the physician-communication and assertiveness domains. However, both the health information-seeking domain and overall PA had better fits with the Poisson distribution compared to the Gaussian distribution. The identity link was used for all models. In only 1 case of the 15 models estimated was a different link function preferred to the identity link. In the health information-seeking domain for whites, the difference in BIC between models with different link functions indicated the log link had a better fit than the identity link.

Self-care Self-efficacy

Table 20 contains the individual race/ethnicity models predicting self-care self-efficacy. Just as

with the pooled model in Aim 1, none of the community social environmental variables predicted self-care self-efficacy in the race/ethnicity specific models. Beneficiaries who were married had self-care self-efficacy score 0.481 points ($p < 0.05$) lower than white beneficiaries who were not married. Hurried care was the only patient-perception-of-physician variable that predicted self-care self-efficacy in whites. If beneficiaries reported hurried care, they had poorer self-care self-efficacy and their domain score increased by 0.482 points ($p < 0.01$). Taking a helper to the doctor increased self-care self-efficacy scores by 1.159 points ($p < 0.01$), indicating self-care self-efficacy worsened in black beneficiaries. Blacks who had a physician who lacked compassion had higher levels of self-care self-efficacy; scores were 1.838 points ($p < 0.05$) lower than beneficiaries who felt their physician was compassionate. Marriage was associated with better self-care self-efficacy in Hispanics; scores were 1.723 points ($p < 0.05$) lower than scores in beneficiaries who were not married. Although these variables had significant coefficients, the sizes of the coefficients did not meet the level of MID.

The relationships between the control variables and self-care self-efficacy differed across racial/ethnic groups. Several control variables predicted self-care self-efficacy in whites and blacks. However, only 1 control variable predicted self-care self-efficacy in Hispanic beneficiaries. Hispanic beneficiaries who had trouble concentrating had poorer self-care self-efficacy than did Hispanic beneficiaries without concentration problems. Scores increased by 2.587 points ($p < 0.01$) and just missed the cut point for being a MID (2.886). The Chow test was significant; indicating that some coefficients significantly differed by racial/ethnic group. The variables that differed were not social environmental variables, but age and number of comorbid conditions. The effect of age on self-care self-efficacy was significantly smaller in whites than it was in blacks (0.038 vs. 0.089, $p < 0.01$). The coefficients on number of comorbid conditions were significantly different between Hispanics and whites. The effect of number of conditions was significant and improved self-care self-efficacy in whites, but was not significant in Hispanics (-0.120 vs. 0.128 , $p < 0.05$).

Table 20. Generalized Linear Models Predicting Self-care Self-efficacy by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
Social environment									
Thorough	−0.061	0.320	0.849	−1.407	1.058	0.188	−1.808	2.436	0.460
Confident	−0.273	0.353	0.441	−0.506	1.255	0.688	0.475	1.728	0.791
Lacks compassion	0.524	0.485	0.283	−1.838	0.870	0.043*	1.221	0.947	0.200
Hurried care	0.480	0.162	0.004*	1.202	0.712	0.094	−0.379	1.136	0.739
Content knowledge	−0.072	0.448	0.873	0.342	1.283	0.792	0.102	2.140	0.962
Concerned	0.048	0.424	0.911	−0.425	1.147	0.712	−0.222	1.503	0.883
Married	−0.481	0.227	0.036*	−0.772	0.497	0.123	−1.723	0.767	0.027*
Lives alone	−0.441	0.227	0.054	−0.207	0.656	0.753	−0.897	0.886	0.314
<i>Number of living children (ref. > 2 children)</i>									
No children alive	0.439	0.282	0.122	0.114	0.831	0.891	−0.209	0.944	0.826
One kid living	0.086	0.203	0.673	0.361	0.627	0.566	−0.709	0.799	0.377
Two children living	−0.061	0.161	0.708	−0.317	0.640	0.621	−0.524	0.780	0.504
Takes helper to the doctor	0.294	0.149	0.051	1.159	0.420	0.007*	−0.114	0.609	0.852
Lives in community housing	0.199	0.317	0.532	0.940	0.947	0.323	−0.550	1.410	0.697
MSA	0.530	0.509	0.301	−0.474	0.867	0.585	1.846	1.219	0.133
Sociodemographics									
Age in years	0.038	0.010	0.000*	0.089	0.023	0.000*	0.043	0.032	0.179
Male	0.711	0.154	0.000*	0.525	0.639	0.413	0.210	0.669	0.754
Employed	0.061	0.236	0.795	0.546	0.822	0.508	0.685	1.268	0.590

Table 20. Generalized Linear Models Predicting Self-care Self-efficacy by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
High school graduate	−0.592	0.199	0.004*	−0.841	0.627	0.183	−1.009	0.568	0.079
Income < \$25	0.710	0.165	0.000*	1.449	0.644	0.027*	0.913	0.736	0.218
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/ very good	−0.800	0.277	0.005*	−1.228	0.728	0.095	−1.567	0.625	0.014*
Good	−0.106	0.218	0.628	0.366	0.727	0.616	−0.166	0.634	0.794
<i>Health status compared to last year (ref. worse)</i>									
Better	−0.548	0.237	0.023*	−1.417	0.652	0.032*	−0.602	0.639	0.348
Same	0.008	0.185	0.965	0.246	0.645	0.703	−1.024	0.557	0.069
Number of disease	−0.120	0.035	0.001*	−0.229	0.114	0.048*	0.128	0.114	0.264
Problems seeing	0.468	0.177	0.010*	1.730	0.496	0.001*	0.261	0.618	0.674
Problems hearing	1.101	0.178	0.000*	0.622	0.695	0.373	0.190	0.804	0.813
At least 1 ADL	0.379	0.166	0.025*	−0.248	0.582	0.671	1.174	0.773	0.132
At least 1 IADL	0.391	0.189	0.041*	−0.675	0.536	0.211	−0.354	0.713	0.620
Poor cognitive function	0.968	0.186	0.000*	0.859	0.671	0.204	−0.788	0.561	0.163
Problems concentrating	1.407	0.256	0.000*	0.307	0.904	0.735	2.587	0.915	0.006*
Adequate literacy	−0.443	0.193	0.023*	−0.613	0.669	0.362	−0.835	0.817	0.309
Access to care									
Trouble getting care	0.008	0.412	0.985	−0.637	1.008	0.529	−0.623	0.990	0.530
Delayed getting care	0.325	0.333	0.331	0.227	0.755	0.764	−0.837	0.893	0.351

Table 20. Generalized Linear Models Predicting Self-care Self-efficacy by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
<i>Supplemental insurance (ref. public/FFS)</i>									
Medicaid	0.610	0.376	0.108	1.766	0.757	0.022*	−0.101	0.932	0.914
HMO	0.413	0.280	0.143	0.244	0.954	0.799	0.390	0.896	0.664
ESI	0.171	0.248	0.493	−0.539	0.796	0.500	−0.597	0.969	0.539
Tricare/Medigap	0.065	0.227	0.776	−0.302	0.784	0.701	−0.585	1.150	0.612
Constant	13.635	1.004	0.000	13.822	3.286	0.000	17.154	3.708	0.000
N	7,212			841			677		

* $p < 0.05$

Coef. = coefficient; ADL = activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; PC = physician communication; ref. = reference group; SCSE = self-care self-efficacy

Based on these regressions, the predicted self-care self-efficacy score is 16.7 points for white beneficiaries and 18.3 points for black beneficiaries (Table 21). If whites had the same average characteristics as blacks and the effects of characteristics stayed as they currently are for whites, their average self-care self-efficacy score would increase to 16.9. Although whites' scores would increase by 0.2 points (poorer self-care self-efficacy), this score is still lower than the average score of blacks, 18.3. This gap reflects differences in characteristics between blacks and whites. The difference in self-care self-efficacy scores of white beneficiaries with the same average characteristics as blacks and blacks, given black characteristics, is -1.4 points. This gap in self-care self-efficacy reflects the unexplained racial difference (eg, discrimination or unmeasured factors). Thus, white beneficiaries with characteristics typical of a black person should experience self-care self-efficacy scores that are 1.4 points lower than a black person with the same characteristics. Therefore, unexplained racial differences lead to whites having better self-care self-efficacy than blacks because a lower score means better self-care self-efficacy.

Similar patterns exist between whites and Hispanics. The predicted self-care self-efficacy score for Hispanics was 18.6. When comparing the self-care self-efficacy score of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the scores are 16.7 and 17.2, respectively, resulting in a difference in scores of 0.5 points. This result indicates that the differences in characteristics of Hispanic and whites should lead whites to have a self-care self-efficacy score 0.5 points higher if they had Hispanics characteristics. The difference in self-care self-efficacy scores of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is -1.5 points. This result reflects the unexplained difference in self-care self-efficacy scores that is accounted for by unobserved differences (eg, discrimination). Thus, white beneficiaries with characteristics typical of a Hispanic person should experience self-care self-efficacy scores that are 1.5 points lower than should a Hispanic person with the same characteristics. Therefore, ethnic

differences lead to whites having better self-care self-efficacy than Hispanics because a lower score means a better self-care self-efficacy.

Table 21. Decomposition of Source of Differences in Self-care Self-efficacy Scores

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	16.7	16.9	18.3	–1.4	0.2
Hispanic	16.7	17.2	18.6	–1.5	0.5

Physician Communication

Table 22 contains the individual race/ethnicity models predicting physician communication. The community social environmental variables, community housing and urbanicity, did not significantly predict physician communication in any of the models, as with the pooled model in Aim 1. All the patient-perception-of-physician variables predicted physician communication in the white model. Hurried care and a lack of compassion were associated with poorer physician communication in whites. If beneficiaries reported hurried care, their domain scores would increase by 1.622 points ($p < 0.001$) compared to those who did not. Beneficiaries reporting a lack of compassion saw their domain scores increase by 1.712 points ($p < 0.001$). The remaining patient-perception-of-physician variables were associated with better physician communication. Scores decreased by 0.994 points ($p < 0.01$) for thoroughness, 2.236 points ($p < 0.001$) for confidence, 1.784 points ($p < 0.001$) for knowledge, and 1.849 points ($p < 0.01$) for concern. Beneficiaries with no living children, physician-communication scores were higher than beneficiaries with children (0.898 points, $p < 0.01$), indicating poorer physician communication. The effects of significant variables did not meet MIDs.

Fewer social environmental variables were associated with physician communication in the black model. No social support variables predicted physician communication. Out of the patient-perception-of-physician variables, providing thorough care and showing concern were associated with

better physician communication. Scores decreased by 3.351 points ($p < 0.01$) and 3.442 points ($p < 0.01$) for thoroughness and concern, respectively. These changes are MIDs (2.632 – 2.806 points). Hurried care was associated with poorer physician communication in blacks. If beneficiaries reported hurried care, their domain scores increased by 2.357 points ($p < 0.001$). In the Hispanic cohort, the only social environmental variable that predicted physician communication was thorough care. Beneficiaries had improved communication if they felt their physicians were thorough; physician-communication scores decreased by 4.983 points ($p < 0.01$). The effect of thoroughness also exceeded the MID.

The relationships between the control variables and physician communication differed across racial/ethnic groups. In the white subgroup, physician communication was better in younger, female beneficiaries with incomes greater than \$25,000, in excellent or very good health, with more comorbidities, or who were enrolled in a HMO or ESI. Communication broke down if beneficiaries had problems concentrating and vision problems. In the black subgroup, physician communication was better in beneficiaries with excellent or very good health, more comorbidities, and ESI. Among Hispanics, adequate literacy greatly improved physician communication, as did being employed.

The Chow test was significant, indicating some regressor effects were significantly different across racial/ethnic groups. Only 2 variables differed across models, neither of which were social environmental variables. The effect of age was significantly different between whites and Hispanics. As white beneficiaries aged, physician communication grew poorer; however, no relationship was found in Hispanics (0.032 vs. -0.002 , $p < 0.01$). The coefficients on number of comorbid conditions were significantly different between blacks and whites. Both blacks and whites experienced better communication as comorbidities increased, but the effect in blacks was stronger (-0.105 vs. -0.243 , $p < 0.05$).

Table 22. Generalized Linear Models Predicting Physician Communication by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
Social environment									
Thorough	−0.994	0.333	0.004*	−3.351	1.139	0.004*	−4.983	1.743	0.005*
Confident	−2.236	0.473	0.000*	0.129	1.241	0.918	0.383	1.169	0.744
Lacks compassion	1.618	0.427	0.000*	0.458	0.860	0.595	2.442	1.249	0.053
Hurried care	1.784	0.198	0.000*	2.357	0.808	0.004*	0.218	0.680	0.750
Content knowledge	−1.762	0.419	0.000*	−0.783	1.314	0.553	−1.336	1.963	0.498
Concerned	−1.849	0.516	0.001*	−3.442	1.247	0.007*	−1.077	1.355	0.429
Married	−0.023	0.262	0.931	0.524	0.495	0.292	−0.245	0.634	0.700
Lives alone	−0.169	0.244	0.491	0.165	0.506	0.745	1.041	0.726	0.155
<i>Number of living children (ref. > 2 children)</i>									
No children alive	0.858	0.291	0.004*	0.753	0.730	0.305	1.784	0.948	0.063
One kid living	−0.018	0.216	0.934	−0.210	0.608	0.730	0.769	0.670	0.254
Two children living	0.092	0.148	0.536	0.899	0.728	0.220	0.010	0.718	0.989
Takes helper to the doctor	−0.286	0.156	0.069	−0.251	0.521	0.631	−0.725	0.551	0.191
Lives in community housing	0.243	0.409	0.553	0.910	0.955	0.343	−1.899	1.017	0.065
MSA	0.434	0.436	0.321	0.360	0.488	0.463	0.505	1.257	0.689
Sociodemographics									
Age in years	0.032	0.009	0.000*	0.033	0.017	0.058	−0.002	0.024	0.937
Male	0.722	0.138	0.000*	0.047	0.536	0.931	0.641	0.559	0.254
Employed	−0.001	0.221	0.995	1.065	0.675	0.118	−1.813	0.590	0.003*

Table 22. Generalized Linear Models Predicting Physician Communication by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
High school graduate	−0.305	0.236	0.198	−0.922	0.478	0.056	0.043	0.560	0.939
Income < \$25	0.557	0.187	0.004*	0.815	0.638	0.204	−0.410	0.676	0.545
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	−0.979	0.227	0.000*	−1.834	0.745	0.016*	−0.624	0.601	0.302
Good	−0.249	0.185	0.182	0.172	0.668	0.797	0.630	0.535	0.242
<i>Health status compared to last year (ref. worse)</i>									
Better	−0.330	0.251	0.193	−0.992	0.742	0.184	−0.631	0.730	0.389
Same	0.019	0.174	0.913	−0.148	0.609	0.808	0.678	0.611	0.270
Number of disease	−0.105	0.034	0.003*	−0.243	0.097	0.014*	0.046	0.126	0.717
Problems seeing	0.376	0.169	0.028*	0.493	0.470	0.297	0.349	0.548	0.526
Problems hearing	0.240	0.142	0.094	0.087	0.614	0.888	−0.245	0.633	0.699
At least 1 ADL	0.074	0.172	0.668	−0.551	0.575	0.340	0.086	0.561	0.879
At least 1 IADL	−0.041	0.169	0.810	−0.703	0.718	0.331	−0.726	0.605	0.233
Poor cognitive function	0.163	0.182	0.373	1.259	0.707	0.078	−0.405	0.530	0.446
Problems concentrating	0.706	0.237	0.004*	0.081	0.839	0.923	1.288	0.718	0.076
Adequate literacy	−0.307	0.211	0.149	−0.795	0.586	0.178	−1.791	0.778	0.023*
Access to care									
Trouble getting care	−0.436	0.403	0.282	−1.182	1.078	0.276	−0.014	0.821	0.986
Delayed getting care	0.597	0.287	0.040*	1.664	0.971	0.090	−0.169	0.843	0.841

Table 22. Generalized Linear Models Predicting Physician Communication by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
<i>Supplemental Insurance (ref. public/FFS)</i>									
Medicaid	0.202	0.359	0.575	−0.205	0.883	0.817	1.123	0.723	0.123
HMO	−0.549	0.246	0.028*	−0.189	0.758	0.804	1.166	0.761	0.129
ESI	−0.624	0.241	0.011*	−1.644	0.726	0.026*	0.652	0.848	0.444
Tricare/Medigap	−0.414	0.229	0.074	−1.251	0.797	0.120	0.283	1.001	0.778
Constant	20.504	1.099	0.000	23.564	2.670	0.000	22.678	2.734	0.000
N	7,212			841			677		

**p* < 0.05

ADL = activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental ADL; MSA = metropolitan statistical area; N = number; PC = physician communication; ref. = reference group; SCSE = self-care self-efficacy

Based on these regressions, the predicted physician-communication score is 16.1 points for white beneficiaries and 17.5 points for black beneficiaries (Table 23). If whites had the same average characteristics as blacks and the effects of characteristics stayed as they currently are for whites, their average physician-communication score would increase to 16.6. Although whites' scores would increase by 0.5 points (poorer physician communication), this score is still lower than the average blacks' score of 17.5. The difference in physician-communication scores of white beneficiaries, given black characteristics, and blacks, given black characteristics, is -0.9 points. This gap in physician communication reflects unexplained racial differences (eg, trust, discrimination). White beneficiaries with characteristics typical of a black person should experience physician-communication scores that are 0.9 points lower than those of a black person with the same characteristics. Therefore, racial differences lead to whites having better physician communication than blacks because lower scores mean better physician communication.

Similar patterns exist between whites and Hispanics. The predicted physician-communication score for Hispanics was 16.6. When comparing the physician-communication score of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the scores are 16.1 and 16.6, respectively, resulting in a difference in scores of 0.5 points. This result indicates that the differences in characteristics of Hispanic and whites should lead whites to have a physician-communication score 0.5 points higher if they had Hispanic characteristics. The difference in physician-communication scores of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is 0.03 points. This result reflects the unexplained ethnic differences (eg, language, discrimination); ethnic differences have a minute effect on physician communication.

Table 23. Decomposition of Source of Differences in Physician-communication Scores

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	16.1	16.6	17.5	–0.9	0.5
Hispanic	16.1	16.6	16.6	0.03	0.5

Health Information Seeking

Table 24 contains the individual race/ethnicity models predicting health information seeking. Unlike the other PA domains, community housing predicted health information seeking in the Hispanics model. Beneficiaries living in community housing were more likely to seek health information than those who did not live in community housing. Their health information-seeking domain scores were 3.420 ($p < 0.05$) points lower. Hispanic beneficiaries who had physicians that showed concern were more likely to report health information-seeking behaviors. Their scores were 4.601 ($p < 0.05$) points lower than beneficiaries who did feel their physician showed concern. The difference exceeded the MID (3.85–4.555 points). Like the Hispanic beneficiaries, only one patient-perception-of-physician variable predicted health information seeking in whites. Patients receiving hurried care had better health information-seeking scores; their scores were 0.518 points ($p < 0.05$) lower than white beneficiaries who did not report that they received hurried care. Being married and living alone were associated with more health information seeking in whites; beneficiaries' scores decreased by 1.427 ($p < 0.001$) and 0.737 ($p < 0.05$) points, if married or living alone, respectively. Only one social environmental variable predicted health information seeking in blacks. Black beneficiaries with 1 living child had better health information-seeking behaviors; scores decreased by 2.003 ($p < 0.05$) points compared to beneficiaries who had more than 2 children.

The relationships between the control variables and health information seeking differed across racial/ethnic groups. In the white subgroup, health information seeking occurred less often in males,

and people with incomes of less than \$25,000, hearing problems, ADLs, and problems concentrating. White beneficiaries with a high school education, more comorbid conditions, or in HMO, ESI, and Tricare or Medigap supplemental insurance were more likely to seek health information. Among blacks, health information seeking occurred less often in males and beneficiaries with good health; however, beneficiaries with more comorbid conditions, ESI, and Tricare or Medigap were more likely to seek health information. Unlike many of the other PA domains, several control variables predicted health information seeking in Hispanics. Health information seeking was more likely to occur in high school graduates and in beneficiaries with excellent or very good health, more comorbid conditions, and adequate literacy. Health information seeking occurred less often in men, low-income beneficiaries, and in beneficiaries with poor cognitive function and problems concentrating.

The Chow test was significant; therefore, there is sufficient evidence to suggest that regressor effects were different across racial/ethnic groups. However, only two variables differed across models, neither of which were social environmental variables. The effect of age was not significant for any of the subgroups; however, the difference in coefficients was significant between whites and blacks (-0.002 vs. -0.025 , $p < 0.05$) and whites and Hispanics (-0.002 vs. 0.026 , $p < 0.05$). Both blacks and whites did more health information seeking as the number of comorbidities that they had increased; the effect in blacks was stronger (-0.449 vs. -0.714 , $p < 0.05$).

Table 24. Generalized Linear Model Predicting Health Information Seeking by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
Social environmental									
Thorough	−0.734	0.441	0.102	1.020	1.378	0.461	−0.623	2.924	0.832
Confident	−0.468	0.528	0.378	−0.415	1.189	0.728	3.446	1.956	0.082
Lacks compassion	−0.525	0.543	0.337	1.052	1.099	0.351	2.578	1.710	0.135
Hurried care	−0.518	0.213	0.017*	−0.149	0.870	0.864	−0.197	1.079	0.855
Content knowledge	−0.120	0.630	0.850	−0.666	1.658	0.689	−0.622	3.225	0.848
Concerned	0.216	0.598	0.719	0.164	1.195	0.891	−4.601	2.175	0.037*
Married	−1.427	0.313	0.000*	−0.709	0.763	0.355	−1.551	0.994	0.122
Lives alone	−0.737	0.331	0.028*	1.024	0.654	0.120	−0.914	1.046	0.384
Number of living children (ref. > 2 children)									
No children alive	0.633	0.374	0.093	−0.892	0.962	0.356	−0.129	0.968	0.894
One kid living	0.004	0.301	0.990	−2.003	0.819	0.016*	−0.249	0.978	0.800
Two children living	−0.194	0.216	0.372	0.645	0.966	0.506	−1.523	0.916	0.099
Takes helper to the doctor	0.079	0.198	0.692	0.375	0.592	0.528	−1.530	0.806	0.061
Lives in community housing	0.199	0.458	0.666	0.705	1.581	0.657	−3.420	1.349	0.013*
MSA	0.324	0.356	0.365	−0.593	0.572	0.302	−0.165	1.381	0.905
Sociodemographic									
Age in years	−0.002	0.011	0.880	−0.025	0.023	0.284	0.026	0.037	0.483
Male	2.425	0.194	0.000*	2.429	0.668	0.000*	1.898	0.916	0.041*
Employed	0.770	0.311	0.015*	−0.659	0.821	0.424	1.151	1.058	0.279

Table 24. Generalized Linear Model Predicting Health Information Seeking by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
High school graduate	−2.053	0.257	0.000*	−1.153	0.757	0.131	−1.899	0.835	0.025*
Income < \$25	0.976	0.218	0.000*	−0.006	0.829	0.994	3.281	1.010	0.002*
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	−0.534	0.376	0.159	0.724	0.829	0.385	−2.221	1.087	0.044*
Good	−0.443	0.271	0.105	1.964	0.725	0.008*	−0.859	0.951	0.369
<i>Health status compared to last year (ref. worse)</i>									
Better	−0.479	0.377	0.207	−1.153	0.904	0.205	−0.608	1.576	0.701
Same	0.706	0.261	0.008*	−0.642	0.795	0.421	−1.131	1.536	0.463
Number of disease	−0.449	0.056	0.000*	−0.714	0.130	0.000*	−0.454	0.163	0.006*
Problems seeing	0.105	0.187	0.577	−0.262	0.601	0.663	−0.441	0.831	0.597
Problems hearing	0.699	0.198	0.001*	0.452	0.608	0.459	−0.184	1.096	0.867
At least 1 ADL	0.509	0.212	0.018*	0.216	0.674	0.749	1.149	0.987	0.247
At least 1 IADL	0.127	0.245	0.604	0.920	0.682	0.180	−0.178	0.862	0.837
Poor cognitive function	0.889	0.256	0.001*	0.693	0.805	0.391	1.295	0.646	0.048*
Problems concentrating	0.687	0.355	0.056	−0.260	0.801	0.746	2.224	0.986	0.026*
Adequate literacy	−0.613	0.321	0.059	−1.645	0.842	0.054	−2.985	0.943	0.002*
Access to care									
Trouble getting care	−0.837	0.513	0.105	−0.313	1.362	0.819	−0.548	1.447	0.706
Delayed getting care	0.274	0.413	0.508	−1.071	0.967	0.271	−0.393	1.609	0.807

Table 24. Generalized Linear Model Predicting Health Information Seeking by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
<i>Supplemental insurance (ref. public/FFS)</i>									
Medicaid	0.077	0.450	0.865	1.160	0.700	0.101	0.874	1.204	0.469
HMO	−1.195	0.388	0.003*	−1.545	1.045	0.142	0.423	1.192	0.724
ESI	−1.941	0.320	0.000*	−1.925	0.936	0.042*	0.903	1.327	0.498
Tricare/Medigap	−1.570	0.274	0.000*	−3.043	0.958	0.002*	−0.119	1.424	0.933
Constant	26.154	1.319	0.000	29.575	2.985	0.000	28.296	4.751	0.000
N	7,212			841			677		

**p* < 0.05

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily life; MSA = metropolitan statistical area; N = number; ref. = reference group

Based on these regressions, the predicted health information-seeking score is 21.5 points for white beneficiaries and 24.7 points for black beneficiaries (Table 25). If whites had the same average characteristics as blacks and the affects of characteristics stayed as they currently are for whites, their average health information-seeking score would increase to 23.3. Although whites' scores would increase by 1.8 points (poorer health information seeking), this score is still lower than the average blacks' score of 24.7. The difference in health information-seeking scores of white beneficiaries, given black characteristics, and blacks, given black characteristics, is -1.4 points. This result reflects unexplained racial difference on health information-seeking scores. White beneficiaries with characteristics typical of a black person should experience health information-seeking scores that are 1.4 points lower than a black person's score with the same characteristics. Therefore, racial differences lead to whites having better health information seeking than blacks because a lower score means better health information seeking. The health information-seeking case is interesting because differences in characteristics (explained differences) have a larger effect on health information seeking than unexplained racial differences.

There are similar patterns between whites and Hispanics. The predicted health information-seeking score for Hispanics was 25.0. When comparing the health information-seeking score of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the scores are 21.5 and 23.5, respectively, resulting in a difference in scores of 2 points. This result indicates that the differences in characteristics of Hispanic and whites (explained differences) should lead whites to have a health information-seeking score 2 points higher than if they had Hispanic characteristics. The difference in health information-seeking scores of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is -1.6 points. This result reflects the unexplained ethnic difference in health information-seeking scores. White beneficiaries with characteristics typical of a Hispanic person should experience health information-seeking scores that

are 1.6 points lower than a Hispanic person with the same characteristics. Therefore, ethnic differences lead to whites having better health information seeking than Hispanics because lower scores mean better health information seeking. As with the black and white comparison, explained racial differences contribute more to the gap in health information seeking seen between whites and Hispanics.

Table 25. Decomposition of Source of Differences in Health information-seeking Scores

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence [(2)–(3)])	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	21.5	23.3	24.7	–1.4	1.8
Hispanic	21.5	23.5	25.0	–1.6	2.0

Assertiveness

Table 26 contains the individual race/ethnicity models predicting assertiveness. Only 1 social–environmental variable predicted assertiveness in the white and black models. Blacks living in community housing had lower assertiveness; scores increased by 2.728 points ($p < 0.05$). Having no living children was associated with being less assertive in whites; scores increased by 1.065 points ($p < 0.01$). Several social environmental variables predicted assertiveness in Hispanics. Being married and living alone were associated with being more assertive. Scores decreased by 2.967 points ($p < 0.01$) and 2.501 points ($p < 0.01$), respectively. Hispanics were less assertive if their physicians did not show compassion (coef. = 2.123, $p < 0.05$). The differences did not exceed the MID (3.47–4.55 points).

The relationships between the control variables and assertiveness differed across racial/ethnic groups. In the white subgroup, beneficiaries were less assertive as they aged, if they had low incomes, IADLs, poor cognitive function, and problems concentrating. White beneficiaries with more comorbid conditions and adequate literacy were more assertive. Among blacks, beneficiaries with low incomes were less assertive, while beneficiaries with an increasing number of comorbid conditions were more

assertive. Two control variables predicted assertiveness in Hispanics. Beneficiaries with adequate literacy and ADLs were more assertive.

The Chow test was significant; therefore, there is sufficient evidence to suggest that regressor effects were significantly different across racial/ethnic groups. Only 2 variables differed across models, neither of which were social environmental variables. The effect of age was significant and decreased assertiveness in whites; however, it was not significant in blacks (0.069 vs. 0.024, $p < 0.01$) and Hispanics (0.069 vs. 0.008, $p < 0.01$). The coefficients on number of comorbid conditions were significantly different between blacks and whites. Both blacks and whites were more assertive as their comorbidities increase; the effect was stronger in blacks (−0.159 vs. −0.316, $p < 0.05$).

Table 26. Generalized Linear Model Predicting Assertiveness by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
Social environment									
Thorough	0.211	0.391	0.592	−0.472	1.355	0.728	−3.024	2.571	0.243
Confident	−0.146	0.390	0.708	1.895	1.347	0.163	1.705	2.000	0.423
Lacks compassion	0.125	0.548	0.820	−0.154	1.175	0.896	2.123	1.054	0.047*
Hurried care	0.317	0.243	0.195	1.150	0.714	0.112	0.853	0.924	0.358
Content knowledge	−0.164	0.595	0.784	−0.926	1.548	0.552	2.420	1.673	0.152
Concerned	0.318	0.553	0.566	−0.090	1.469	0.951	−0.207	1.929	0.915
Married	−0.333	0.282	0.239	−0.187	0.799	0.816	−2.967	1.066	0.006*
Lives alone	−0.131	0.284	0.647	−0.491	0.666	0.462	−2.501	0.878	0.005*
<i>Number of children alive (ref. > 2 children)</i>									
No children alive	1.065	0.351	0.003*	1.176	0.868	0.178	1.214	1.237	0.329
One kid living	0.112	0.265	0.672	0.586	0.837	0.485	0.734	0.932	0.433
Two children living	−0.208	0.199	0.298	0.080	0.660	0.903	−1.186	0.779	0.131
Takes helper to the doctor	0.024	0.190	0.899	0.416	0.570	0.467	−0.515	0.546	0.348
Lives in community housing	−0.230	0.331	0.490	2.728	1.214	0.027*	1.527	1.358	0.264
MSA	0.043	0.377	0.909	−1.018	0.550	0.067	1.045	0.973	0.285
Sociodemographics									
Age in years	0.069	0.012	0.000*	0.024	0.025	0.337	0.008	0.028	0.780
Male	0.172	0.171	0.317	1.108	0.635	0.084	−0.161	0.553	0.772
Employed	−0.203	0.270	0.454	0.675	0.764	0.379	0.715	0.969	0.462

High school graduate	−0.525	0.314	0.098	−1.215	0.682	0.078	0.602	0.735	0.415
Income < \$25	0.790	0.195	0.000*	2.310	0.707	0.001*	0.885	0.774	0.255
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	−0.543	0.338	0.111	−1.105	0.842	0.193	−0.917	0.820	0.266
Good	−0.251	0.310	0.420	−0.303	0.697	0.665	−0.853	0.710	0.233
<i>Health status compared to last year (ref. worse)</i>									
Better	−0.273	0.344	0.429	−0.074	0.895	0.934	1.206	0.922	0.194
Same	0.144	0.250	0.565	0.277	0.632	0.662	1.197	0.710	0.095
Number of disease	−0.159	0.046	0.001*	−0.316	0.125	0.013*	0.106	0.130	0.419
Problems seeing	0.132	0.205	0.521	0.501	0.455	0.274	−0.097	0.596	0.871
Problems hearing	0.476	0.270	0.081	0.659	0.579	0.257	1.163	0.850	0.174
At least 1 ADL	−0.161	0.225	0.477	−0.676	0.688	0.328	−1.937	0.810	0.019*
At least 1 IADL	0.550	0.221	0.014*	−0.057	0.831	0.945	−0.257	0.847	0.762
Poor cognitive function	0.618	0.266	0.022*	−0.415	0.608	0.496	0.147	0.583	0.801
Problems concentrating	0.985	0.351	0.006*	0.362	0.695	0.604	−0.457	0.628	0.468
Adequate literacy	−0.685	0.257	0.009*	−1.041	0.886	0.242	−3.482	0.852	0.000*
Access to care									
Trouble getting care	0.081	0.533	0.880	−1.226	1.139	0.284	−0.274	1.070	0.798
Delayed getting care	−0.121	0.371	0.745	−0.072	0.897	0.936	−0.504	0.982	0.609
<i>Supplemental insurance (ref. public/FFS)</i>									
Medicaid	−0.074	0.405	0.855	−0.152	0.793	0.849	0.035	0.799	0.965
HMO	−0.562	0.352	0.114	1.686	0.906	0.066	−0.223	1.010	0.826

ESI	−0.384	0.299	0.201	−0.413	0.910	0.651	−0.319	1.095	0.772
Tricare/Medigap	−0.385	0.283	0.176	−0.648	0.966	0.504	−0.454	1.401	0.747
Constant	13.128	1.250	0.000	16.097	2.946	0.000	18.132	4.099	0.000
N	7,212			841			677		

* $p < 0.05$.

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; ref. = reference group; SCSE = self-care self-efficacy

Based on these regressions, the predicted assertiveness score is 17.3 points for white beneficiaries and 17.3 points for black beneficiaries (Table 27). If whites had the same average characteristics as blacks and the affects of characteristics stayed as they currently are for whites, their average assertiveness score would increase to 17.4. An increase whites' scores by 0.1 points (poorer assertiveness) would result in slightly poorer assertiveness than blacks' scores. This result reflects differences in characteristics between blacks and whites. The difference in assertiveness scores of white beneficiaries, given black characteristics, and blacks, given black characteristics, is 0.1 points. This result reflects the unexplained racial differences in assertiveness scores. Thus, no racial differences in assertiveness exist between blacks and whites.

Similar patterns exist between whites and Hispanics. The predicted assertiveness score for Hispanics was 17.8. When comparing the assertiveness score of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the scores are 17.3 and 17.9, respectively, resulting in a difference in scores of 0.5 points. This result indicates that the differences in characteristics of Hispanic and whites should lead whites to have an assertiveness score 0.5 points higher if they had Hispanic characteristics. They would also have poorer assertiveness than Hispanics. The difference in assertiveness scores of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is 0.1 points. This result reflects the unexplained ethnic difference in assertiveness scores and does not contribute significantly to ethnic differences in assertiveness.

Table 27. Decomposition of Source of Differences in Assertiveness Scores

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	17.3	17.4	17.3	0.1	0.1
Hispanic	17.3	17.9	17.8	0.1	0.5

Overall Patient Activation

Table 28 contains the individual race/ethnicity models predicting overall PA. The community social environmental variables did not predict overall PA in any of the models. In the white subgroup, marriage was associated with better overall PA; on average scores decreased by 0.560 points ($p < 0.01$). Being childless, had an ill effect on overall PA as scores increased by 0.734 points ($p < 0.01$). Two patient-perception-of-physician variables predicted overall PA; however, they had opposite effects. Confidence in physicians improved overall PA (coef. = -0.785 , $p < 0.01$), while hurried care lowered it (coef. = 0.496 , $p < 0.001$). In blacks, the only social–environmental variable that predicted overall PA was hurried care; these beneficiaries were less activated (coef. = 1.148 , $p < 0.05$). Hispanics had better overall PA if they were married (coef. = -1.605 , $p < 0.01$), but lower overall PA if they felt their physician did not show compassion (coef. = 1.889 , $p < 0.05$).

The relationships between the control variables and overall PA differed across racial/ethnic groups. In the white subgroup, beneficiaries were less activated if male, aging, had incomes less than \$25,000, poor cognitive function, and problems seeing, hearing, and concentrating. They were most activated when high school graduates, in excellent health, with more comorbid conditions, adequate literacy, or enrolled in a HMO, ESI, Tricare, or Medigap. Blacks were less activated if male and if they had low incomes, but were more activated if they were high school graduates, if they had more comorbid conditions, and if they were enrolled in Tricare or Medigap. Low-income Hispanics were less activated, as were beneficiaries who had problems concentrating. Activation was highest among Hispanics beneficiaries with excellent health and adequate literacy.

The Chow test was significant suggesting the regressor effects were different across racial/ethnic groups. However, only two variables differed across models, neither of which were social environmental variables. The effect of age was significant, but did not improve activation in whites; however, it was not significant in blacks (0.034 vs. 0.028, $p < 0.05$) or Hispanics (0.034 vs. 0.020,

$p < 0.05$). The coefficients on number of comorbid conditions were significantly different between blacks and whites. Both blacks and whites had greater activation as their comorbidities increased, but the effect in blacks was stronger (-0.207 vs. -0.373 , $p < 0.05$). The difference was also significant between whites and Hispanics, but the number of diseases did not predict overall PA in Hispanics (-0.207 vs. -0.047 , $p < 0.05$).

Table 28. Generalized Linear Model Predicting PA Summary Score by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
Social environment									
Thorough	−0.379	0.238	0.114	−1.253	0.884	0.159	−2.787	1.542	0.074
Confident	−0.785	0.290	0.008*	0.593	0.825	0.474	1.515	1.207	0.230
Lacks compassion	0.442	0.325	0.177	−0.176	0.553	0.751	1.889	0.842	0.027*
Hurried care	0.496	0.128	0.000*	1.148	0.576	0.049*	0.079	0.660	0.904
Content knowledge	−0.490	0.362	0.179	−0.581	0.746	0.439	0.245	1.613	0.879
Concerned	−0.324	0.338	0.340	−0.959	0.795	0.231	−1.443	1.131	0.205
Married	−0.560	0.189	0.004*	−0.288	0.413	0.487	−1.605	0.547	0.004*
Lives alone	−0.367	0.178	0.041	0.141	0.410	0.732	−0.814	0.615	0.188
<i>Number of children alive (ref. > 2 children)</i>									
No children alive	0.734	0.221	0.001*	0.155	0.539	0.775	0.579	0.748	0.441
One kid living	0.034	0.158	0.829	−0.460	0.442	0.301	0.100	0.626	0.873
Two children living	−0.098	0.122	0.422	0.218	0.509	0.669	−0.830	0.473	0.083
Takes helper to the doctor	0.033	0.112	0.768	0.496	0.325	0.130	−0.759	0.416	0.071
Lives in community housing	0.091	0.270	0.736	1.373	0.842	0.106	−1.127	0.928	0.228
MSA	0.325	0.305	0.288	−0.385	0.412	0.353	0.722	0.976	0.461
Sociodemographic									
Age in years	0.034	0.007	0.000*	0.028	0.014	0.053	0.020	0.019	0.302
Male	0.992	0.101	0.000*	1.052	0.465	0.026*	0.609	0.367	0.101
Employed	0.147	0.158	0.354	0.397	0.518	0.445	0.235	0.738	0.751

Table 28. Generalized Linear Model Predicting PA Summary Score by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
High school graduate	−0.883	0.185	0.000*	−1.033	0.414	0.014*	−0.609	0.487	0.214
Income < \$25	0.740	0.136	0.000*	1.086	0.452	0.018*	1.229	0.515	0.019*
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	−0.709	0.188	0.000*	−0.870	0.545	0.114	−1.418	0.508	0.006*
Good	−0.261	0.156	0.096	0.553	0.507	0.278	−0.343	0.425	0.422
<i>Health status compared to last year (ref. worse)</i>									
Better	−0.410	0.212	0.056	−0.872	0.461	0.061	−0.139	0.617	0.822
Same	0.220	0.147	0.136	−0.013	0.418	0.976	−0.085	0.499	0.866
Number of disease	−0.207	0.028	0.000*	−0.373	0.082	0.000*	−0.047	0.088	0.590
Problems seeing	0.258	0.121	0.035*	0.683	0.352	0.055	−0.015	0.423	0.971
Problems hearing	0.630	0.124	0.000*	0.359	0.408	0.381	0.209	0.473	0.659
At least 1 ADL	0.221	0.124	0.077	−0.319	0.389	0.413	0.126	0.490	0.798
At least 1 IADL	0.254	0.142	0.077	−0.124	0.462	0.788	−0.312	0.524	0.552
Poor cognitive function	0.667	0.145	0.000*	0.657	0.495	0.188	0.065	0.383	0.866
Problems concentrating	0.958	0.196	0.000*	0.107	0.577	0.853	1.380	0.500	0.007*
Adequate literacy	−0.505	0.169	0.003*	−0.997	0.517	0.056	−2.191	0.615	0.001*
Access to care									
Trouble getting care	−0.288	0.330	0.384	−0.881	0.606	0.149	−0.290	0.708	0.683
Delayed getting care	0.241	0.216	0.268	0.227	0.554	0.683	−0.534	0.842	0.527

Table 28. Generalized Linear Model Predicting PA Summary Score by Race/Ethnicity

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
<i>Supplemental insurance (ref. public/FFS)</i>									
Medicaid	0.197	0.258	0.448	0.641	0.534	0.233	0.428	0.677	0.529
HMO	−0.460	0.206	0.027*	0.104	0.606	0.864	0.361	0.696	0.605
ESI	−0.683	0.180	0.000*	−1.081	0.573	0.062	0.109	0.803	0.892
Tricare/Medigap	−0.561	0.160	0.001*	−1.295	0.569	0.025*	−0.284	0.858	0.741
Constant	18.356	0.868	0.000	20.808	1.960	0.000	21.614	2.481	0.000
N	7,212			841			677		

**p* < 0.05

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; PA = patient activation; ref. = reference group

Based on these regressions, the predicted overall PA score is 17.9 points for white beneficiaries and 19.4 points for black beneficiaries Table 29. If whites had the same average characteristics as blacks and the affects of characteristics stayed as they currently are for whites, their average overall PA score would increase to 18.6. Although whites' scores would increase by 0.7 points (poorer overall PA), this score is still lower than the average blacks' score of 19.4. This result reflects differences in characteristics between blacks and whites. The difference in overall PA scores of white beneficiaries with the same average characteristics as blacks and blacks, given black characteristics, is -0.9 points. This result reflects unexplained racial difference (eg, discrimination) in overall PA. White beneficiaries with characteristics typical of a black person should experience overall PA scores that is 0.9 points lower than a black person with the same characteristics. Therefore, unexplained racial differences lead to whites having better overall PA than blacks because lower scores mean better overall PA. Explained and unexplained differences have a similar contribution to the racial differences seen in overall PA scores.

There are similar patterns between whites and Hispanics. The predicted overall PA score for Hispanics was 19.5. When comparing the overall PA score of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the scores are 17.9 and 18.8, respectively, resulting in a difference in scores of 0.9 points. This result indicates that the differences in characteristics of Hispanic and whites should lead whites to have an overall PA score 0.9 points higher than if they had Hispanics characteristics. The difference in overall PA scores of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is 0.7 points. This result reflects the unexplained difference in overall PA scores. White beneficiaries with characteristics typical of a Hispanic person should experience overall PA scores that is 0.7 points lower than a Hispanic person with the same characteristics. Therefore, ethnic differences lead to whites having better overall PA than Hispanics.

Table 29. Decomposition of Source of Differences in Overall PA Scores

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	17.9	18.6	19.4	–0.9	0.7
Hispanic	17.9	18.8	19.5	–0.7	0.9

Summary of Aim 3 Hypotheses for Patient Activation

Joint Significance

The joint significance of the social environmental variables was tested for the PA domains and overall PA across all the racial/ethnic groups. As a whole, these variables did not consistently predict the PA domains or overall PA across the racial/ethnic groups. Currently no examples exist in the literature of race-stratified models to which to compare these results.

The social environmental variables did not collectively influence self-care self-efficacy in blacks or Hispanics, but were jointly significant for white beneficiaries. Similarly, when looking at the individual groups of social–environmental variables, I found that patient-perception-of-physician and social-support variables did not collectively influence self-care self-efficacy in blacks and Hispanics; however, it did for whites. The community social environmental variables did not collectively influenced self-care self-efficacy for any racial/ethnic group.

The social environmental variables jointly influenced physician communication for each racial/ethnic group. In terms of the individual types of social environmental variables, patient-perception-of-physician variables collectively influenced physician communication across each racial/ethnic group; however, the social support variables collectively influenced physician communication only in the Hispanic model. The community social environmental variables did not collectively influence physician communication in any racial/ethnic model.

In the test of joint significance for predictors of health information seeking, I found the social

environmental variables collectively influenced health information seeking in the white and Hispanic models, but not the black model. Although the patient-perception-of-physician variables did not jointly influence health information seeking in any group, social support influenced health information seeking in the black and white models. Unlike the other PA domains, the community variables collectively influenced health information seeking in the Hispanic model.

The social environmental variables collectively influenced assertiveness in the Hispanic model, but not in the black or white models. Among the different types of social environmental variables, patient-perception-of-physician variables did not jointly predict assertiveness in any of the race/ethnic models. Social support was jointly significant of assertiveness in the Hispanic model, but not in blacks' and whites' models. The community variables were jointly significantly of assertiveness only in the black model.

Unlike the individual PA domains, Hibbard's study of social environmental variables and PA can be used to compare the results for overall PA for blacks and whites. Hibbard's study found scales measuring trust and social support predicted PA in blacks and whites.³³ In this study, the social environmental variables collectively influenced overall PA in each racial/ethnic model. When examining the different types of social–environmental variables, social support collectively influenced overall PA in the Hispanic model only. In Hibbard's work, social support predicted PA in both black and white. The difference in results might be due to differences in the way social support was measured in this study.⁶¹ I found that patient-perception-of-physician variables predicted overall PA in the black and Hispanic models. Patient-perception-of-physician variables were not measured directly in Hibbard's study; she found that trust was associated with PA in blacks and whites and, as mentioned previously, that trust is correlated with patient perceptions of physicians.⁷⁹ Lastly, the community social–environmental variables did not collectively influence overall PA in any model.

Strengths of Association

Patients' Perception of Physicians

Although the coefficients of the individual social–environmental variables varied across racial/ethnic group, the differences were not significant. I hypothesized that the relationship between patient-perception-of-physician variables and PA would be stronger in the white model than in the black or Hispanic models. There were very few opportunities to test this hypothesis because so few variables predicted the PA domains consistently across the different race/ethnic models. In the model predicting self-care self-efficacy, a lack of compassion was only significant in the black model. Similarly, hurried care was only a predictor in the white mode. In the physician-communication models, I observed the opposite of what was expected. The relationship between thorough care and physician communication was stronger in the black and Hispanics models than in the white model. Similarly, hurried care and concern were stronger predictors in the black model than in the white model. Unfortunately, in the health-information-seeking models, patient-perception-of-physician variables were not consistently predictive across racial/ethnic groups. For instance, hurried care was only predictive of health information seeking in the white model and concern was only predictive in the Hispanic model. In the assertiveness models, a lack of compassion was significant in the Hispanic model only. Finally, in the overall PA models, I found that confidence individually influenced overall PA in the white model, while lack of compassion was significant only in the Hispanics model. Hurried care could be compared in the white and black models; I found the relationship between hurried care and overall PA was stronger in blacks than in whites. The direction of these hypotheses were based on Hibbard's study, which found that the relationship between trust and PA was stronger in whites.³³ The difference in results might be the result of different age groups being studied and having a more heterogeneous sample.

Social Support

I hypothesized that the relationship between social-support variables and PA would be

stronger in whites and Hispanics than in blacks, based on Hibbard's study that examined this relationship between blacks and whites.³³ In the model predicting self-care self-efficacy, taking a helper to the doctor was only significant in the black model. However, marriage predicted self-care self-efficacy in the white and Hispanic models. Although not hypothesized, marriage had a stronger relationship with self-care self-efficacy in the Hispanic model than in the white model. In the model predicting physician communication, number of children was only significant in the white model. In the model predicting health information seeking, being married and living alone was only significant in the white model, while number of children was only significant in the black model. Comparisons could not be made across the assertiveness models because being married and living alone were only significant in the Hispanic model, and number of children was only significant in the white model. In the overall PA models, number of children was only significant in the white model. As with the self-care self-efficacy domain, marriage was a stronger predictor of overall PA in Hispanics than in whites; however, this comparison was not one that I hypothesized. Hibbard's study did not include Hispanics, so there was no study with which to compare the relationship between social support and PA.³³

Community

I hypothesized that the relationship between community variables and PA would be stronger in blacks and Hispanics than in whites. The community variables were not significant in any of the self-care self-efficacy and physician-communication models. Living in community housing only predicted health information seeking in the Hispanics model, while it was predictive of assertiveness only in the black model. Neither of the community variables predicted overall PA. There were no examples in the literature with which to compare these results.

Summary

These results add to the literature because there is only 1 other study that compared the effect of social environmental variables on PA across racial groups.³³ This study differed in that it included

Hispanics, studied a different age group, and the respondents had different types of insurance. As expected, differences existed in the relationship between social environmental variables and PA across racial/ethnic groups. I expected that the relationships might be stronger or weaker between the racial/ethnic groups; however, more often than not, I observed variables being significant in 1 race/ethnic model, but in not another. Therefore, these results support the notion that interventions might need to be group specific because different variables predict PA across groups.

Predicting Information Behavior

Table 30 consists of the bivariate relationships of each variable of interest and control variable across racial/ethnic groups. The sample included 6,186 respondents overall: 5,131 white beneficiaries, 583 black beneficiaries, and 472 Hispanic beneficiaries. As with Aim 1, racial/ethnic differences existed in PA. Blacks were more likely to have lower self-care self-efficacy, physician communication, health information seeking, and overall PA than were whites. Hispanics had lower self-care self-efficacy, health information seeking, and overall PA than had whites. Although these differences existed, they were not large enough to be MID. No differences in PA between blacks and Hispanics were found.

The information related variables showed many racial/ethnic differences. Blacks were less likely to look for information than were whites (32.7% vs. 39.8%, $p < 0.05$). They were also less likely to use nonpreferred information channels than were whites (26.6% vs. 33.7%) and they used fewer information sources (0.5 vs. 0.7) than did whites. Blacks had different channel preferences than had whites. There were no differences in need for Medicare Part D information between blacks and whites. Blacks preferred to talk to people more often than did whites (43.6% vs. 52.8%) and they were less likely to prefer the Internet (10.4% vs. 6.4%). Blacks also had less access to information because of lower rates of adequate literacy (62.7% vs. 57.4%) and access to the Internet (49.2% vs. 26.6%). Blacks were less aware of Medicare discount cards (72.8% vs. 61.3%) and Medicare Part D in 2004 (73.7% vs. 58.8%) than were whites.

No differences existed in Medicare Part D information seeking between whites and Hispanics or blacks and Hispanics. However, Hispanics were less likely to use nonpreferred channels than were whites (28.6% vs. 33.7%). They expressed a greater need for information about Medicare Part D compared to whites (19.6% vs. 12.3%). Whites used a greater number of information sources than did Hispanics, who also did not have different channel preferences from whites or blacks. Hispanics were less aware of Medicare discount cards (72.8% vs. 56.5%) and Medicare Part D in 2004 (73.7% vs. 45.6%) than whites. They were also less likely to be aware of Medicare Part D than were blacks. Hispanics also had less access to information because of lower rates of adequate literacy (62.7% vs. 46.2%) and access to the Internet (49.2% vs. 27.0%), compared to whites. Their literacy levels were even lower than that of blacks.

Access to prescription drugs differed across the racial/ethnic groups. Blacks were less likely to use mail-order pharmacies (34.5% vs. 20.6%), get their medications from overseas (6.7% vs. 4.2%), or ask for generic medications (54.4% vs. 43.7%) than were whites. Blacks were more likely to take smaller doses of medications (9.2% vs. 15.0%) and skip doses (8.2% vs. 14.2%) than were white beneficiaries. Hispanics were less likely to use mail-order pharmacies (34.5% vs. 19.0%) or samples (52.9% vs. 43.6%) than were whites; however, they were more likely to get their medications from overseas (6.7% vs. 10.3%). Hispanics were more likely to get medications from overseas (10.3% vs. 4.2%) and ask for generic medications (54.5% vs. 43.7%) than were blacks. They were also more likely to take smaller doses of medications (9.2% vs. 13.7%), compare drug prices (22.7% vs. 26.9%), skip doses (8.2% vs. 14.9%), and have prescription drug coverage in 2005 than were white beneficiaries. Hispanic beneficiaries were also more likely to have prescription drug coverage than were blacks. They were less likely to use drug discount cards than were whites.

Table 30. Bivariate Relationships by Race/Ethnic Group

	White	Black	Hispanic
Variables	N = 5,131	N = 583	N = 472
PA			
SCSE mean (SE)	16.6 (0.18)	18.1 (0.37)*	18.7 (0.36)*
PC Mean (SE)	16.1 (0.18)	17.4 (0.34)*	16.5 (0.34)
HIS Mean (SE)	21.4 (0.17)	24.4 (0.36)*	24.9 (0.53)*
Assertiveness Mean (SE)	17.2 (0.16)	17.2 (0.40)	17.7 (0.44)
Overall Score Mean (SE)	22.5 (0.23)	25.7 (0.48)*	25.5 (0.65)*
Sociodemographics			
Age (SE)	73.6 (0.15)	69.2 (0.48)*	70.6 (0.53)*
Male	42.3%	35.8%*	39.0%
High school grad	79.4%	58.6%*	43.1%*^
Income < \$25K	50.8%	75.8%*	81.2%*
Employed	10.9%	10.3%	7.3%*
Married	56.6%	33.8%*	50.2%*^
Children alive			
None	9.2%	9.5%	7.50%
One	10.1%	13.4%*	9.90%
Two	27.0%	16.5%*	20.3%*
More than two	53.7%	60.6%	62.3%*
Lives alone	31.8%	38.8%*	22.2%*^
MSA	72.8%	82.8%*	89.7%*^
Information seeking behavior			
Looked For information	39.8%	32.7%*	35.2%
Did not find information	0.8%	~	~
Used a nonpreferred source	33.7%	26.6%*	28.6%*
Information source count (SE)	0.7 (0.03)	0.5 (0.04)*	0.5 (0.04)*
Need			
Need prescription drug coverage information	12.3%	14.1%	19.6%*
Prior knowledge			
Medicare discount card	72.8%	61.3%*	56.5%*
Medicare Part D	73.7%	58.8%*	45.6%*^

Table 30. Bivariate Relationships by Race/Ethnic Group

	White	Black	Hispanic
Variables	N = 5,131	N = 583	N = 472
Access to information			
Adequate literacy	62.7%	57.4%*	42.6%*^
Access to the Internet	49.2%	26.6%*	27.0%*
Information channel preferences			
Type of channel preference			
Talk to a person	43.6%	52.8%*	47.9%
Brochure	67.9%	64.8%	65.7%
Internet	10.4%	6.4%*	7.4%
Media	38.6%	42.5%	39.1%
Other	0.4%	~	~
Mean number of channels (SE)	1.6 (0.04)	1.7 (0.09)	1.6 (0.05)
Number of preferences			
Zero	11.5%	14.4%	11.1%
One	35.9%	30.7%	35.4%
Two	34.9%	29.8%*	36.6%*
Three	15.9%	23.6%*	15.7%*
Four	1.9%	~	~
Physical and cognitive functioning			
Health status			
Excellent/very good	45.4%	29.5%*	30.6%*
Good	32.4%	35.3%	34.3%
Fair/poor	22.2%	35.2%*	35.1%*
Health compared to last year			
Better	14.8%	21.0%*	19.5%*
Same	64.4%	61.2%	59.2%*
Worse	20.8%	17.8%	21.3%
Difficulty seeing	27.8%	33.6%*	24.3% [^]
Difficulty hearing	34.9%	18.1%*	19.8%*
Problem with sight prevent learning about Medicare	7.3%	14.6%*	8.8% [^]
Problem with hearing prevent learning about Medicare	6.6%	5.3%	2.5%* [^]

Table 30. Bivariate Relationships by Race/Ethnic Group

	White	Black	Hispanic
Variables	N = 5,131	N = 583	N = 472
Total number of disease (SE)	4.0 (0.04)	3.7 (0.10)*	3.6 (0.11)*
No IADL	57.0%	54.5%	48.9%*
No ADL	72.6%	74.8%	68.4%^
Poor cognitive functioning	22.9%	22.6%	26.9%
Trouble concentrating	10.2%	11.8%	15.3%*
Makes own insurance decision	67.2%	70.1%	51.4%^
Access to care			
Trouble or delayed getting care	7.1%	11.6%*	7.80%
Supplemental insurance			
Medicaid	10.2%	30.9%*	43.6%^
HMO	14.9%	15.1%	20.0%
ESI	37.4%	27.3%*	19.7%^
Tricare/self-pay	29.6%	10.4%*	8.9%*
Public/FFS	8.0%	16.4%*	7.7%^
Access to prescription drugs			
Has not filled medications	3.7%	4.9%	3.3%
Uses mail order pharmacy	34.5%	20.6%*	19.0%*
Gets medications from outside of the United States	6.7%	4.2%*	10.3%^
Asks for generic medications	54.4%	43.7%*	54.5%^
Uses samples	52.9%	50.4%	43.6%*
Takes a smaller dose than prescribed	9.2%	15.0%*	13.7%*
Compares drug prices	22.7%	22.3%	26.9%*
Has skipped doses	8.2%	14.2%*	14.9%*
Had Rx coverage in 2005	69.2%	69.2%	75.6%^
Rx discount card	15.4%	13.3%	12.2%*
Medicare Rx Discount Card	4.7%	5.2%	3.4%

*p value for $t < 0.05$, blacks or Hispanics vs. whites; ^ p value for $t < 0.05$, blacks vs. Hispanics

ADL = activities of daily living; FFS = fee-for-service; ESI = employer sponsored insurance; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; Rx = prescription drug; SCSE = self-care self-efficacy; SE = standard error; ~ = less than 11 observations in cell

Regression Analyses

Again, I explored whether factors that had been found to be significant in the unstratified data were significant for blacks, whites, and Hispanics (stratified data). Some variables had too few observations for stable estimation, so those variables were not included in the models estimated (eg, getting medications outside the United States, and problems with seeing and hearing prevented them from learning about Medicare). However, where possible, variables were grouped together (eg, getting care and delaying care).

Medicare Part D Information Seeking

Table 31 contains the logistic regression models that predict information seeking by race/ethnicity, where all the PA domains are the predictors of interest. Different relationships between PA domains and Medicare Part D information seeking were observed across the races/ethnic groups. In the white beneficiaries' domain based model, both the self-care self-efficacy ($OR = 1.01, p < 0.05$) and health information-seeking PA domains ($OR = 0.98, p < 0.001$) predicted Medicare Part D information seeking. Poor self-care self-efficacy was associated with an increased probability of seeking Medicare Part D information. Alternatively, as health information-seeking scores increased (poorer activation), the probability of seeking Medicare Part D information decreased. If the self-care self-efficacy scores increased by 2.94 points (the MID for self-care self-efficacy) the odds of seeking would be 1.04 and if scores decreased by the same amount Medicare Part D information seeking would decrease by 3% ($OR = 0.97$). If health information-seeking scores increased by the MID (4.555 points), the odds of seeking would be 0.90 and, if scores decreased by the MID, Medicare Part D information seeking would increase by 11% ($OR = 1.11$).

Blacks also had lower odds of seeking Medicare Part D information if they were poor health-information seekers ($OR = 0.95, p < 0.01$). By increasing or decreasing the health information-seeking domain scores by the MID the odds of seeking Medicare Part D information would range from 0.78 to

1.28. In the Hispanic model, the opposite relationship between self-care self-efficacy and Medicare Part D information seeking was observed than in whites. People with poor self-care self-efficacy had lower odds of seeking Medicare Part D information (OR = 0.95, $p < 0.05$). If self-care self-efficacy scores increased by the MID the odds of Medicare Part D information seeking would fall to 0.85; however, if self-care self-efficacy improved by the MID (-2.94 points) the odds of seeking would increase to 1.18. Physician communication was also a predictor of Medicare Part D information seeking in the Hispanic model. Hispanic patients who experienced poor communication had greater odds of Medicare Part D information seeking (OR = 1.04, $p < 0.049$). Medicare Part D information seeking would increase by 12% if scores increased by the MID (2.63 points), but would decrease by 11% if physician-communication scores decreased by the MID.

The relationships between the control variables and Medicare Part D information seeking differed across racial/ethnic groups. Although very few control variables predicted Medicare Part D information seeking in Hispanics, many variables were predictive of Medicare Part D information seeking in whites. In the white subgroup, Medicare Part D information seeking occurred less often if beneficiaries had problems concentrating, had prescription drug coverage in 2005, and used mail order pharmacies. White beneficiaries with a job, more comorbid conditions, problems hearing, access to the Internet, a need for information, prior awareness of Medicare Part D, prescription discount cards, drug samples, who compared drug prices, or had problems accessing care were more likely to seek Medicare Part D information. Among blacks, Medicare Part D information seeking occurred less often if they were married; however, beneficiaries who were employed, had difficulty seeing, had access to the Internet, had a need for information, used prescription discount cards, asked for generic medications, or used drug samples were more likely to seek Medicare Part D information. Medicare Part D information seeking occurred more often with Hispanic beneficiaries who had access to the Internet and who skipped doses of their medication, but it was less likely to occur with beneficiaries who took

less medication than prescribed. The single biggest predictors of Medicare Part D information seeking for the white, black, and Hispanic models were the need for information, the use of prescription discount cards in 2005, and taking smaller doses than prescribed, respectively.

The Chow test was significant; indicating that some coefficients significantly differed by racial/ethnic group. Each of the PA domains differed between blacks and whites and Hispanics and whites. The effect of self-care self-efficacy was significant and increased Medicare Part D information seeking in whites, but was not significant in blacks (coef. = 0.014 v. -0.028, $p < 0.01$). self-care self-efficacy was significant in both the white and Hispanic models, but the direction of the effect was in opposite directions (coef. = 0.014 vs. -0.056, $p < 0.01$). The effect of physician communication on Medicare Part D information seeking was not significant in either whites or blacks; however, the difference in coefficients was significant (coef. = -0.006 vs. 0.001, $p < 0.05$). When comparing the effect of physician communication in the white and Hispanic models, physician communication significantly predicted Medicare Part D information seeking in Hispanics, but not whites, and the difference in coefficients was significantly different (coef. = -0.006 vs. 0.043, $p < 0.01$). The effect of health information seeking on Medicare Part D information seeking was weaker in the white model than in the black model (coef. = -0.024 vs. -0.054, $p < 0.01$). Although the effect of health information seeking was not significant in the Hispanic model, the difference in coefficients between the white and Hispanic models was significant (coef. = -0.024 vs. -0.010, $p < 0.01$). The effect of assertiveness on Medicare Part D information seeking was not significant for any of the subgroups; however, the difference in coefficients was significant between whites and blacks (-0.004 vs. -0.017, $p < 0.05$) and whites and Hispanics (-0.004 vs. 0.025, $p < 0.01$).

Other than PA domains, a few of the variables differed across the racial/ethnic groups. The coefficients on age significantly differed between whites and blacks (coef. = -0.007 vs. -0.011, $p < 0.05$) and whites and Hispanics (coef. = -0.007 vs. 0.004, $p < 0.01$), despite not being a significant

predictor of Medicare Part D information seeking. Although the number of comorbid conditions predicted Medicare Part D information seeking in whites, it did not in blacks, yet the coefficients were significantly different (0.042 vs. 0.089, $p < 0.05$). Similarly, the need for information was a predictor of Medicare Part D information seeking in the white model, but was not significant in the Hispanic model, and the coefficients were significantly different from one another (coef. = 1.082 vs. 0.060, $p < 0.05$).

Table 31. Logistic Regression Model Predicting Medicare Part D Information Seeking by Race/Ethnicity with Individual PA Domains

	White			Black			Hispanic		
	OR	95% CI	<i>p</i> Value	OR	95% CI	<i>p</i> Value	OR	95% CI	<i>p</i> Value
PA domains									
SCSE	1.01	[1.00, 1.03]	0.037*	0.97	[0.93, 1.02]	0.245	0.95	[0.90, 1.00]	0.036*
PC	0.99	[0.98, 1.01]	0.406	1.00	[0.96, 1.04]	0.961	1.04	[1.00, 1.09]	0.049*
HIS	0.98	[0.96, 0.99]	0.000*	0.95	[0.92, 0.98]	0.002*	0.99	[0.96, 1.02]	0.513
Assertiveness	1.00	[0.99, 1.01]	0.468	0.98	[0.95, 1.02]	0.307	0.98	[0.95, 1.01]	0.107
Sociodemographics									
Age in years	0.99	[0.99, 1.00]	0.114	0.99	[0.97, 1.01]	0.364	1.00	[0.98, 1.03]	0.749
Male	0.93	[0.80, 1.07]	0.311	1.01	[0.62, 1.67]	0.953	0.62	[0.34, 1.11]	0.104
Employed	1.40	[1.12, 1.77]	0.004*	2.36	[1.35, 4.13]	0.003*	1.67	[0.68, 4.13]	0.260
High school graduate	0.98	[0.80, 1.20]	0.849	1.02	[0.58, 1.78]	0.950	0.66	[0.30, 1.44]	0.291
Income < \$25	1.05	[0.89, 1.25]	0.555	0.97	[0.57, 1.66]	0.910	1.17	[0.56, 2.45]	0.673
Married	1.13	[0.95, 1.34]	0.180	0.47	[0.27, 0.84]	0.011*	1.28	[0.76, 2.15]	0.352
MSA	0.84	[0.65, 1.09]	0.188	0.83	[0.40, 1.75]	0.624	0.98	[0.45, 2.13]	0.957
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	1.09	[0.88, 1.34]	0.429	1.02	[0.50, 2.09]	0.954	1.57	[0.67, 3.68]	0.296
Good	1.16	[0.97, 1.38]	0.106	1.62	[0.93, 2.81]	0.086	1.00	[0.49, 2.02]	0.994

Table 31. Logistic Regression Model Predicting Medicare Part D Information Seeking by Race/Ethnicity with Individual PA Domains

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
<i>Health status compared to last year (ref. worse)</i>									
Better	1.12	[0.92, 1.38]	0.260	1.18	[0.60, 2.33]	0.632	0.78	[0.31, 1.92]	0.578
Same	0.97	[0.83, 1.14]	0.687	1.15	[0.60, 2.22]	0.676	0.59	[0.32, 1.06]	0.078
Number of disease	1.04	[1.01, 1.08]	0.026*	1.09	[0.97, 1.23]	0.131	1.08	[0.95, 1.24]	0.219
Problems seeing	1.10	[0.92, 1.32]	0.282	1.73	[1.07, 2.78]	0.024*	1.53	[0.89, 2.64]	0.124
Problems hearing	1.30	[1.11, 1.52]	0.002*	0.91	[0.44, 1.89]	0.802	1.19	[0.69, 2.07]	0.531
ADL	0.97	[0.81, 1.16]	0.731	1.47	[0.77, 2.78]	0.237	0.66	[0.38, 1.15]	0.141
IADL	1.02	[0.88, 1.18]	0.812	1.34	[0.81, 2.23]	0.247	1.20	[0.74, 1.94]	0.463
Poor cognitive function	1.01	[0.86, 1.18]	0.932	1.15	[0.56, 2.36]	0.696	0.49	[0.21, 1.14]	0.095
Problems concentrating	0.79	[0.65, 0.96]	0.019*	0.77	[0.30, 1.95]	0.574	1.66	[0.72, 3.83]	0.233
Makes own insurance decisions	0.86	[0.74, 1.01]	0.059	1.07	[0.61, 1.86]	0.821	1.12	[0.66, 1.88]	0.680
Access to information									
Has Internet access	1.34	[1.13, 1.58]	0.001*	1.95	[1.17, 3.25]	0.011*	2.02	[1.01, 4.02]	0.047*
Adequate literacy	1.12	[0.94, 1.33]	0.214	0.98	[0.58, 1.67]	0.949	1.04	[0.48, 2.23]	0.922
Need									
Needed information about Medicare Part D	2.95	[2.35, 3.71]	0.000*	2.46	[1.39, 4.35]	0.002*	1.05	[0.61, 1.83]	0.850

Table 31. Logistic Regression Model Predicting Medicare Part D Information Seeking by Race/Ethnicity with Individual PA Domains

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
Prior knowledge									
Discount card	1.09	[0.89, 1.34]	0.405	0.84	[0.46, 1.54]	0.572	1.37	[0.88, 2.11]	0.158
Medicare Part D	1.47	[1.20, 1.80]	0.000*	2.67	[1.28, 5.56]	0.009*	1.24	[0.79, 1.97]	0.347
Access to prescription drugs									
Rx coverage 2005	0.66	[0.54, 0.81]	0.000*	1.16	[0.65, 2.08]	0.604	1.18	[0.58, 2.39]	0.647
Rx discount card	1.97	[1.60, 2.42]	0.000*	3.59	[1.82, 7.08]	0.000*	1.80	[0.86, 3.75]	0.115
Uses mail order pharmacy	0.74	[0.63, 0.86]	0.000*	0.67	[0.37, 1.19]	0.167	1.07	[0.55, 2.10]	0.833
Asks for generic medications	1.07	[0.90, 1.26]	0.447	1.79	[1.11, 2.90]	0.018*	1.37	[0.76, 2.48]	0.289
Uses samples	1.27	[1.08, 1.49]	0.004*	1.78	[1.15, 2.77]	0.010*	1.44	[0.88, 2.37]	0.144
Takes a smaller dose than prescribed	1.14	[0.78, 1.67]	0.487	0.76	[0.22, 2.64]	0.660	0.15	[0.03, 0.71]	0.017*
Compares drug prices	1.43	[0.18, 1.75]	0.000*	1.21	[0.61, 2.40]	0.590	1.13	[0.60, 2.13]	0.701
Skips doses	1.24	[0.63, 1.32]	0.606	0.90	[0.34, 2.40]	0.832	6.26	[1.68, 23.4]	0.007*
Access to care									
Had trouble or delayed getting care	0.61	[1.09, 1.85]	0.011*	0.79	[0.36, 1.72]	0.545	1.05	[0.33, 3.30]	0.930
Supplemental insurance (ref. public/FFS)									
Medicaid	1.16	[0.85, 1.60]	0.348	1.24	[0.61, 2.52]	0.549	1.28	[0.37, 4.41]	0.697

Table 31. Logistic Regression Model Predicting Medicare Part D Information Seeking by Race/Ethnicity with Individual PA Domains

	White			Black			Hispanic		
	OR	95% CI	<i>p</i> Value	OR	95% CI	<i>p</i> Value	OR	95% CI	<i>p</i> Value
HMO	0.79	[0.58, 1.08]	0.133	0.61	[0.24, 1.55]	0.292	0.56	[0.16, 2.00]	0.365
ESI	0.75	[0.54, 1.04]	0.084	1.29	[0.55, 3.02]	0.556	1.24	[0.31, 4.98]	0.763
Tricare/Medigap	1.24	[0.96, 1.60]	0.096	1.19	[0.44, 3.25]	0.729	0.99	[0.28, 3.51]	0.991
N	5,131			583			472		

**p* value < 0.05

ADL = activities of daily living; CI = confidence interval; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; OR = odds ratio; PA = patient activation; ref. = reference group; SCSE = self-care self-efficacy

Based on these regressions, the predicted probability of Medicare Part D information seeking is 0.400 for white beneficiaries and 0.333 for black beneficiaries (Table 32). If whites had the same average characteristics as blacks and the effects of characteristics stayed as they currently are for whites, their average probability would decrease to 0.371. Although whites' probability would decrease by 0.028, this probability is still higher than the average blacks' probability of 0.333. This result reflects differences in characteristics between blacks and whites. The difference in probabilities between white beneficiaries with the same average characteristics as black beneficiaries and black beneficiaries, given black characteristics, is 0.039. Thus, white beneficiaries with characteristics typical of a black person should experience Medicare Part D information seeking at a rate 0.039 higher than should a black person with the same characteristics. Unexplained racial differences led whites to seek Medicare Part D information more often than did blacks.

There are similar patterns between whites and Hispanics. The predicted probability for Medicare Part D information in Hispanics was 0.347. When comparing the probabilities of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the probabilities are 0.400 and 0.359, respectively, resulting in a difference in probabilities of -0.041 . This result indicates that the differences in characteristics of Hispanic and whites should lead whites to have a probability of Medicare Part D information seeking 0.041 points lower than if they had Hispanics characteristics. The difference in probabilities of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is 0.012. This result reflects the unexplained ethnic difference in the probability of Medicare Part D information seeking between whites and Hispanics. Unexplained ethnic differences led to whites seeking Medicare Part D information more often than did Hispanics.

Table 32. Decomposition of Source of Differences in the Probability to Seek Medicare Part D Information in the PA Domain Models

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	0.400	0.372	0.333	0.039	–0.028
Hispanic	0.400	0.359	0.347	0.012	–0.041

Table 33 contains the logistic regression models that predict information seeking by race/ethnicity, where overall PA is the predictor of interest. Overall PA was a predictor of Medicare Part D information seeking in the white and black models, but not the Hispanic model. In the white beneficiaries' model, as overall PA scores increased (poorer activation), the probability of Medicare Part D information seeking decreased (OR = 0.97, $p < 0.01$). If scores increased by the MID (2.761 points), the odds of seeking would be 0.93 and, if scores decreased by the MID, information seeking would increase by 7% (OR = 1.07). Poor activation was also associated with lower seeking rates in blacks; however, the relationship was stronger (OR = 0.91, $p < 0.01$). If scores increased by the MID, the odds of seeking would be 0.76 and, if scores decreased by the MID (better activation), information seeking would increase by 32% (OR = 1.32).

As with the domain based models, the relationships between the control variables and Medicare Part D information seeking differed across racial/ethnic groups in the overall PA model. The same variables that were significant in this model were significant in the domain-based model. Again, the single biggest predictors of Medicare Part D information seeking for the white, black, and Hispanic models were need for information, use of prescription discount cards in 2005, and takes a smaller dose than prescribed, respectively.

The Chow test was significant, indicating that some coefficients significantly differed by racial/ethnic group. Overall PA differed between blacks and whites and Hispanics and whites. The

effect of Overall PA was significant in both the white and black models, predicting Medicare Part D information seeking, but the effect was stronger in the black model (coef. = -0.026 v. -0.099 , $p < 0.01$). Although not significant in the Hispanic model, the overall PA coefficients were significantly different in the white and Hispanic models (coef. = -0.026 vs. -0.051 , $p < 0.05$). As in the domain-based models, the age coefficients differed across all models. The coefficient on number of comorbid conditions differed between blacks and whites, while the coefficients on need for information were significantly different in the white and Hispanic models.

Table 33. Logistic Regression Model Predicting Medicare Part D Information Seeking by Race/Ethnicity with Overall PA Scores

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
PA domains									
PA summary score	0.97	[0.96, 0.99]	0.004*	0.91	[0.85, 0.96]	0.001*	0.95	[0.89, 1.01]	0.106
Sociodemographics									
Age in years	0.99	[0.99, 1.00]	0.183	0.99	[0.97, 1.01]	0.433	1.00	[0.99, 1.03]	0.785
Male	0.90	[0.78, 1.04]	0.171	0.97	[0.59, 1.60]	0.895	0.65	[0.36, 1.18]	0.159
Employed	1.39	[1.11, 1.74]	0.005*	2.33	[1.34, 4.06]	0.003*	1.36	[0.54, 3.43]	0.516
High school graduate	1.00	[0.82, 1.22]	0.989	1.02	[0.59, 1.79]	0.933	0.64	[0.30, 1.38]	0.251
Income < \$25	1.05	[0.88, 1.24]	0.594	0.95	[0.55, 1.65]	0.855	1.05	[0.51, 2.16]	0.900
Married	1.14	[0.96, 1.36]	0.130	0.49	[0.28, 0.85]	0.012*	1.24	[0.74, 2.09]	0.405
MSA	0.85	[0.66, 1.09]	0.204	0.83	[0.40, 1.70]	0.604	0.95	[0.46, 1.93]	0.878
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	1.06	[0.86, 1.31]	0.585	1.01	[0.50, 2.05]	0.981	1.54	[0.66, 3.58]	0.312
Good	1.15	[0.96, 1.37]	0.122	1.50	[0.87, 2.56]	0.140	0.99	[0.50, 1.97]	0.982
<i>Health status compared to last year (ref. worse)</i>									
Better	1.13	[0.92, 1.39]	0.242	1.25	[0.63, 2.51]	0.521	0.68	[0.27, 1.69]	0.398
Same	0.97	[0.82, 1.13]	0.670	1.14	[0.57, 2.27]	0.704	0.55	[0.31, 1.00]	0.051
Number of disease	1.05	[1.01, 1.09]	0.014*	1.11	[0.98, 1.25]	0.098	1.07	[0.95, 1.21]	0.272
Problems seeing	1.11	[0.93, 1.32]	0.263	1.75	[1.10, 2.77]	0.018*	1.42	[0.83, 2.42]	0.197
Problems hearing	1.32	[1.12, 1.54]	0.001*	0.91	[0.43, 1.89]	0.788	1.12	[0.66, 1.92]	0.669

Table 33. Logistic Regression Model Predicting Medicare Part D Information Seeking by Race/Ethnicity with Overall PA Scores

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
ADL	0.96	[0.80, 1.16]	0.678	1.52	[0.79, 2.90]	0.204	0.62	[0.36, 1.06]	0.078
IADL	1.03	[0.89, 1.19]	0.730	1.28	[0.77, 2.14]	0.336	1.12	[0.69, 1.81]	0.646
Poor cognitive function	1.01	[0.86, 1.18]	0.908	1.18	[0.58, 2.43]	0.643	0.54	[0.24, 1.19]	0.122
Problems concentrating	0.81	[0.66, 0.98]	0.034*	0.75	[0.30, 1.89]	0.536	1.56	[0.67, 3.62]	0.295
Makes own insurance decisions	0.86	[0.74, 1.01]	0.064	1.05	[0.61, 1.81]	0.853	1.15	[0.66, 2.01]	0.625
Access to information									
Has Internet access	1.34	[1.14, 1.5]	0.000*	1.92	[1.13, 3.25]	0.016*	1.98	[1.01, 3.91]	0.048*
Adequate literacy	1.12	[0.94, 1.33]	0.211	0.98	[0.59, 1.65]	0.948	1.10	[0.52, 2.31]	0.803
Need									
Needed information about Medicare Part D	2.98	[2.38, 3.73]	0.000*	2.55	[1.44, 4.53]	0.002*	1.10	[0.65, 1.84]	0.721
Prior knowledge									
Discount card	1.09	[0.89, 1.34]	0.411	0.86	[0.48, 1.54]	0.614	1.41	[0.92, 2.16]	0.109
Medicare Part D	1.46	[1.19, 1.78]	0.000*	2.53	[1.24, 5.17]	0.011*	1.25	[0.79, 2.00]	0.337
Rx coverage 2005	0.67	[0.54, 0.82]	0.000*	1.17	[0.64, 2.14]	0.600	1.04	[0.51, 2.11]	0.908
Rx discount card	1.98	[1.61, 2.44]	0.000*	3.20	[1.62, 6.32]	0.001*	1.62	[0.77, 3.41]	0.200
Uses mail order pharmacy	0.74	[0.63, 0.87]	0.000*	0.70	[0.40, 1.24]	0.223	1.00	[0.52, 1.92]	0.999
Asks for generic medications	1.08	[0.91, 1.28]	0.352	1.77	[1.08, 2.91]	0.024*	1.30	[0.72, 2.33]	0.377
Uses samples	1.27	[1.08, 1.50]	0.004*	1.77	[1.15, 2.72]	0.010*	1.56	[0.94, 2.58]	0.083

Table 33. Logistic Regression Model Predicting Medicare Part D Information Seeking by Race/Ethnicity with Overall PA Scores

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
Takes a smaller dose than prescribed	1.14	[0.78, 1.67]	0.487	0.77	[0.22, 2.78]	0.692	0.17	[0.04, 0.76]	0.021*
Compares drug prices	1.44	[1.18, 1.75]	0.000*	1.21	[0.60, 2.44]	0.582	1.18	[0.62, 2.25]	0.605
Skips doses	0.92	[0.63, 1.33]	0.651	0.95	[0.35, 2.57]	0.913	5.56	[1.49, 20.7]	0.011*
Access to care									
Had trouble or delayed getting care	1.43	[1.10, 1.87]	0.008*	0.78	[0.36, 1.69]	0.524	1.10	[0.36, 3.67]	0.860
Supplemental insurance									
Medicaid	1.19	[0.87, 1.63]	0.276	1.14	[0.56, 2.31]	0.713	1.45	[0.43, 4.94]	0.545
HMO	0.81	[0.60, 1.10]	0.174	0.62	[0.24, 1.64]	0.334	0.69	[0.19, 2.55]	0.575
ESI	0.78	[0.56, 1.07]	0.123	1.19	[0.53, 2.70]	0.668	1.43	[0.35, 5.82]	0.618
Tricare/Medigap	1.27	[0.99, 1.63]	0.055	1.17	[0.23, 1.64]	0.751	1.01	[0.29, 3.54]	0.994
N	5,131			583			472		

*p value < 0.05

ADL = activities of daily living; CI = confidence interval; ESI = employer sponsored insurance FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental ADL; MSA = metropolitan statistical area; N = number; PA = patient activation; OR = odds ratio; ref. = reference group

Based on these regressions, the predicted probability of Medicare Part D information seeking is 0.400 for white beneficiaries and 0.333 for black beneficiaries (Table 34). If whites had the same average characteristics as blacks and the effects of characteristics stayed as they currently are for whites, their average probability would decrease to 0.371. Although whites' probability would decrease by 0.028, this probability is still higher than the average blacks' probability of 0.333. This result reflects differences in characteristics between blacks and whites. The difference in probabilities of white beneficiaries with the same average characteristics as blacks and blacks, given black characteristics, is 0.040. This result reflects the impact of unexplained racial differences (eg, discrimination) on Medicare Part D information seeking. Thus, white beneficiaries with characteristics typical of a black person should experience Medicare Part D information seeking at a rate 0.040 higher than a black person with the same characteristics.

The predicted probability for Medicare Part D information in Hispanics was 0.347. When comparing the probabilities of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the probabilities are 0.400 and 0.361, respectively, resulting in a difference in probabilities of -0.039. This result reflects the explained difference in Medicare Part D information seeking between blacks and whites. The difference in probabilities of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is 0.014. This result reflects the unexplained ethnic difference in Medicare Part D information seeking. Thus, white beneficiaries with characteristics typical of a Hispanic person should seek Medicare Part D information at a rate of 0.014 points higher than would a Hispanic person with the same characteristics. Explained differences contribute more to the differences in Medicare Part D information between whites and Hispanics than unexplained differences.

Table 34. Decomposition of Source of Differences in the Probability of Medicare Part D Information Seeking in the Overall PA Model

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	0.400	0.371	0.333	0.040	–0.028
Hispanic	0.400	0.361	0.347	0.014	–0.039

Number of Sources of Information

Table 35 contains race/ethnicity specific count regression models that predict the number of sources of information used to learn about Medicare Part D. In these models, the PA domains are the predictors of interest. A ZINB model was used to estimate information source count in the model consisting of only white beneficiaries and, unlike the models from Aim 2, the inflated part of the model was significant. The expected number of information sources used was 0.706. The probability of using 1 information source was 0.229. It decreased to 0.097 for 2 sources and the probability was even lower for using 3 sources, 0.039. Poisson models were used to estimate information source count in the black and Hispanic models. The expected number of sources used to learn about Medicare Part D was lower in blacks than in whites. On average, blacks used only 0.520 information sources. The probability of using 1 information source was 0.243, 2 sources 0.082, and 0.029 for 2 sources. Similarly, Hispanics used 0.49 information sources to learn about Medicare Part D. Their probability of using 1 information source was 0.274, 2 sources 0.087, and 0.025 for 3 sources.

In both the white and black models, as health information seeking worsened (higher scores), beneficiaries used fewer information sources (white coef. = -0.014 , $p < 0.01$; black coef. = -0.035 , $p < 0.01$). The discrete changes associated with a half-SD change in health information-seeking scores were 0.067 for whites and 0.092 for blacks. However, in the Hispanic model, assertiveness predicted number of sources of information used to learn about Medicare Part D. Hispanic beneficiaries who

were less assertive (higher scores) used fewer information sources (coef. = -0.026 , $p < 0.01$). A half-SD discrete change resulted in a 0.068 change in the number of information sources used.

The relationships between the control variables and number of Medicare Part D information sources differed across racial/ethnic groups. In the white subgroup, the number of Medicare Part D information sources increased if beneficiaries were employed, married, had many comorbid conditions, problems seeing, Internet access, a need for information, prior awareness of Medicare Part D, used prescription discount cards, used samples, compared drug prices, had trouble getting care, enrolled in Tricare or Medigap, or had many information channel preferences. They used fewer information sources if they had prescription drug coverage in 2005. Different variables predicted the number of sources of information used in the black model. Blacks used fewer sources of information if they were married, but more sources if they had a need for information, prior knowledge of Medicare Part D, used discount cards, asked for generic medications, used drug samples, and had many information channel preferences. Fewer variables predicted the number of information sources used to learn about Medicare Part D in the Hispanic model. More information sources were used if Hispanic beneficiaries were married, skipped doses of medication, and had more information channel preferences, while the number of sources used were lower if their health was the same as the past year and if they had poor cognitive function. The single biggest predictors of the number of sources of information used to learn about Medicare Part D for the white, black, and Hispanic models were the need for information (discrete change = 0.347 information sources), use of prescription discount cards in 2005 (discrete change = 0.311 information sources), and skips doses (discrete change = 0.304 information sources), respectively.

The Chow test was significant; indicating that some coefficients significantly differed by racial/ethnic group. Each of the PA domains differed between blacks and whites. The only domain that did not differ between Hispanic and whites was health information seeking. The effect of self-care self-

efficacy was not significant in either whites or blacks, but the difference in coefficients was (coef. = 0.003 v. -0.006, $p < 0.05$). Similarly, self-care self-efficacy was not significant in the Hispanic model, but the difference in coefficients in the white and Hispanic models was significant (coef. = 0.003 vs. -0.011, $p < 0.01$). The effect of physician communication on number of sources of information was not significant in either the white or the black models; however, the difference in coefficients was significant (coef. = -0.003 vs. 0.001, $p < 0.05$). When comparing the effect of physician communication in the white and Hispanic models, physician communication predicted number of sources in neither model; however, the difference in coefficients was significantly different (coef. = -0.003 vs. 0.023, $p < 0.01$). The effect of health information seeking on number of sources of information used was weaker in the white model than in the black model (coef. = -0.014 vs. -0.035, $p < 0.01$). The effect of assertiveness on number of sources of information was not significant in either the white or black model; however, the difference in coefficients was significant between whites and blacks (-0.003 vs. -0.021, $p < 0.01$). Although not significant in the white model, assertiveness was significant in the Hispanic model. The difference in coefficients was also significant between whites and Hispanics (-0.003 vs. -0.026, $p < 0.01$).

A few variables other than PA domains differed across the racial/ethnic groups. The coefficients on age significantly differed between the whites and blacks, and whites and Hispanics, despite not being a significant predictor of the number of information sources used to learn about Medicare Part D. Marriage had the opposite effect on information source count in whites and blacks, and this difference was significant (0.167 vs. -0.336, $p < 0.05$). Although the number of comorbid conditions predicted number of information sources used in whites, it did not predict it in blacks; nevertheless, the coefficients were significantly different (0.026 vs. 0.039, $p < 0.05$). Similarly, the coefficients associated with prescription drug coverage in 2005 were significantly different between whites and blacks (-0.237 vs. 0.079, $p < 0.05$) despite this variable being predictive of information

source count in the white model only. The effect of using prescription discount cards was weaker in the white model than in the black model (0.246 vs. 0.709, $p < 0.05$). The effect of using prescription drug samples was also weaker in whites (0.106 vs. 0.361, $p < 0.05$). Number of comorbid conditions predicted information source count in the white model, but not the Hispanic model; nevertheless, the difference in coefficients was significant (0.026 vs. 0.055, $p < 0.05$). A difference in coefficients associated with stating a need for information was significantly different in the white and Hispanic models (0.450 vs. -0.150, $p < 0.05$) despite not being significant in the Hispanic model.

Table 35. Count Models Predicting Number of Information Sources Used by Race/Ethnicity with PA Domains

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
PA domains									
SCSE	0.003	0.005	0.550	−0.006	0.017	0.710	−0.011	0.015	0.468
PC	−0.003	0.004	0.502	0.001	0.011	0.963	0.023	0.014	0.101
HIS	−0.014	0.004	0.001*	−0.035	0.010	0.001*	−0.014	0.009	0.127
Assertiveness	−0.003	0.003	0.386	−0.021	0.011	0.069	−0.026	0.008	0.003*
Sociodemographics									
Age in years	0.000	0.003	0.874	−0.005	0.009	0.596	0.007	0.009	0.447
Male	−0.073	0.049	0.147	−0.178	0.170	0.299	−0.309	0.175	0.081
Employed	0.223	0.078	0.007*	0.145	0.203	0.478	0.341	0.329	0.302
High school graduate	0.040	0.066	0.546	0.158	0.182	0.386	−0.081	0.283	0.776
Income < \$25	0.076	0.052	0.152	0.055	0.153	0.720	0.055	0.217	0.800
Married	0.167	0.053	0.003*	−0.336	0.144	0.022*	0.287	0.138	0.041*
MSA	−0.083	0.068	0.226	0.121	0.216	0.578	−0.038	0.251	0.879
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	0.057	0.073	0.439	−0.198	0.248	0.427	0.422	0.270	0.122
Good	0.104	0.066	0.126	−0.030	0.162	0.853	0.179	0.205	0.385
<i>Health status compared to last year (ref. worse)</i>									
Better	−0.044	0.070	0.532	−0.182	0.197	0.358	−0.199	0.233	0.397
Same	−0.073	0.052	0.171	−0.094	0.183	0.608	−0.439	0.182	0.018*

Table 35. Count Models Predicting Number of Information Sources Used by Race/Ethnicity with PA Domains

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
Number of disease	0.026	0.010	0.016*	0.039	0.030	0.194	0.055	0.037	0.145
Problems seeing	0.133	0.057	0.025*	0.209	0.124	0.094	0.174	0.170	0.309
Problems hearing	0.005	0.045	0.909	0.164	0.201	0.416	-0.053	0.182	0.771
ADL	-0.020	0.069	0.776	0.265	0.186	0.158	-0.279	0.206	0.180
IADL	-0.006	0.054	0.913	-0.251	0.179	0.164	0.057	0.152	0.711
Poor cognitive function	-0.055	0.052	0.297	-0.066	0.197	0.739	-0.467	0.219	0.036*
Problems concentrating	-0.118	0.074	0.117	-0.159	0.277	0.568	0.327	0.219	0.139
Makes own insurance decisions	-0.086	0.043	0.055	-0.022	0.147	0.882	0.091	0.192	0.639
Access to information									
Has Internet access	0.130	0.047	0.009*	0.186	0.152	0.223	0.301	0.179	0.096
Adequate literacy	0.059	0.076	0.444	0.045	0.176	0.800	-0.233	0.275	0.398
Need									
Needed information about Medicare Part D	0.450	0.058	0.000*	0.354	0.156	0.026*	-0.150	0.175	0.395
Prior knowledge									
Discount card	0.081	0.059	0.175	0.057	0.207	0.785	0.313	0.172	0.073
Medicare Part D	0.237	0.063	0.001*	0.484	0.227	0.035*	0.049	0.150	0.745
Access to prescription drugs									
Rx coverage 2005	-0.237	0.063	0.000*	0.079	0.161	0.625	-0.059	0.175	0.735
Rx discount card	0.246	0.063	0.000*	0.709	0.185	0.000*	0.158	0.217	0.470

Table 35. Count Models Predicting Number of Information Sources Used by Race/Ethnicity with PA Domains

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
Uses mail order pharmacy	−0.090	0.058	0.128	0.065	0.152	0.671	−0.104	0.203	0.608
Asks for generic medications	0.100	0.051	0.058	0.387	0.162	0.019*	0.216	0.172	0.214
Uses samples	0.106	0.051	0.045*	0.361	0.149	0.017*	0.240	0.159	0.135
Takes a smaller dose than prescribed	0.000	0.119	0.999	−0.399	0.329	0.229	−0.212	0.380	0.579
Compares drug prices	0.147	0.058	0.016*	0.273	0.178	0.128	−0.015	0.180	0.936
Skips doses	−0.010	0.110	0.926	−0.020	0.274	0.942	0.652	0.296	0.030*
Access to care									
Had trouble or delayed getting care	0.187	0.086	0.036*	−0.038	0.214	0.860	−0.159	0.326	0.626
<i>Supplemental insurance (ref. public/FFS)</i>									
Medicaid	0.184	0.131	0.168	−0.027	0.191	0.888	0.418	0.324	0.200
HMO	0.050	0.147	0.738	−0.453	0.309	0.146	0.224	0.371	0.547
ESI	0.196	0.107	0.075	−0.045	0.270	0.868	0.295	0.406	0.469
Tricare/Medigap	0.238	0.094	0.015*	−0.032	0.205	0.877	0.101	0.325	0.757
Information channel preferences									
Number of preferences	0.290	0.031	0.000*	0.344	0.090	0.000*	0.247	0.068	0.000*
Constant	−1.191	0.306	0.000	−0.924	0.900	0.307	−1.884	0.815	0.023
<i>Inflated model</i>	OR	SE	p value						
Medicaid	0.448	1.658	0.788						
ESI	3.106	1.137	0.009*						
Tricare/Medigap	0.836	0.627	0.190						

Table 35. Count Models Predicting Number of Information Sources Used by Race/Ethnicity with PA Domains

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
Adequate literacy	−0.132	0.287	0.649						
HMO	2.389	1.092	0.035*						
Constant	−3.611	1.234	0.006						
N	5,131			583			472		

**p* value < 0.05

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental ADL; MSA = metropolitan statistical area; N = number; OR = odds ratio; PA = patient activation; PC = physician communication; ref. = reference group; SE = standard error; SCSE = self-care self-efficacy

Based on these regressions, the expected number of sources of information used was 0.706 for white beneficiaries and 0.520 for black beneficiaries (Table 36). If whites had the same average characteristics as blacks and the affects of characteristics stayed as they currently are for whites, their expected number of information sources would decrease to 0.644. Although the expected number of information sources for whites would decrease by 0.062, this result reflects differences in characteristics between blacks and whites. The difference in the number of sources of information used by white beneficiaries with the same average characteristics as blacks and the number used by blacks, given black characteristics, is 0.124. This result reflects unexplained racial differences (eg, discrimination). Unexplained racial differences led to whites to using more Medicare Part D information sources than did blacks.

The expected number of information sources used to learn about Medicare Part D was 0.491 in Hispanic beneficiaries. When comparing the difference in the expected number of information sources of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the average numbers of information sources are 0.706 and 0.600, respectively, resulting in a difference in expected values of -0.106 . This result indicates that the differences in characteristics of Hispanics and whites should lead whites to use 0.106 fewer information sources if they had Hispanics characteristics. The difference in the expected number of sources of information used by white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is 0.109. This result reflects the unexplained ethnic differences in the expected number of sources of information used. Unexplained ethnic differences led to whites using more Medicare Part D information sources than Hispanics.

Table 36. Decomposition of Number of Sources of Information Used in the PA Domain Based Model

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	0.706	0.644	0.520	0.124	–0.062
Hispanic	0.706	0.600	0.491	0.109	–0.106

Table 37 contains race/ethnicity specific count regression models that predict the number of sources of information used to learn about Medicare Part D. In these models, overall PA is the predictor of interest. As in the domain-based model, a ZINB model was used to estimate information source count in the model consisting of only white beneficiaries, while Poisson regression models were used to estimate information source count in the black and Hispanic models. The expected number of information sources used and the probabilities for using 1 or more information sources were virtually identical to the values produced in the domain-based model mentioned earlier.

In both the white and black models, as overall PA worsened (higher scores), beneficiaries used fewer information sources (white coef. = -0.019 , $p < 0.01$; black coef. = -0.067 , $p < 0.01$). However, in the Hispanic model, overall PA did not predicted number of sources of information used to learn about Medicare Part D. Discrete changes from the minimum to the maximum score in overall PA resulted in changes in information source counts of -0.322 and -0.559 for whites and blacks, respectively. The relationships between the control variables and number of Medicare Part D information sources differed across racial/ethnic groups. The same relationships observed in the domain-based models were observed in these models. One difference was observed in the Hispanic model. Skipping doses no longer predicted information source count.

Table 37. Count Models Predicting Number of Information Sources used by Race/Ethnicity with Overall PA

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
PA domains									
PA summary	−0.019	0.006	0.004*	−0.067	0.020	0.001*	−0.032	0.021	0.119
Sociodemographics									
Age in years	0.001	0.003	0.690	−0.002	0.008	0.806	0.006	0.009	0.464
Male	−0.086	0.048	0.083	−0.178	0.170	0.297	−0.297	0.171	0.086
Employed	0.221	0.076	0.006*	0.129	0.201	0.521	0.206	0.330	0.535
High school graduate	0.053	0.062	0.400	0.162	0.187	0.388	−0.084	0.275	0.760
Income < \$25	0.076	0.054	0.167	0.038	0.158	0.808	−0.006	0.214	0.979
Married	0.174	0.051	0.002*	−0.325	0.143	0.025*	0.277	0.137	0.046*
MSA	−0.080	0.072	0.273	0.114	0.218	0.603	−0.048	0.246	0.846
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	0.047	0.072	0.522	−0.212	0.250	0.399	0.433	0.267	0.108
Good	0.104	0.062	0.103	−0.076	0.159	0.634	0.188	0.200	0.350
<i>Health status compared to last year (ref. worse)</i>									
Better	−0.043	0.071	0.544	−0.169	0.203	0.406	−0.306	0.231	0.189
Same	−0.076	0.056	0.181	−0.097	0.193	0.615	−0.477	0.181	0.010*
Number of disease	0.028	0.011	0.012*	0.044	0.030	0.146	0.053	0.036	0.147
Problems seeing	0.137	0.057	0.022*	0.230	0.122	0.062	0.183	0.171	0.288
Problems hearing	0.010	0.048	0.841	0.147	0.202	0.471	−0.079	0.177	0.658

Table 37. Count Models Predicting Number of Information Sources used by Race/Ethnicity with Overall PA

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
ADL	−0.023	0.067	0.731	0.322	0.187	0.089	−0.307	0.192	0.114
IADL	0.000	0.053	0.996	−0.294	0.181	0.107	0.036	0.156	0.820
Poor cognitive function	−0.055	0.057	0.341	−0.034	0.194	0.863	−0.433	0.219	0.051
Problems concentrating	−0.107	0.072	0.149	−0.180	0.273	0.510	0.315	0.237	0.188
Makes own insurance decisions	−0.086	0.045	0.065	−0.027	0.143	0.852	0.111	0.207	0.593
Access to information									
Has Internet access	0.132	0.049	0.011*	0.193	0.155	0.214	0.309	0.181	0.092
Adequate literacy	0.060	0.073	0.412	0.052	0.170	0.761	−0.185	0.273	0.500
Need									
Needed information about Medicare Part D	0.454	0.059	0.000*	0.366	0.159	0.023*	−0.164	0.173	0.346
Prior knowledge									
Discount card	0.078	0.056	0.178	0.075	0.198	0.708	0.342	0.176	0.055
Medicare Part D	0.234	0.063	0.001*	0.448	0.223	0.047*	0.048	0.156	0.761
Access to prescription drugs									
Rx coverage 2005	−0.236	0.062	0.001*	0.069	0.159	0.667	−0.098	0.181	0.590
Rx discount card	0.246	0.060	0.000*	0.679	0.204	0.001*	0.084	0.219	0.703
Uses mail order pharmacy	−0.085	0.057	0.141	0.106	0.164	0.521	−0.103	0.207	0.619
Asks for generic medications	0.104	0.054	0.063	0.360	0.166	0.033*	0.216	0.173	0.216
Uses samples	0.109	0.050	0.037*	0.354	0.146	0.017*	0.274	0.162	0.096

Table 37. Count Models Predicting Number of Information Sources used by Race/Ethnicity with Overall PA

	White			Black			Hispanic		
	Coef.	SE	p Value	Coef.	SE	p Value	Coef.	SE	p Value
Takes a smaller dose than prescribed	−0.001	0.123	0.992	−0.391	0.306	0.205	−0.214	0.387	0.582
Compares drug prices	0.147	0.056	0.012*	0.277	0.182	0.131	−0.002	0.194	0.992
Skips doses	−0.007	0.110	0.950	0.036	0.244	0.885	0.604	0.317	0.060
Access to care									
Had trouble or delayed getting care	0.195	0.084	0.027*	−0.041	0.221	0.852	−0.103	0.314	0.744
<i>Supplemental insurance (ref. public/FFS)</i>									
Medicaid	0.199	0.129	0.131	−0.031	0.183	0.865	0.432	0.325	0.188
HMO	0.060	0.144	0.678	−0.421	0.317	0.187	0.284	0.384	0.462
ESI	0.218	0.108	0.050	−0.067	0.258	0.796	0.355	0.409	0.388
Tricare/Medigap	0.252	0.091	0.009*	−0.031	0.197	0.877	0.061	0.320	0.849
Information channel preferences									
Number of preferences	0.295	0.031	0.000*	0.345	0.088	0.000*	0.245	0.068	0.000*
Constant	−1.268	0.293	0.000	−1.093	0.874	0.214	−1.758	0.843	0.040
<i>Inflated model</i>	OR	SE	P value						
Medicaid	0.512	1.533	0.740						
ESI	3.048	1.131	0.011*						
Tricare/Medigap	0.819	0.600	0.181						
Adequate literacy	−0.128	0.288	0.660						
HMO	2.319	1.093	0.041*						
Constant	−3.540	1.209	0.006						

Table 37. Count Models Predicting Number of Information Sources used by Race/Ethnicity with Overall PA

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
N	5,131			583			472		

**p* value < 0.05

ADL = activities of daily living; Coef. = coefficient; ESI = employer sponsored insurance; FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; OR = odds ratio; PA = patient activation; ref. = reference group; SE = standard error

Based on these regressions, the expected number of sources of information used was 0.706 for white beneficiaries and 0.520 for black beneficiaries (Table 38). If whites had the same average characteristics as blacks and the effects of characteristics stayed as they currently are for whites, their expected number of information sources would decrease to 0.644. Although the expected number of information sources for whites would decrease by 0.062, this number of sources is still higher than the average number of sources used by blacks (0.520). This result reflects differences in characteristics between blacks and whites. The difference in number of sources of information used by white beneficiaries with the same average characteristics as blacks and blacks, given black characteristics, is 0.124. This result reflects unexplained racial differences (eg, trust, discrimination) between blacks and whites. Thus, white beneficiaries with characteristics typical of a black person should use 0.124 sources of information more than a black person with the same characteristics.

Similar patterns exist between whites and Hispanics. The expected number of information sources used to learn about Medicare Part D was 0.491 in Hispanic beneficiaries. When comparing the difference in the expected number of information sources of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the average numbers of information sources are 0.706 and 0.600, respectively, resulting in a difference in expected values of -0.106 . This result indicates that the differences in characteristics of Hispanic and whites should lead whites to use 0.106 fewer information sources if they had Hispanics characteristics. The difference in the expected number of sources of information used by white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, is 0.109. This result reflects unexplained ethnic differences in the expected number of sources of information used (eg, discrimination, spoken language). Thus, white beneficiaries with characteristics typical of a Hispanic person should use 0.109 more information sources than would a Hispanic person with the same characteristics.

Table 38. Decomposition of Number of Sources of Information Used in the PA Domain Based Model

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	0.706	0.644	0.520	0.124	–0.062
Hispanic	0.706	0.600	0.491	0.109	–0.106

Nonpreferred Channel Preference

A Heckman selection model was estimated for the white cohort. Rho was not significant; so logit models were used to estimate nonpreferred channel use in seekers. The Heckman model did not converge in the black and Hispanic cohorts, so logit models were estimated. The logit models were only estimated on the sample of beneficiaries who sought information about Medicare Part D. The sample consisted of 2,646 seekers, 2,046 of which were white, 196 blacks, and 156 Hispanics. Because of the reduced sample, variables were dropped from the analyses because there were too few observations (eg, MSA and trouble getting or delaying care).

Table 39 contains the logistic regression models that predict nonpreferred channel use by race/ethnicity where all PA domains were the predictors of interest. Different relationships between PA domains and nonpreferred channel use were observed across the race/ethnic groups. In the domain based model of white beneficiaries, the self-care self-efficacy domain (OR = 1.04, $p < 0.01$) predicted nonpreferred channel use. Poor self-care self-efficacy was associated with an increased probability of nonpreferred channel use. If self-care self-efficacy scores increased by 2.94 points (the MID for self-care self-efficacy) the odds of using a nonpreferred channel would be 1.22. If scores decreased by the same amount, using a nonpreferred channel to learn about Medicare Part D would decrease by 18% (OR = 0.82). None of the PA domains predicted nonpreferred channel use in the black cohort. In the Hispanic model, the health information seekers had lower odds of using a nonpreferred channel to learn about Medicare Part D (OR = 0.91, $p < 0.05$). If health information-seeking scores were to

increase by the MID (4.555 points) using a nonpreferred channel would decrease by 36% (OR = 0.64). Alternatively, if the scores increased by the MID the odds of using a nonpreferred channel would increase by 1.56.

The relationships between the control variables and nonpreferred channel use differed across racial/ethnic groups. No control variables predicted nonpreferred channel use in Hispanics. Interestingly, more control variables predicted nonpreferred channel use in blacks than in whites. In the white subgroup, using a nonpreferred channel to learn about Medicare Part D occurred more often if beneficiaries had problems hearing, made their own insurance decisions, used drug discount cards, and used many information sources to learn about Medicare Part D. Among blacks, nonpreferred channel use occurred less often if beneficiaries were employed, had a low income, were in excellent health, had an increasing number of comorbid conditions, had ADLs, made their own insurance decisions, and compared drug prices. They had greater odds of using a nonpreferred channel as they aged, if they had IADLs, had a need for Medicare Part D information, skipped medication doses, and used many information sources to learn about Medicare Part D. The single biggest predictors of nonpreferred channel use were the number of information sources used to learn about Medicare Part D and having at least one IADL for the white and black models, respectively.

The Chow test was not significant, indicating that there were no differences in coefficients across models; however, the p value was just over 0.05. Despite this finding, some variables did vary across models. The coefficients of three PA domains differed between blacks and whites, while only two differed between Hispanics and whites. The effect of self-care self-efficacy was significant and increased nonpreferred channel use in whites, but it was not significant in blacks; nevertheless, the difference in coefficients was significant (0.043 vs. -0.047, $p < 0.05$). No difference was found in the coefficients for self-care self-efficacy in the white and Hispanic models. However, the opposite was true with physician communication. No difference was found between coefficients in the white and black

models, but the difference was significant in the white and Hispanic models (-0.016 vs. -0.070 , $p < 0.05$). Health information-seeking coefficients were significantly different in both the white and black models (0.002 vs. -0.073 , $p < 0.05$) and the white and Hispanic models (0.002 vs. -0.098 , $p < 0.05$). Lastly, assertiveness coefficients were significantly different in the white and black models despite not significantly predicting nonpreferred channel use (-0.013 vs. 0.098 , $p < 0.05$). Other coefficients besides the PA domains differed across models. As with other analyses, the effect of age differed. The coefficient in the white model was not significant; however, it was significant in the black model (-0.013 vs. 0.098 , $p < 0.01$). Neither age coefficients were significant in the white and Hispanic models, but the difference was significant (-0.013 vs. -0.036 , $p < 0.05$). The effect of the number of comorbid conditions was significantly different in the white and black models (-0.001 vs. -0.214 , $p < 0.05$).

Table 39. Logistic Regression Models Predicting Nonpreferred Channel Use by Race/Ethnicity with PA Domain

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
PA domains									
SCSE	1.04	[1.01, 1.08]	0.007*	0.95	[0.83, 1.10]	0.503	1.05	[0.90, 1.22]	0.512
PC	0.98	[0.96, 1.01]	0.224	1.04	[0.89, 1.21]	0.639	0.93	[0.84, 1.03]	0.186
HIS	1.00	[0.98, 1.03]	0.856	0.93	[0.83, 1.05]	0.223	0.91	[0.84, 0.98]	0.019*
Assertiveness	0.99	[0.96, 1.01]	0.238	0.95	[0.87, 1.04]	0.276	0.98	[0.89, 1.07]	0.627
Sociodemographics									
Age in years	0.99	[0.97, 1.00]	0.133	1.10	[1.05, 1.16]	0.000*	0.96	[0.90, 1.03]	0.276
Male	1.02	[0.77, 1.35]	0.912	1.96	[0.57, 6.73]	0.286	2.08	[0.39, 11.2]	0.392
Employed	0.79	[0.50, 1.25]	0.314	0.11	[0.02, 0.74]	0.023*	0.46	[0.09, 2.33]	0.348
High school graduate	1.12	[0.76, 1.65]	0.562	2.38	[0.52, 11.0]	0.263	1.03	[0.11, 9.97]	0.978
Income < \$25K	0.93	[0.68, 1.26]	0.637	0.16	[0.04, 0.75]	0.020*	0.23	[0.02, 2.40]	0.218
Married	1.01	[0.75, 1.36]	0.949	0.20	[0.04, 1.02]	0.053	1.02	[0.26, 3.94]	0.980
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	1.23	[0.79, 1.91]	0.359	0.10	[0.01, 0.69]	0.020*	0.56	[0.09, 3.24]	0.515
Good	1.18	[0.79, 1.78]	0.412	0.40	[0.07, 2.18]	0.286	0.74	[0.24, 2.26]	0.591
<i>Health status compared to last year (ref. worse)</i>									
Better	0.97	[0.64, 1.48]	0.899	0.47	[0.04, 5.19]	0.535	1.79	[0.29, 11.0]	0.529
Same	1.09	[0.75, 1.56]	0.658	2.86	[0.38, 21.7]	0.308	0.43	[0.07, 2.69]	0.368
Number of disease	1.00	[0.94, 1.06]	0.973	0.81	[0.66, 0.99]	0.041*	1.09	[0.77, 1.55]	0.618

Table 39. Logistic Regression Models Predicting Nonpreferred Channel Use by Race/Ethnicity with PA Domain

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
Problems seeing	1.16	[0.81, 1.66]	0.420	0.74	[0.17, 3.14]	0.683	2.17	[0.84, 5.57]	0.108
Problems hearing	1.42	[1.04, 1.92]	0.027*	0.40	[0.11, 1.43]	0.159	1.64	[0.31, 8.58]	0.558
ADL	1.32	[0.90, 1.94]	0.153	0.24	[0.06, 0.92]	0.038*	0.41	[0.08, 2.08]	0.282
IADL	0.89	[0.64, 1.26]	0.515	12.69	[3.32, 48.4]	0.000*	0.68	[0.23, 2.01]	0.483
Poor cognitive function	0.95	[0.66, 1.37]	0.788	0.64	[0.15, 2.69]	0.536	0.40	[0.10, 1.54]	0.181
Problems concentrating	1.01	[0.59, 1.72]	0.968	0.93	[0.15, 5.60]	0.933	1.53	[0.30, 7.86]	0.608
Makes own insurance decisions	1.43	[1.02, 2.00]	0.038*	0.22	[0.06, 0.84]	0.027*	0.99	[0.38, 2.63]	0.992
Access to information									
Has Internet access	0.79	[0.58, 1.09]	0.148	2.19	[0.44, 11.1]	0.340	1.37	[0.35, 5.43]	0.652
Adequate literacy	1.11	[0.77, 1.60]	0.582	3.28	[0.35, 30.9]	0.297	1.34	[0.12, 14.7]	0.810
Need									
Needed information about Medicare Part D	1.12	[0.77, 1.61]	0.560	4.68	[1.37, 16.0]	0.014*	2.49	[0.78, 7.95]	0.124
Access to prescription drugs									
Rx coverage 2005	1.37	[0.98, 1.92]	0.069	3.05	[0.82, 11.4]	0.096	2.14	[0.46, 9.94]	0.330
Rx discount card	1.63	[1.12, 2.36]	0.010*	3.12	[0.55, 17.6]	0.197	0.58	[0.18, 1.88]	0.365
Uses mail order pharmacy	1.04	[0.74, 1.45]	0.825	0.31	[0.02, 4.98]	0.409	0.75	[0.11, 5.36]	0.776
Asks for generic medications	0.77	[0.57, 1.06]	0.112	2.58	[0.57, 11.8]	0.220	1.15	[0.27, 4.98]	0.850
Uses samples	1.21	[0.88, 1.67]	0.231	3.39	[0.61, 19.0]	0.164	0.18	[0.03, 1.04]	0.055
Takes a smaller dose than prescribed	1.23	[0.50, 3.02]	0.655	0.29	[0.01, 7.31]	0.453	2.61	[0.06, 109]	0.612

Table 39. Logistic Regression Models Predicting Nonpreferred Channel Use by Race/Ethnicity with PA Domain

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
Compares drug prices	1.15	[0.85, 1.57]	0.363	0.13	[0.03, 0.52]	0.004*	1.42	[0.34, 5.98]	0.627
Skips doses	0.90	[0.39, 2.06]	0.803	10.88	[1.18, 100]	0.035*	2.10	[0.27, 16.6]	0.478
Access to care									
<i>Supplemental insurance</i>									
Medicaid	0.71	[0.41, 1.21]	0.205	0.54	[0.08, 3.83]	0.534	2.78	[0.24, 32.5]	0.413
HMO	0.85	[0.46, 1.56]	0.605	3.30	[0.32, 33.7]	0.313	1.45	[0.04, 49.7]	0.836
ESI	1.08	[0.60, 1.95]	0.795	0.58	[0.67, 5.00]	0.620	2.34	[0.23, 23.3]	0.468
Tricare/Medigap	0.73	[0.47, 1.16]	0.182	0.17	[0.02, 1.23]	0.079	14.50	[0.85, 247]	0.064
Information sources									
Number of information sources	2.57	[1.81, 3.65]	0.000*	10.34	[1.06, 101]	0.044*	1.80	[0.33, 9.88]	0.499
N	2,046			196			156		

*p value <0.05

ADL = activities of daily living; CI = confidence interval; FFS = fee-for-service; ESI = employer sponsored insurance; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; OR = odds ratio; PA = patient activation; PC = physician communication; ref. = reference group; SCSE = self-care self-efficacy

Based on these regression models, the predicted probability of nonpreferred channel use is 0.845 for white beneficiaries and 0.797 for black beneficiaries (Table 40). If whites had the same average characteristics as blacks and the effects of characteristics stayed as they currently are for whites, their average probability would decrease to 0.839. Because this difference was so small, differences in characteristics between blacks and whites have very little impact on the actual differences observed in the probability of using a nonpreferred information channel. The difference in probabilities of white beneficiaries with the same average characteristics as blacks and blacks, given black characteristics, is 0.042. This result reflects the impact of unexplained racial differences on nonpreferred information channel use. Thus, white beneficiaries with characteristics typical of a black person should use nonpreferred information channels at a rate 0.042 higher than would a black person with the same characteristics. Unexplained racial differences led whites to use nonpreferred information channels more often than blacks.

The predicted probability for nonpreferred information channel use in Hispanics was 0.803. When comparing the probabilities of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the probabilities are 0.845 and 0.803, respectively, resulting in a difference in probabilities of -0.041 . This result indicates that the differences in characteristics of Hispanic and whites should lead whites to have a probability of using a nonpreferred information channel to learn about Medicare Part D 0.041 points less often than if they had Hispanics characteristics. The difference in probabilities of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, was 0.001. Since this difference was so small, differences in the probability of using a nonpreferred information channel are not explained by ethnic differences.

Table 40. Decomposition of Source of Differences in the Probability to Use a Nonpreferred Information Channel in the PA Domain Models

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	0.845	0.797	0.836	0.041	–0.006
Hispanic	0.845	0.803	0.803	0.001	–0.041

Table 41 contains the logistic regression models that predict nonpreferred channel use by race/ethnicity where overall PA was the predictor of interest. Different relationships between overall PA and nonpreferred channel use were observed across the race/ethnic groups, as overall PA was only significant in the Hispanic model. Poor activation was associated with a lower odds of using a nonpreferred information channel when learning about Medicare Part D (OR = 0.86, $p < 0.05$). If overall PA scores increased by 2.24 points (the MID for overall PA) the odds of using a nonpreferred channel would be 0.72. If scores decreased by the same amount, using a nonpreferred channel to learn about Medicare Part D would increase by 39% (OR = 1.39).

The relationships between the control variables and nonpreferred channel use differed across racial/ethnic groups. As in the domain-based model, fewer predictors existed in the white model than in the black model and, unlike the domain-based model, 1 control variable was found in the Hispanic model. In the white model, all control variables were the same except that making one's own insurance decisions was no longer a predictor. Similarly, there was only 1 change between the black model with overall PA and the domain based model, ADLs were no longer a predictor of nonpreferred channel use. The sole control variable in the Hispanic model was used drug samples; these beneficiaries had lower odds of using a nonpreferred channel preference. The single biggest predictors of nonpreferred channel use were the number of information sources used to learn about Medicare Part D, skipped doses, and uses samples for the white, black, and Hispanic models, respectively.

Again the Chow test was not significant; however, a handful of variables were found that significantly differed by race/ethnicity. The coefficients of overall PA differed between whites and blacks, and whites and Hispanics. The overall PA coefficients were significantly different in both the white and black models (0.010 vs. -0.130, $p < 0.05$) and the white and Hispanic models (0.010 vs. -0.149, $p < 0.05$). The only other variables that had variables that differed across models were age and number of comorbid conditions. The coefficient in the white model was not significant; however, it was in the black model (-0.013 vs. 0.097, $p < 0.01$). Neither age coefficients were significant in the white and Hispanic model, but the difference was (-0.013 vs. -0.043, $p < 0.05$). The effect of the number of comorbid conditions was significantly different in the white and black models (-0.005 vs. -0.212, $p < 0.05$).

Table 41. Logistic Regression Models Predicting Nonpreferred Channel Use by Race/Ethnicity with the Overall PA Summary Score

	White			Black			Hispanic		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
PA domains									
PA summary	1.01	[0.96, 1.06]	0.683	0.88	[0.76, 1.01]	0.076	0.86	[0.75, 0.99]	0.036*
Sociodemographics									
Age in years	0.99	[0.97, 1.00]	0.135	1.10	[1.05, 1.16]	0.000*	0.96	[0.91, 1.01]	0.119
Male	1.03	[0.78, 1.37]	0.831	2.01	[0.63, 6.42]	0.237	1.54	[0.38, 6.32]	0.547
Employed	0.82	[0.52, 1.29]	0.394	0.12	[0.02, 0.70]	0.019*	0.52	[0.12, 2.28]	0.380
High school graduate	1.12	[0.76, 1.64]	0.558	2.68	[0.61, 11.9]	0.191	1.32	[0.15, 11.3]	0.800
Income < \$25	0.91	[0.67, 1.24]	0.563	0.20	[0.04, 1.01]	0.051	0.25	[0.02, 2.50]	0.236
Married	1.00	[0.74, 1.35]	0.996	0.23	[0.04, 1.42]	0.113	1.18	[0.34, 4.15]	0.791
Physical and cognitive functioning									
<i>Health status (ref. fair/poor)</i>									
Excellent/very good	1.21	[0.78, 1.89]	0.392	0.11	[0.02, 0.55]	0.007*	0.49	[0.09, 2.66]	0.408
Good	1.19	[0.79, 1.79]	0.405	0.35	[0.08, 1.51]	0.160	0.55	[0.17, 1.83]	0.328
Better	0.96	[0.64, 1.45]	0.857	0.51	[0.05, 5.11]	0.566	1.86	[0.38, 9.14]	0.440
Same	1.07	[0.74, 1.54]	0.718	2.47	[0.42, 14.6]	0.318	0.61	[0.11, 3.24]	0.560
Number of disease	1.00	[0.94, 1.06]	0.885	0.81	[0.66, 0.99]	0.041*	1.16	[0.79, 1.69]	0.453
Problems seeing	1.18	[0.83, 1.68]	0.358	0.67	[0.16, 2.89]	0.592	2.02	[0.90, 4.50]	0.086
Problems hearing	1.47	[1.08, 2.00]	0.016*	0.51	[0.14, 1.88]	0.309	1.78	[0.45, 7.06]	0.409
ADL	1.32	[0.90, 1.93]	0.149	0.28	[0.07, 1.08]	0.065	0.55	[0.13, 2.41]	0.427
IADL	0.91	[0.65, 1.27]	0.573	10.34	[3.01, 35.5]	0.000*	0.64	[0.21, 1.93]	0.422

[illegible]

Table 41. Logistic Regression Models Predicting Nonpreferred Channel Use by Race/Ethnicity with the Overall PA Summary Score

	White			Black			Hispanic		
	OR	95% CI	<i>p</i> Value	OR	95% CI	<i>p</i> Value	OR	95% CI	<i>p</i> Value
Medicaid	0.73	[0.43, 1.24]	0.244	0.49	[0.07, 3.24]	0.457	2.01	[0.24, 16.6]	0.513
HMO	0.91	[0.50, 1.66]	0.756	4.84	[0.48, 49.0]	0.180	1.16	[0.08, 17.5]	0.915
ESI	1.11	[0.61, 2.01]	0.734	0.60	[0.08, 4.42]	0.611	1.66	[0.25, 11.1]	0.600
Tricare/Medigap	0.76	[0.48, 1.19]	0.224	0.18	[0.03, 1.15]	0.069	10.57	[0.71, 158]	0.087
Information sources									
Number of information sources	2.56	[1.81, 3.63]	0.000*	10.27	[1.16, 90.8]	0.036*	2.35	[0.61, 9.12]	0.215
N	2,046			196			156		

**p* value < 0.05

ADL = activities of daily living; CI = confidence interval; ESI = employer sponsored insurance; FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; N = number; OR = odds ratio; PA = patient activation; ref. = reference group; Rx = prescription drug

Based on these regressions, the predicted probability of nonpreferred channel use is 0.845 for white beneficiaries and 0.795 for black beneficiaries (Table 42). If whites had the same average characteristics as blacks and the effects of characteristics stayed as they currently are for whites, their average probability would decrease to 0.837. Although whites' probability would decrease by 0.008, this probability is still higher than the average blacks' probability of 0.795. Because this difference was so small, differences in characteristics between blacks and whites have very little impact on the actual differences observed in the probability of using a nonpreferred information channel. The difference in probabilities of white beneficiaries with the same average characteristics as blacks and blacks, given black characteristics, is 0.042. This result reflects the impact of unexplained racial differences on nonpreferred information channel use. Thus, white beneficiaries with characteristics typical of a black person should use nonpreferred information channels at a rate 0.042 higher than would a black person with the same characteristics. Unexplained racial differences led whites to use nonpreferred information channels more often than blacks.

The predicted probability for nonpreferred information channel use in Hispanics was 0.803. When comparing the probabilities of white beneficiaries, given their own characteristics, with white beneficiaries, given Hispanic characteristics, the probabilities are 0.845 and 0.803, respectively, resulting in a difference in probabilities of -0.044 . This result indicates that the differences in characteristics of Hispanic and whites should lead whites to have a probability of using a nonpreferred information channel to learn about Medicare Part D 0.044 points less often if they had Hispanics characteristics. The difference in probabilities of white beneficiaries, given Hispanic characteristics, and Hispanics, given Hispanic characteristics, was 0.006. This difference was very small; therefore, differences in the probability of using a nonpreferred information channel are not explained by ethnic differences.

Table 42. Decomposition of Source of Differences in the Probability to Use a Nonpreferred Information Channel in the Overall PA Model

	(1) White Population, White Model	(2) White Population, Minority Model	(3) Minority Population, Minority Model	Indirect Discrimination (Differences in Influence) [(2)–(3)]	Direct Discrimination (Differences in Characteristics) [(1)–(2)]
Black	0.845	0.795	0.836	0.042	–0.008
Hispanic	0.845	0.807	0.801	–0.006	–0.044

Summary of Aim 3 Hypotheses for Information Seeking Behavior

Joint Significance

The joint significance of the PA domains was tested for the information seeking behavior models across all the racial/ethnic groups. The PA domains collectively influenced Medicare Part D information seeking in the white, black, and Hispanic models. Similarly, they jointly influenced number of sources of information used to learn about Medicare Part D in each race/ethnic model. However, the PA domains did not collectively influence nonpreferred channel use in any of the models. Simply because the Medicare PA instrument has never been studied in domain form, this information is new and adds to the literature. In addition, no race/ethnic studies were found on the relationship between PA and any form of information seeking.

Strengths of Association

Medicare Part D Information Seeking

I hypothesized that the relationship between PA and Medicare Part D information seeking would be positive and stronger in the white model than in the black or Hispanic models. Very few opportunities to test this hypothesis existed because PA domains were not consistently predictive of Medicare Part D information seeking across the different race/ethnic models. Physician communication was only significant in the Hispanic model, while assertiveness was not predictive of information seeking in any model. Self-care self-efficacy was a predictor of information seeking in the white and

Hispanic models; however, the associations were not in the same direction. In the Hispanic model, poor self-care self-efficacy was associated with lower odds of seeking as predicted in Aim 2; however, in the white model, poor self-care self-efficacy was associated with more information seeking. One explanation of this result might be that white beneficiaries know that they are not good at taking care of themselves, so they seek help when needed. In addition, contrary to my hypothesis, the absolute magnitude of the relationship between self-care self-efficacy and Medicare Part D information seeking was stronger in the Hispanic model, rather than in the white model. The relationships observed with health information seeking and Medicare Part D information seeking were in the direction predicted; however, contrary to my hypothesis, the effect of health information seeking was stronger in the black model than in the white model. No direct examples were found in the literature for comparison; therefore, I assumed that the relationships would be stronger in the white model because PA associations were stronger in white models, looking at PA and health outcomes.³³ These results differ from Hibbard's; therefore, the effect of PA might differ by race depending on the outcome being study. In addition, the difference could be due to differences between this instrument and the PAM. A similar result was observed with overall PA, for it had a stronger effect in the black model.

When comparing these results to the pooled results in Aim 2, I found the relationship between health information seeking and Medicare Part D information seeking was consistent. However, no relationship was observed between self-care self-efficacy and Medicare Part D information seeking in the pooled model, although it was observed in the race/ethnicity models. This example provides justification for estimating race/ethnicity models. If they were not estimated, we would never have discovered that an opposing relationship existed in the white and Hispanic models that cancelled each other out once the data were pooled. Similarly, the relationship between physician communication and Medicare Part D information seeking in Hispanics was only observed once the models were stratified.

Number of Sources of Information

When assessing the relationship between PA and number of sources of information used to learn about Medicare Part D by race/ethnicity, I hypothesized that the relationship would be positive and stronger in the white model than in the black or Hispanic models. As with the information seeking models, very few opportunities existed to test this hypothesis because PA domains were not consistently predictive of the number of sources of information across the different race/ethnic models. Assertiveness was only significant in the Hispanic model, while self-care self-efficacy and physician communication were not predictive of the number of sources of information seeking used in any model. Health information seeking was a predictor of number of sources of information in the white and black models. Although better health information-seeking skills increased the number of sources of information used, the association was stronger in blacks. Similarly, the effect of overall PA on number of source of information used was stronger in blacks. By stratifying by race/ethnicity, I uncovered the relationship between assertiveness and number of sources of information observed in the Hispanic model, although it was not significant in the pooled model in Aim 2. The assumptions made about the strength of relationships were based on Hibbard's study that showed that whites had stronger relationships between PA and several health outcomes.³³

Nonpreferred Channel Use

As with the other information seeking behavior, I hypothesized that the relationship between PA and nonpreferred channel use would be positive and stronger in the white model than in the black or Hispanic models. Unfortunately, physician communication and assertiveness did not predict nonpreferred channel use in any model, self-care self-efficacy was only predictive of nonpreferred channel use in the white model, and health information seeking and overall PA were only predictive of nonpreferred channel use in the Hispanic model, so this hypothesis could not be tested. If only the pooled model was run, I would not have been able to show that self-care self-efficacy was predictive of

nonpreferred channel use in whites. In addition, I would have assumed that no relationships existed between health information seeking, overall PA, and nonpreferred channel use.

Summary

These results add to the literature because no studies exist that compare the effect of PA on information seeking behaviors across racial/ethnic groups. As expected, some differences were found in the relationship between PA and information seeking behaviors across racial/ethnic groups. I believed that relationships might be stronger in whites than in the other racial/ethnic groups. However, more often than not, I observed variables being significant in 1 race/ethnic model, but not other models. When these results are compared to the pooled results, I uncovered different patterns of association. This is the reason why some authors encourage race/ethnicity specific models.⁴⁶ In some cases, opposing relationships were observed; in other cases, new associations were observed or associations no longer existed and, still in other cases, differences in magnitude of effect were observed. The additional data from the stratified analyses provides evidence to support the creation of group specific interventions. These data also show that PA could be a target of interventions, specifically if related to Medicare Part D information seeking.

CHAPTER 6: DISCUSSION

The purpose of the this dissertation was to understand the effects of the social environment on PA and the effects of PA on Medicare Part D information seeking behaviors, and to determine whether these effects differ across racial/ethnic groups. This study helps address some gaps in the literature because, until now, very little research has been conducted on predictors of PA, specifically when measured with the Medicare PA instrument. Although many studies in the literature showed that high PA improves many health related outcomes, this study is the first study to take an in-depth look at associations between PA and information seeking as an outcome. In addition, until now, only 1 study has examined racial differences in predictors of PA or the relationship between PA and health related outcomes. This dissertation not only provides an additional example of racial differences, it goes a step further by examining variation by ethnicity. In the sections to follow, I present a summary of the findings, implications of the results, the major limitations and strengths of the study, and potential direction for future research.

Summary of Findings

Measuring PA

When examining the psychometric properties of the Medicare PA instrument, the results indicated that a better factor structure existed than the 5-factor structure offered by the developers of the instrument.³² As such, all the analyses of this dissertation were carried out using a 4-factor structure with the following domains: self-care self-efficacy, physician communication, assertiveness, and health information seeking. I also found that there was a hierarchical structure to these factors and that an overall score could be devised. Studying the domains of this instrument is a new addition to the

literature because, until now, the instrument has been used to identify clusters of patients.³² The ability to create a summary score allows this instrument to be compared to the frequently published PAM.

Predictors of Patient Activation

A plethora of research examines the relationship between PA and health related outcomes; however, studies of predictors of PA are limited in number. By studying the predictors of PA, possible targets for interventions were identified. PA is a multidimensional construct; therefore, variables that predict more than 1 domain would be the best targets for interventions. As a whole, very few social environmental variables predicted more than 1 PA domain. Among the patient-perception-of-physician variables, hurried care was associated with the most domains. Hurried care had a negative effect on self-care self-efficacy, physician communication, and overall PA, but actually led to more health information seeking. Thoroughness was associated with better physician communication, health information seeking, and overall PA. Competence was not associated with any PA domain. The remaining patient-perception-of-physician variables only predicted physician communication. These included confidence, lack of compassion, concern, and content knowledge; lack of compassion had a negative effect on communication. The significant relationships observed between the patient-perception-of-physician variables and PA followed the hypotheses of this dissertation.

In addition, social support variables could be targeted for interventions. Marital status was with associated 3 PA domains and overall PA. Married beneficiaries had higher levels of self-care self-efficacy, assertiveness, health information seeking, and overall PA. Being childless was associated with 2 PA domains and overall PA. Being childless was associated with poor physician communication, assertiveness, and overall PA. Taking a helper to the doctor was associated with 2 PA domains. Taking a helper to one's visit increased physician communication, but lowered self-care self-efficacy. Lastly, beneficiaries that lived alone tended to have better self-care self-efficacy and overall PA. A number of the relationships observed were not hypothesized. For instance, being childless was a predictor

physician communication and living alone had a positive effect on self-care self-efficacy and overall PA. Community social environmental variables, as measured in this dissertation, were not predictive of PA and might not be appropriate to be considered places of interventions.

Patient Activation as a Predictor of Information Seeking Behaviors

I assumed that PA would positively affect Medicare Part D information seeking. This was true for the only PA domain that predicted Medicare Part D information seeking, which was health information seeking. Similarly, overall PA was positively associated with Medicare Part D information seeking. In the models predicting the number of sources of information, positive relationships were observed with assertiveness and health information seeking. In addition, as overall PA improved, more information sources were used. The last information seeking behavior was nonpreferred channel preference use. Self-care self-efficacy was the only PA domain that predicted this outcome. Poor self-care self-efficacy was associated with higher rates of nonpreferred channel use. This relationship was not expected.

Racial and Ethnic Differences

From a simple descriptive standpoint, racial and ethnic differences were seen in PA domains and overall PA scores. Blacks consistently had lower levels of self-care self-efficacy, physician communication, and health information seeking than whites, whereas Hispanics beneficiaries had lower levels of self-care self-efficacy, health information seeking, and overall PA compared to white beneficiaries. Even in the multivariate models, a significant difference in PA domain scores remained. Interestingly, a significant difference in assertiveness scores arose, for, instead of blacks having lower levels, they had higher levels of assertiveness than had whites. Similarly, differences in self-care self-efficacy and health information seeking remained between whites and Hispanics after controlling for other variables; however, the difference in overall PA between these 2 groups no longer existed.

In addition to assessing average differences in this dissertation's outcomes by race/ethnicity, I also explored variation in the effects of predictor variables and outcomes. In most cases, there was an absence of a relationship in 1 group compared to another group, rather than a weaker or stronger relationship. For instance, when predicting self-care self-efficacy, hurried care was predictor in the white model, while lack of compassion was a predictor in the black model. Marriage had no effect in the black model, but it did have an effect for both the white and Hispanics models. Lastly, taking a helper to the doctor only had an effect in the black model. Differences were found in the effect of control variables across the different race/ethnic models. In the physician communication models, many different effects were found. Thorough care predicted physician communication in each model; however, the strength of this relationship was much stronger in the black and Hispanic models. Being confident, a lack of compassion, content knowledge, and being childless were predictors of physician communication only in the white model. Hurried care had a negative effect of communication in the white and black models, while concern improved communication in these models. In both cases, the relationship was slightly stronger in the black model. In the health information-seeking models, hurried care was only a predictor in the white model as was being married and living alone. Number of children was a predictor in the black model, while showing concern and living in community housing were predictors of health information seeking in the Hispanic model. When it came to assertiveness, many more predictors were found in the Hispanic model than the white or black models. A lack of compassion, marriage, and living alone were all predictors of assertiveness in that model. Being childless was the only social support variable that predicted assertiveness in the white model, while only living in community housing predicted assertiveness in the black model. In the overall PA models, confidence improved overall PA in whites, while having no children lowered overall PA. Among Hispanic beneficiaries, a lack of compassion lowered overall PA. Hurried care had a greater negative

effect on overall PA in blacks than it did in whites. Marriage predicted overall PA in both whites and Hispanics; the relationship was slightly stronger in Hispanics.

The racial/ethnic differences observed in PA domains are due to a combination of compositional or characteristic differences between racial/ethnic groups and effect differences between the independent variables and outcomes. Differences in effect are thought to be caused by discrimination or unobserved factors. Self-care self-efficacy scores differed because of differences in characteristics as well as effects (unexplained differences); however, effect differences were a larger contributor to the racial/ethnic score gap. Both characteristic differences and unexplained differences contributed to differences in physician communication between blacks and whites with possible discrimination having a larger impact on physician-communication differences. If differences were observed in physician communication between Hispanics and whites, they were due to differences in characteristics between the groups and not discrimination. Characteristic and effect differences both contributed to the gap in health information seeking between whites and blacks, and between whites and Hispanics; however, characteristic differences contributed slightly more. No real differences were found in assertiveness scores between the races and ethnic groups; therefore, the decomposition did not produce much information. Lastly, racial and ethnic differences in overall PA stem equally from both characteristic differences and effect differences.

Differences in the information-seeking behaviors were also observed. Blacks were less likely to look for Medicare Part D information, used fewer information sources, and were less likely to use a nonpreferred information channel than were whites. In the multivariate models, no difference between blacks and whites was observed in the Medicare Part D information seeking model or the nonpreferred channel use models; however, they remained in the model predicting number of sources of information. Hispanics used fewer information sources and were less likely to use a nonpreferred information

channel. Even after controlling for other variables Hispanics still used less information sources, but no longer differed from whites with respect to nonpreferred channel use.

The effect of PA did vary across each information behavior model by race\ethnicity. Self-care self-efficacy predicted Medicare Part D information seeking in both the white and Hispanic models, but the relationships were in opposite directions. Health information seeking had a positive effect on Medicare Part D information seeking in the white and black models. Poor physician communication was associated with more Medicare Part D information seeking in the Hispanic model. Poorer overall PA was associated with lower rates of Medicare Part D information seeking in both the white and black models. In my study of the number of sources of information used to learn about Medicare Part D, I found that health information seeking predicted more source use in both the white and black models and that the effect was greater in blacks. Similar relationships were observed with overall PA between these two groups. Assertiveness was only predictive of source count in the Hispanic model; Hispanics who were not assertive used fewer information sources. Lastly, in the nonpreferred channel use models, whites with poor self-care self-efficacy used nonpreferred sources more often, while poor health information seeking was associated with less nonpreferred channel use in Hispanics.

I attempted to decompose the source of the racial\ethnic differences in information seeking behaviors. Both characteristic and effect differences contributed to differences in Medicare Part D information seeking. In blacks, effect difference contributed more to the white–black difference, while characteristic differences contributed more to the white–Hispanic difference. Effect difference contributed more to differences in the number of sources of information used to learn about Medicare Part D between whites and blacks. Characteristic and effect differences contributed equally to any differences in source use observed between whites and Hispanics. Lastly, all differences observed between whites and blacks in nonpreferred channel use were attributed to differences in effects, while all differences observed between whites and Hispanics were attributed to characteristic differences.

Implications

The implications of this research are many. First, I studied the domains of the Medicare PA instrument. By doing so, I have added to the literature because, until now, the Medicare PA instrument has been used to identify clusters of patients.³² The domain-based approach allows the researcher to understand the relationship between PA and outcomes better than a cluster grouping would allow because clusters only classify patients. Also by creating a summary score, this instrument can be compared more easily to the frequently used PAM.

A recent study showed that patients with higher levels of activation have experiences that are more favorable with their care and their provider.¹⁴³ This dissertation provides a starting point for interventions that are aimed at improving PA. Interventions should target variables identified from this dissertation, especially those that affect multiple PA domains. For example, hurried care negatively affected several PA domains. Reducing the perception of hurried care can have benefits beyond PA because rushed visits are associated poor health outcomes and poor communication between patients and physicians.^{96, 144} In spite of the weaker relationship between hurried care and PA observed in blacks and in spite of the null relationship seen in Hispanics in this study, longer visits would benefit all patients because shortened visits can exacerbate racial health disparities.⁹⁶ In addition, many of the social programs in place to provide care for minority patients or the medically needy provide the lowest reimbursement and might put these patients at higher risk of rushed care.⁸⁹

Care is often rushed because the current payment model is driven by volume of services. Payers and policymakers should re-evaluate methods of compensation if they lead to providers shortening visit length to maintain revenue. If payers base payment on quality of performance and not volume, we might be able to increase visit times without having an ill effect on finances of the providers' practices. Education is needed for a patient to engage in self-care; therefore, lengthening visits can allow for more education. As a result, self-care self-efficacy could improve by increasing visit lengths.

Physician offices might need to change their workflow to reduce the feeling that care is hurried or rushed by having ancillary staff collect pertinent data from patients so time is more efficiently used when actually seeing the doctor.¹⁴⁵ In addition, time with the staff might allow patients to address issues that shorter visit times do not allow. Interventions could also target patients. Looking up and exchanging health information with one's doctor should not occur simply because visits seem rushed. These behaviors are important regardless of the length of a visit. Bringing a list of medications and even questions to the doctor is always important, just as reviewing information about medications filled at the pharmacy is important. These behaviors should be encouraged more frequently by providing examples of why such exchanges are needed (eg, Medicare Part D decision making).

Better physician communication and health information seeking and exchange was found when care was thorough. Interventions targeting hurried care can have an impact here because, once the length of visit is increased, the additional time might allow for care that is more thorough. In addition to having more time, patients should be queried to ascertain what they define as thorough.¹⁴⁵ At the provider level, a checklist of topics required for discussion during a visit might help providers be more thorough, as would having care plans. In addition, physicians could communicate to the patient in the beginning their objectives for the visit. If this were communicated, patients would be aware of what to expect from the visit. The potential benefits of these interventions are fewer medical errors because beneficiaries would understand what their physician had communicated to them and physicians would be aware of all the medications that their patients are taking and of their patient's concerns. Based on the race/ethnicity specific analyses, minority beneficiaries might benefit more greatly from programs that increase thoroughness, as compared to their white counterparts.

The number of patient-perception-of-physician variables that predicted physician communication could not be ignored. In addition to hurried and thorough care, confidence, lack of compassion, concern, and content knowledge also predicted physician communication. Health

outcomes can improve because of good patient-provider communication; therefore, interventions that improve perceptions and relationships between patients and providers will be helpful. To begin, physicians should become more cognizant of their own communication behaviors, by assessing whether they are empathetic, whether they are knowledgeable about the patient, and whether they show concern.¹⁴⁵ Such changes and cultural competency training can be helpful at improving relationships with patients of different cultural backgrounds.¹⁴⁶

The most encouragement from loved ones as possible is needed to improve PA because activated beneficiaries tend to be more independent decision makers and tend make better decisions.^{31, 32} Familial social support is important in the development of PA. In this study, spouses contributed to the development of activated patients and a lack of children hindered the development of activated patients. We must explore the types of support that are provided within marriages, and encourage spouses to engage in those forms of support as often as possible to promote activation. Once the types of support provided by spouses are identified, we can try to replicate those forms of support in unmarried beneficiaries through other mechanisms. Spousal support might be even more helpful in developing activation in the Hispanic populations. Where children are absent, communities might need to provide tangible, instrumental, emotional, appraisal, or informational support to help seniors become active participants in their care. This support can come from senior centers, churches, or even programs that pair seniors with younger adults not merely for companionship, but also to help encourage active participation. Persons providing social support can also be educated about the types of behaviors and actions they should encourage in their loved ones to improve activation.

Although not the focus of this dissertation, several immutable variables were associated with lower levels of PA. These included male gender, lower education, and lower income. Further exploration into why these different segments of the Medicare population have low PA is needed to implement effectively the interventions mentioned above.

Interventions that improve PA might affect Medicare Part D information seeking because better levels of PA were associated with more information seeking. In most cases, people with better, health-information-seeking skills were more likely to seek Medicare Part D information. Similarly, beneficiaries with better overall PA were more likely to seek. Unfortunately, this relationship was not observed in the Hispanic model; therefore, interventions might need to focus on other factors for this group. Improving activation in low-income beneficiaries might have a beneficial impact on Medicare Part D decision making. Improvements are needed because recent literature has shown that low income beneficiaries without previous prescription drug coverage did not enroll in Medicare Part D when it was first implemented.¹⁴⁷

In addition to studying whether patients sought information, I also assessed the number of sources of information they used because seniors complained of not being able to find information. Beneficiaries who were more activated used more information sources. This result shows more activated beneficiaries can cope with problems of finding useful information. In spite of their behavior, if beneficiaries are appropriately educated about the best sources, they should not need to use multiple information sources. Lastly, I found PA was not associated with nonpreferred channel use. In spite of this result, by educating beneficiaries about available information sources and creating better access to information sources that they prefer to use, their use of nonpreferred channels can be avoided.

In the Aim 3 of this dissertation, I studied racial/ethnic variation. Many of the relationships observed in the pooled models were not detected in the white, black, and Hispanic models. Therefore, if the pooled models were the only models predicted, one could easily be misled to think that the effects were the same across all groups; thus, opportunities for appropriate interventions could be lost. In the decomposition analyses, I found that many of the differences in PA and information-seeking behaviors were attributed to both differences in characteristics between the racial\ethnic groups (eg, education, income) and unexplained differences such as discrimination (perceived or real). Differences in self-care

self-efficacy were largely mediated through unexplained differences in both blacks and Hispanics, while differences in health information seeking were due to characteristic and effect differences. When the source of the difference is identified, we might be able to better target interventions. For instance, if the difference is unexplained and related to the visit encounter, interventions should focus on making all patients comfortable by improving cultural competency. With physician communication, the difference between whites and Hispanics was mainly due to characteristics differences. One example of a difference in characteristics could be literacy; thus, speaking in laymen's terms might improve physician communication in this group. With health information seeking, interventions that remove perceived discrimination or mistrust and interventions that make information easily accessible might be needed to improve health information seeking because both characteristic differences and effect differences contributed to the disparity between white and minority beneficiaries. Interventions addressing perceived and real discrimination must take place at the physician and institutional level.

Lastly, the model proposed for Medicare Part D information seeking might be applied to other information seeking situations. Few studies predict information seeking, let alone seeking related to insurance information. This model might be applied to other Medicare choice programs such as Medicare Advantage.

An Additional Focus on Improving Medicare Part D Decision Making

Although PA was the focus of this dissertation, other variables such as need for information were stronger predictors of Medicare Part D information seeking. The Wilson model says that people do not look for information unless they have a need.²⁷ Very few beneficiaries said that they needed information about Medicare Part D; yet, when I assessed their access to prescription drugs, the need for information was clear. Therefore, an additional focus of interventions to improve Medicare Part D information seeking and, ultimately, decision making is to make the topic more salient to beneficiaries. When beneficiaries understand why they should be informed and how to become informed, they might

be less likely to experience stress related to finding ways to meeting their prescription drug costs because they are more likely to make better coverage decisions. Interventions are gradually starting to focus on this topic. In the past, ads have reminded people that it was time to enroll or switch plans; however, they did not really focus on why beneficiaries should look for information and make new choices. As a result, many beneficiaries did nothing. In the 2010 open enrollment period, CMS sponsored a television ad that explained why beneficiaries should look for or seek Medicare Part D information despite already having coverage. This ad focused on the need to look at information every year and mentioned that savings could be realized if choices were re-evaluated.

If beneficiaries have increased activation and awareness of the need to look for information, there must be knowledgeable, reliable sources in place for beneficiaries to receive this information. Therefore, any program aimed at improving information seeking should also target information sources that beneficiaries prefer to use to ensure that accurate information is disseminated. This is particularly important for vulnerable beneficiaries because of their reliance on and preference for being informed by intermediaries (eg, health professionals, family and friends, advocates, senior groups). When intermediaries are ill informed, vulnerable beneficiaries are at an increased risk of knowledge deficits. Part of this education could include increasing awareness of all available information sources, so that preferred sources could direct beneficiaries to other information sources when they are not able to help them first hand. It is likely that, when trusted and preferred information sources make suggestions about alternative information sources, they lend their credibility to the alternative.

These information sources will be useful to beneficiaries if they provide personalized information.¹⁴⁸ From the inception of the Medicare Part D program, Medicare offered 2 tools that provided personalized information. These tools included the Medicare Web site PDP comparison tool and the 1-800 number. Unfortunately, the use of these tools was very low. One thought is that too much information and too many choices were provided, so beneficiaries were overwhelmed by the

number of options. A study comparing the type of information given to beneficiaries when making Medicare Part D decisions found that beneficiaries, when given simple, written, personalized information listing a single, low-cost, alternative plan, were more likely to switch to the low-cost alternative and ultimately save money over seniors who used the Medicare comparison tools during the 2007 open enrollment period.¹⁴⁸ This study was conducted in a university hospital; therefore, the question remains, “Who will provide simple, personalized information?”

In the most recent open enrollment period, the major pharmacy chains provided on their Web sites basic information about Medicare Part D and about their own PDP comparison tools. Unfortunately, like the Medicare tools, these calculators provided information on all available PDPs. The retail pharmacies also offered one-on-one counseling to help beneficiaries make decisions. At Walgreen’s drug store, beneficiaries could schedule a free review session.¹⁴⁹ At Rite-Aid, beneficiaries could meet with pharmacists to get a personalized report that listed 3 low-cost alternatives.¹⁵⁰ Rite-Aid also offered seniors discounts on their medications if they filled them on certain days of the week. The retail pharmacy might be an appropriate place for beneficiaries to receive simple information about plan options, especially if simple reports are provided like those at Rite-Aid.

Regardless of how motivated or activated beneficiaries are, some beneficiaries who do not have the skills to find a plan using the Internet will need more help than what is offered in retail pharmacies. Programs like Senior Pharmacist in Durham, NC, provide more comprehensive services to all Medicare beneficiaries.¹⁵¹ From a personal conversation with Gina Upchurch, RPh, MPH (April 2009), every patient receives a comprehensive drug review during which regimens are scrutinized for drug related problems and changes are recommended to physicians accordingly. Senior Pharmacist will actually help to make the PDP decision and enroll beneficiaries and not merely offer a choice. They also enroll beneficiaries into federal and local LIS programs and pharmaceutical-company-sponsored PAPs. When eligible, this organization also provides discounts to beneficiaries to help lower costs

during the “donut hole” if the beneficiary is not eligible for any other type of assistance. Senior Pharmassist differs from the chain pharmacies in that it provides help throughout the year, not merely during open enrollment. This service is particularly important for seniors who have trouble during the year when they fall into the “donut hole” and cannot afford their medications. More models like this nonprofit organization are needed because many seniors could benefit from the detailed help this organization provides, particularly vulnerable beneficiaries.

Low-income beneficiaries can also get help with Medicare Part D decisions from community health centers. Beneficiaries who receive care at these centers are eligible to fill prescriptions there also. In a personal conversation with Piedmont Community Health Center pharmacy manager, Carl Taylor RPh (September 2009), community health centers can help beneficiaries make PDP decisions and provide comprehensive drug reviews. The added benefit of these pharmacies is that they receive 340B drug pricing. This pricing is the lowest in the United States and is much lower than prices at retail pharmacies. Beneficiaries benefit from this low pricing especially when they reach the “donut hole” because the low prices are passed on to the patients. Beneficiaries, who are currently not being seen in community health centers, must be willing to switch physicians to receive the beneficial drug prices. He added that these programs are sustainable because revenue is generated when filling Medicare beneficiaries’ prescriptions. These centers are allowed to retain the difference in the contract PDP price for medications and the cost of dispensing. Community health centers are found all across the United States; however, not all centers have promoted their services to seniors. Doing so can benefit the centers and Medicare beneficiaries.

Limitations

This study has several limitations. First, the Medicare PA instrument did not have the best psychometric properties, the Cronbach’s alpha of the assertiveness domain was less than 0.6. This

problem might have played into CMS's decision not to use a domain-based approach to study PA with this Medicare instrument. CMS uses this instrument to segment beneficiaries into clusters. All of the publications and presentations on this instrument have focused on segmenting beneficiaries into 4 clusters: active, complacent, high effort, and passive to segment the Medicare population.³² Heller recently suggested using the longer instrument (22-item) to improve instrument properties.¹⁴³ Second, the levels of PA measured in 2004 MCBS might not be representative of PA today. Some data suggests that more beneficiaries bring a list of their medications to their office visit; therefore, health information scores might be better today.¹⁴³ Third, some associations might not have been observed between PA and outcomes because PA measured by the Medicare PA instrument is not specific to the outcomes studied. The Medicare PA instrument measures PA as a global construct.

Fourth, in the race-stratified analyses, the samples became very small, requiring some variables to be dropped from the analyses because there were too few observations for estimation. A lack of power might have contributed to the null results that were observed in the nonpreferred channel use models, that is, the lack of power might not have been merely due to a lack of association. Therefore, a larger sample size in future studies should provide more clarity. Fifth, the results that were found might not be generalizable to beneficiaries of other races because the race-stratified analyses were limited to white, black, and Hispanic beneficiaries.

Strengths

Despite the limitations of this study, it has several strengths that make important contributions to our knowledge about PA and racial/ethnic variation. First, this study was one of the first to study predictors of PA in a Medicare population. Second, it was the first to assess predictors and outcomes of PA in Hispanics beneficiaries. Third, it identified predictors of Medicare Part D information seeking, instead of only reporting the percent of beneficiaries that sought information. Fourth, because PA was measured prior to when beneficiaries started their seeking process, I am confident in the direction of

the relationship between PA and Medicare Part D information seeking. Fifth, the stratified analyses helped to detect variations in effects across racial groups that are often not studied when researchers explore health disparities.

Direction of Future Research

The suggestions of future research are based on the implications and the limitations of this current research. First, an overall PA score was created; therefore, it must be compared to other PA measures, for example, the PAM. Future studies should examine the overall PA score's ability to predict health outcomes and behaviors. Hibbard's PAM should also be included in these studies to determine which instrument is a stronger predictor. The overall PA score predicted Medicare Part D information seeking and the PAM did not; therefore, it is possible that the Medicare overall PA score is more sensitive.

Second, many different people affect PA; therefore, future studies should examine how beneficiaries are supported by those people. Focus groups could be conducted with physicians, spouses, children, and beneficiaries to examine how the support they provide relates to being activated. In addition, these focus groups might help our in our understanding of why certain groups do not feel support from the same types of people.

Third, sociodemographic variables were strong predictors of all the PA domains. Therefore, future studies should investigate differences of effect by income or LIS status. Gender-based, stratified analyses might also be appropriate because males consistently had lower PA scores and were less likely to look for information. By studying these additional stratification options, we can determine whether group-specific interventions are needed in these groups.

Fourth, information seeking is merely Step 1 in the information behavior process. Future studies should focus on predicting outcomes further along the information behavior cycle, such as processing and use of information. Through these studies, we can learn about what effects information

seeking, the number of sources used, and the use of nonpreferred channels have on Medicare Part D knowledge and decision making. If the cyclical nature of the information behavior model is tested, we could determine how the initial Medicare Part D information seeking process affects seeking in subsequent years. Ultimately, these relationships can inform stakeholders of how well the information dissemination process is working.

Conclusion

A lack of knowledge, motivation, skill, and opportunity all prevent beneficiaries from being activated and from participating in behaviors that result in the best health outcomes and decisions. This relationship could not be truer than when one looks at the behaviors of seniors who made PDP decisions for 2010. Beneficiaries were still reluctant to make decisions about plan switching.¹⁵² This study shows that PA might be lacking because of social environmental variables such as perceptions of physicians and familial support. The results also show that activated beneficiaries are more likely to be Medicare Part D information seekers; however, understanding the need for information might be equally as important. Where racial/ethnic differences were observed, the results show that differences in characteristics and differences in effects both contribute to disparities, so that, when developing interventions, these issues must be addressed. This study's results, along with some of the recommendations for future research, will be helpful in developing the interventions that will be needed to improve activation and to improve the Medicare Part D decision-making process. Targeting beneficiaries' social environment, knowledge, motivation, skill, and opportunity could all increase and ultimately lead to better Medicare Part D decision making.

APPENDIX A: CONCEPTUAL MODELS USED TO CREATE THE CONCEPTUAL FRAMEWORK

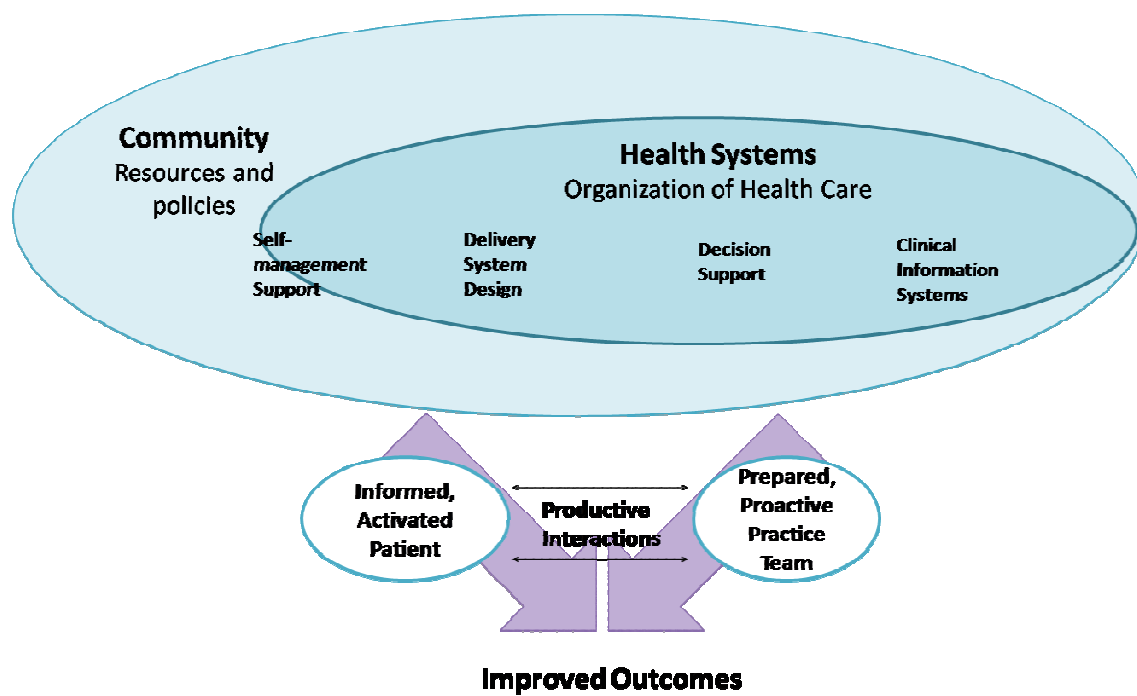


Figure 6. Chronic Care Model.

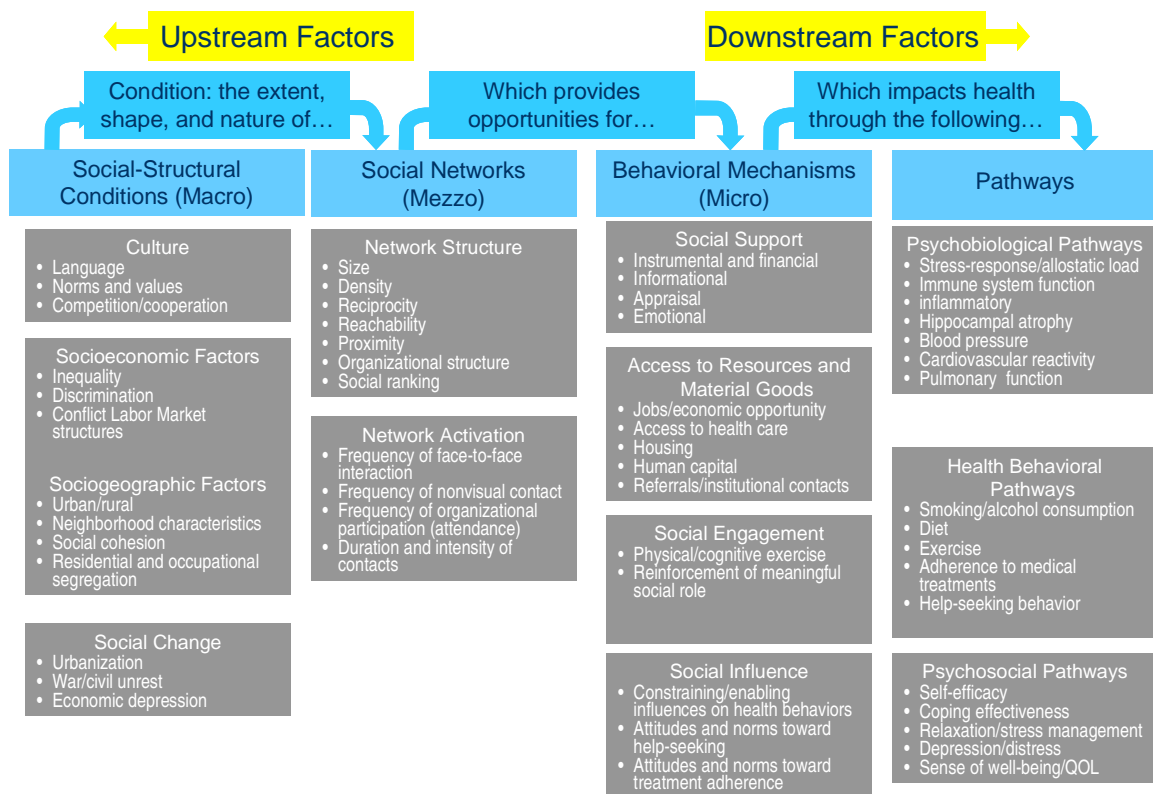


Figure 7. Conceptual model of how social networks affect health

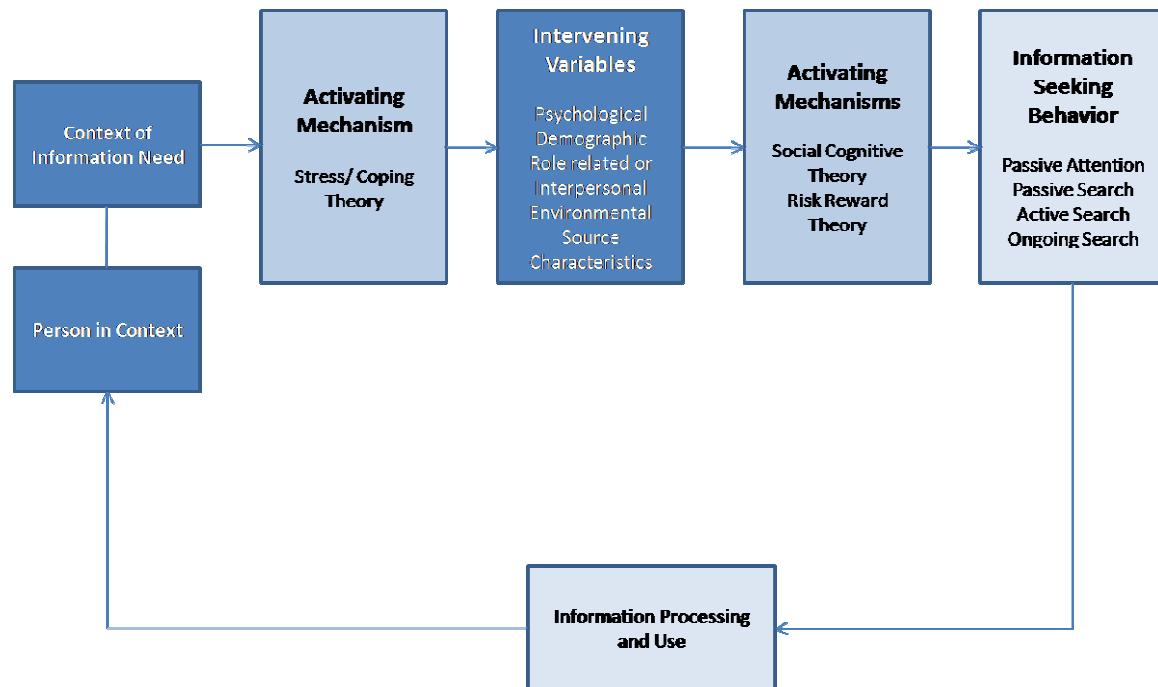


Figure 8. Wilson Model of Information Behavior.

APPENDIX B: MULTICOLLINEARITY DIAGNOSTICS

Table 43. Aim 1: Multicollinearity Diagnostics

	SQRT VIF	VIF	Tolerance	R-squared
Social environment				
Thorough	1.49	1.22	0.672	0.328
Competent	1.3	1.14	0.770	0.230
Confident	1.67	1.29	0.600	0.400
Lacks compassion	1.21	1.1	0.830	0.170
Hurried care	1.18	1.08	0.851	0.149
Content knowledge	1.51	1.23	0.660	0.340
Concerned	1.28	1.13	0.783	0.217
Married	2.4	1.55	0.417	0.583
Lives alone	2.11	1.45	0.473	0.527
<i>Number of living children</i>				
No children alive	1.24	1.11	0.809	0.191
One kid living	1.11	1.05	0.901	0.099
Two children living	1.13	1.06	0.887	0.113
Takes helper to the doctor	1.21	1.1	0.828	0.172
Lives in community housing	1.06	1.03	0.943	0.057
MSA	1.13	1.06	0.885	0.115
Sociodemographics				
<i>Race/Ethnicity</i>				
Black	1.16	1.08	0.865	0.135
Hispanic	1.14	1.07	0.880	0.120
Other	1.04	1.02	0.965	0.035
Age in years	2.39	1.55	0.419	0.581
Male	1.65	1.28	0.606	0.394
Employed	1.09	1.04	0.920	0.080
High school graduate	1.48	1.21	0.678	0.322
Income < \$25	1.52	1.23	0.659	0.342
Physical and cognitive functioning				
<i>Health status (ref. fair/poor)</i>				

Table 43. Aim 1: Multicollinearity Diagnostics

	SQRT VIF	VIF	Tolerance	R-squared
Excellent/very good	2.82	1.68	0.355	0.645
Good	2.02	1.42	0.494	0.506
<i>Health status compared to last year (ref. worse)</i>				
Better	1.57	1.25	0.638	0.362
Same	1.77	1.33	0.565	0.436
Mean number of disease	8.65	2.94	0.116	0.884
Problems seeing	1.12	1.06	0.894	0.106
Problems hearing	1.15	1.07	0.873	0.127
No ADL	1.43	1.2	0.697	0.303
No IADL	1.48	1.22	0.675	0.325
Poor cognitive function	1.61	1.27	0.621	0.379
Problems concentrating	1.31	1.15	0.762	0.239
Adequate literacy	2.16	1.47	0.464	0.537
<i>Access to care</i>				
Trouble getting care	1.18	1.09	0.847	0.153
Delayed getting care	1.25	1.12	0.799	0.201
<i>Supplemental insurance (ref. public/FFS)</i>				
Medicaid	2.15	1.47	0.466	0.534
HMO	1.8	1.34	0.557	0.444
ESI	2.69	1.64	0.372	0.628
Tricare/Medigap	2.2	1.48	0.454	0.546
Mean VIF	1.69			

ADL = activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service; HMO = health maintenance organization; IADL = instrumental activities of daily life; MSA = metropolitan statistical area; ref. = reference group; SE = standard error; SQRT = square root; VIF = variance inflation factor

Table 44. Aim 2: Multicollinearity Diagnostics

Variable	SQRT VIF	VIF	Tolerance	R-squared
<i>PA domains</i>				
SCSE	1.45	1.20	0.690	0.310
PC	1.29	1.14	0.773	0.227
HIS	1.32	1.15	0.760	0.240

Table 44. Aim 2: Multicollinearity Diagnostics

Variable	SQRT VIF	VIF	Tolerance	R-squared
Assertiveness	1.18	1.09	0.847	0.153
Sociodemographics				
<i>Race/ethnicity (ref. white)</i>				
Black	1.14	1.07	0.877	0.123
Hispanic	1.19	1.09	0.841	0.159
Other	1.04	1.02	0.962	0.038
Age in years	2.07	1.44	0.484	0.516
Male	1.20	1.10	0.830	0.170
Employed	1.09	1.05	0.915	0.086
High school graduate	1.57	1.25	0.638	0.362
Income < \$25	1.58	1.26	0.632	0.368
Married	1.37	1.17	0.727	0.273
MSA	1.15	1.07	0.872	0.128
Physical and cognitive functioning				
<i>Health status (ref. fair/poor)</i>				
Excellent/very good	2.79	1.67	0.358	0.642
Good	2.00	1.41	0.501	0.499
<i>Health status compared to last year (ref. worse)</i>				
Better	1.64	1.28	0.611	0.389
Same	1.79	1.34	0.558	0.442
Mean number of disease	1.34	1.16	0.749	0.251
Problems seeing	1.36	1.17	0.737	0.263
Problems hearing	1.31	1.14	0.765	0.235
Seeing causes problems learning about Medicare	1.38	1.17	0.725	0.275
Hearing causes problems learning about Medicare	1.25	1.12	0.803	0.197
No ADL	1.45	1.20	0.690	0.310
No IADL	1.50	1.22	0.668	0.332
Poor cognitive function	1.46	1.21	0.684	0.317
Problems concentrating	1.30	1.14	0.767	0.233
Makes own insurance decisions	1.13	1.06	0.888	0.113
Access to information				

Table 44. Aim 2: Multicollinearity Diagnostics

Variable	SQRT VIF	VIF	Tolerance	R-squared
Has Internet access	1.28	1.13	0.779	0.221
Adequate literacy	2.16	1.47	0.463	0.537
Need				
Needed information about Medicare Part D	1.04	1.02	0.960	0.040
Access to care				
Had trouble or delayed getting care	1.20	1.10	0.832	0.169
Supplemental insurance				
Medicaid	2.67	1.63	0.375	0.625
HMO	2.27	1.51	0.440	0.560
ESI	3.84	1.96	0.261	0.740
Tricare/Medigap	2.66	1.63	0.376	0.624
Access to prescription drugs				
Rx coverage 2005	1.62	1.27	0.618	0.382
Rx discount card	1.18	1.09	0.846	0.154
Did not fill need medication	1.08	1.04	0.930	0.070
Uses mail order pharmacy	1.28	1.13	0.781	0.219
Gets medications from outside of the United States	1.40	1.18	0.716	0.284
Asks for generic medications	1.20	1.10	0.831	0.169
Uses samples	1.22	1.10	0.820	0.180
Takes a smaller dose than prescribed	2.87	1.69	0.349	0.652
Compares drug prices	1.38	1.17	0.725	0.275
Skips doses	2.89	1.70	0.346	0.654
Prior knowledge				
Medicare discount cards	1.31	1.14	0.765	0.235
Medicare Part D	1.35	1.16	0.743	0.257
Mean VIF	1.68			

ADL = activities of daily living; ESI = employer sponsored insurance; FFS = fee-for-service; HIS = health information seeking; HMO = health maintenance organization; IADL = instrumental activities of daily living; MSA = metropolitan statistical area; PC = physician communication; ref. = reference group; SCSE = self-care self-efficacy; SQRT = square root; VIF = variance inflation factor

APPENDIX C: DISTRIBUTION ASSESSMENT AND DIAGNOSTICS

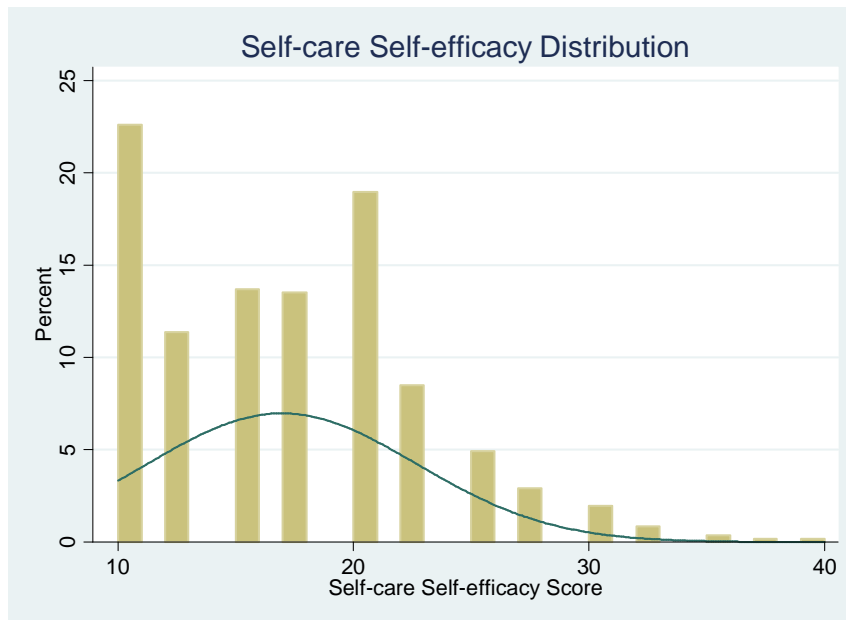


Figure 9. Distribution of the Self-care Self-efficacy PA domain.

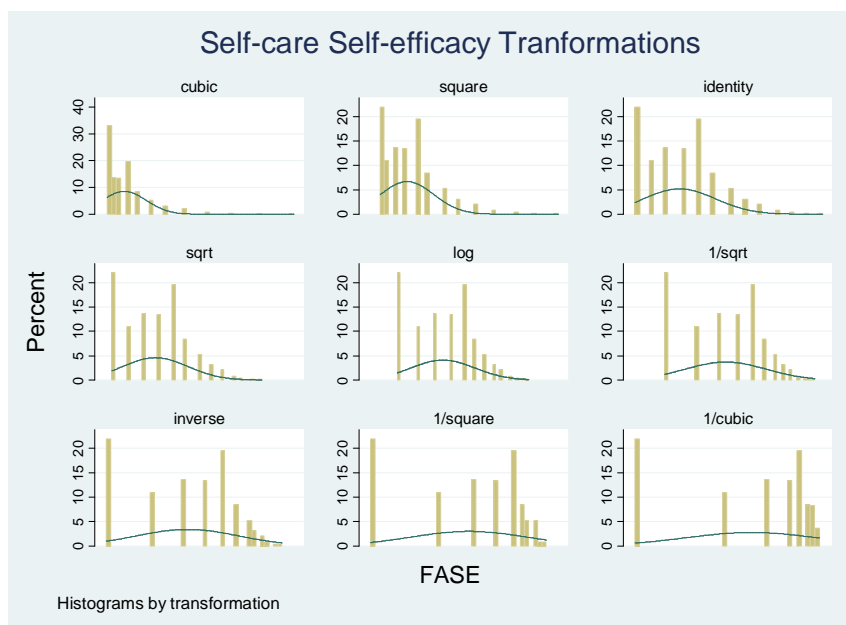


Figure 10. Self-care Self-efficacy transformations.

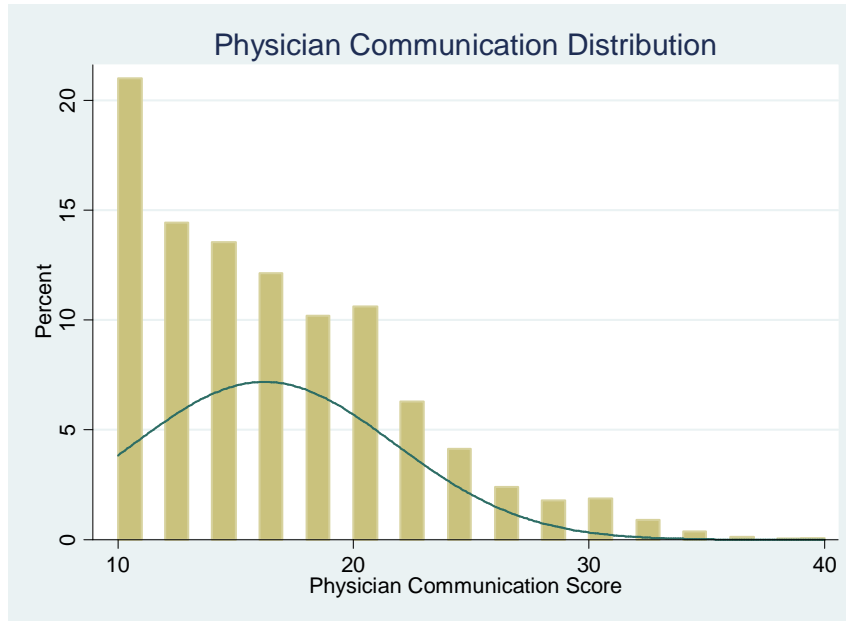


Figure 11. Distribution of physician-communication PA domain.

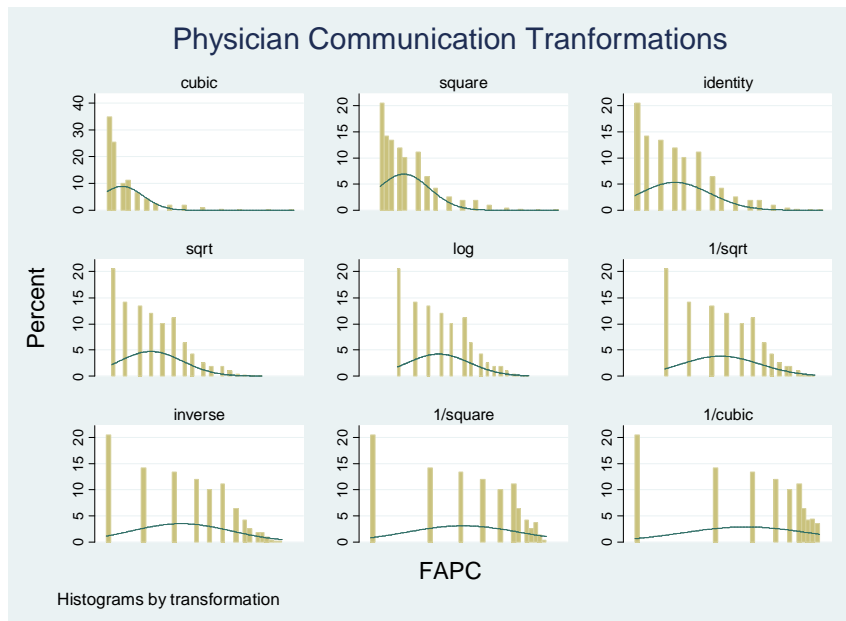


Figure 12. Physician-communication transformations.

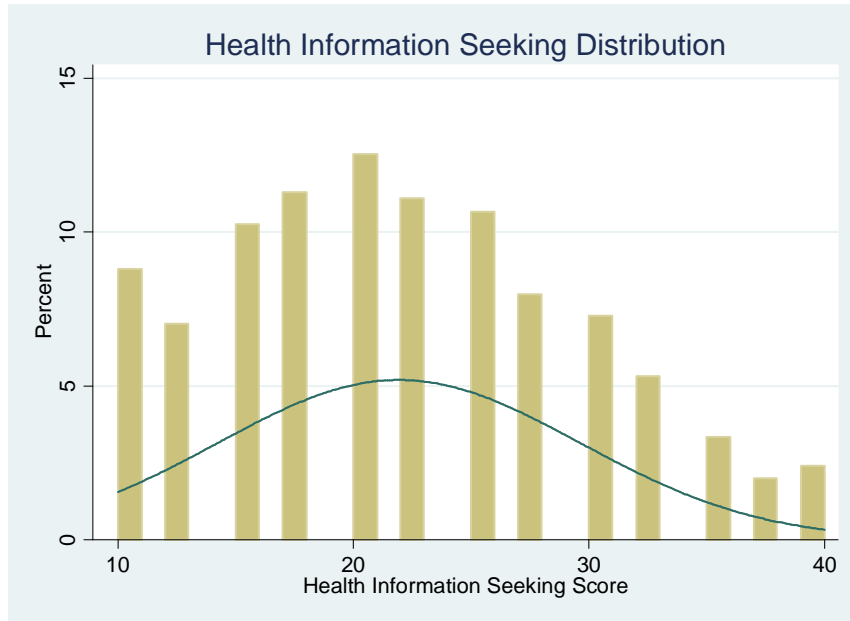


Figure 13. Distribution of health-information-seeking domain.

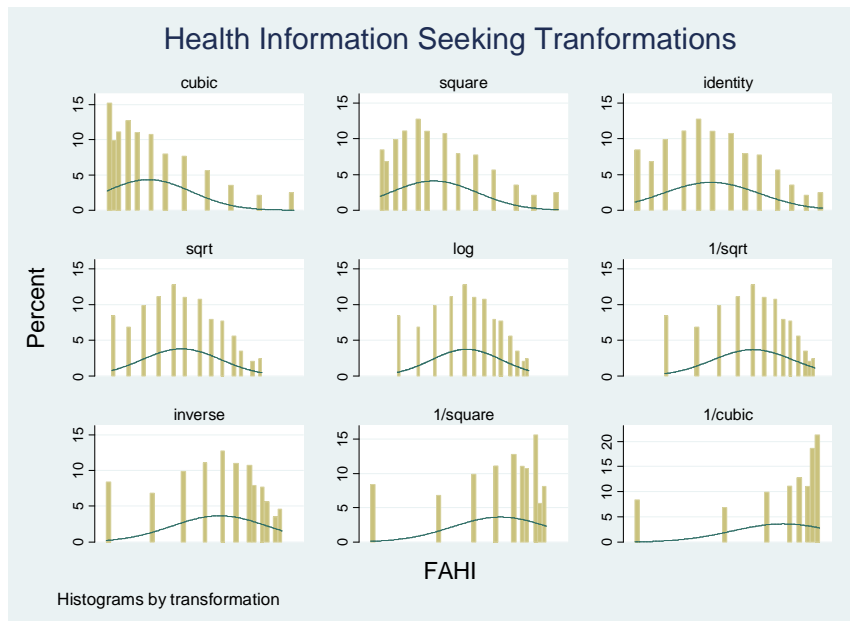


Figure 14. Health-information-seeking transformations.

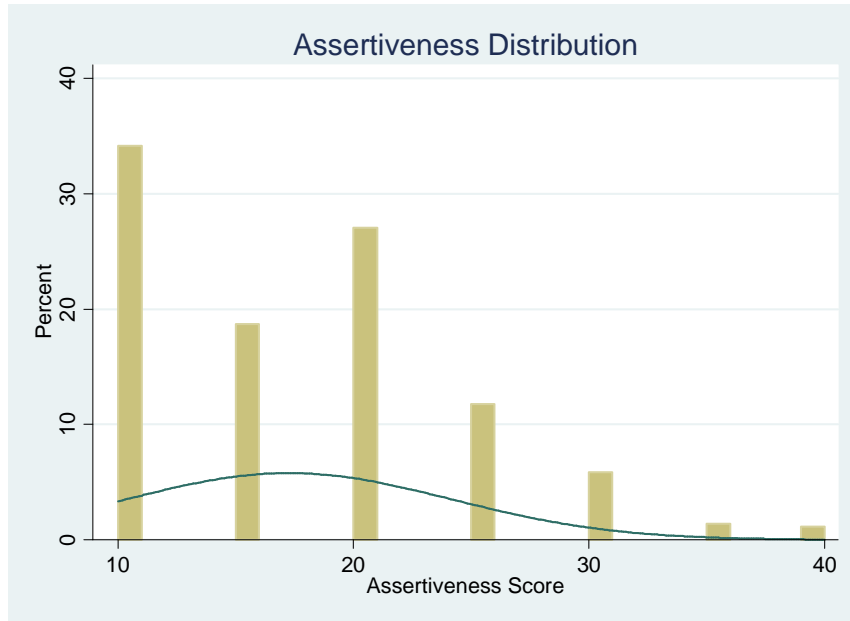


Figure 15. Distribution of assertiveness domain.

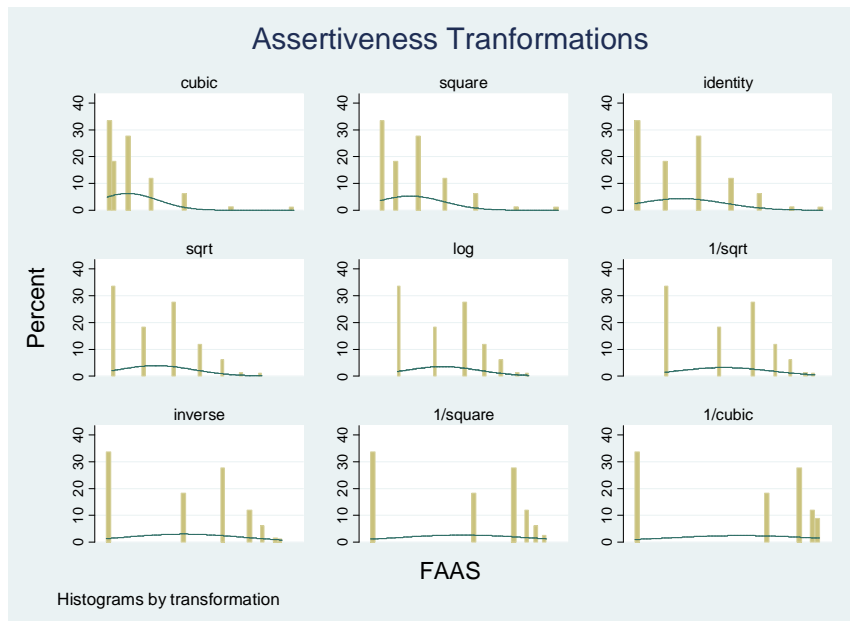


Figure 16. Assertiveness transformation.

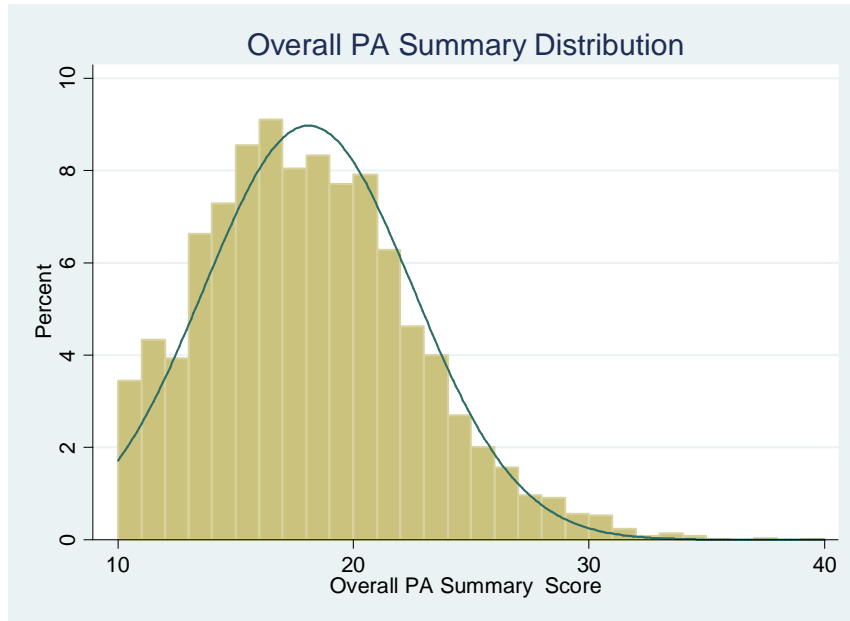


Figure 17. Distribution of overall PA summary scores.

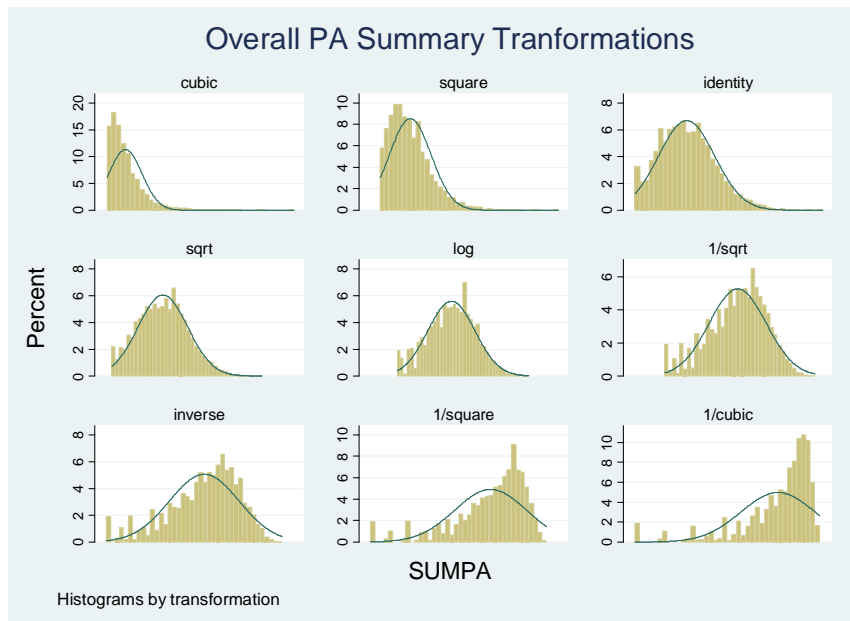


Figure 18. Overall PA summary score transformations.

APPENDIX D: CORRELATION MATRICES

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Thorough	Competent	Confidence	Lacks Compassion	Hurried Care	Content Knowledge	Concern	Married
Thorough	1							
Competent	0.3310*	1						
Confidence	0.4896*	0.3836*	1					
Lacks compassion	-0.2649*	-0.2148*	-0.3109*	1				
Hurried care	-0.2830*	-0.1368*	-0.2924*	0.2608*	1			
Content knowledge	0.4024*	0.4014*	0.4814*	-0.2843*	-0.2183*	1		
Concern	0.3294*	0.2055*	0.3598*	-0.1990*	-0.1945*	0.3312*	1	
Married	0.0255*	0.0315*	0.0115	-0.0241*	0.0088	0.0162	0.0289*	1
Lives alone	-0.0285*	-0.0315*	-0.0147	0.0099	0.0011	-0.0032	-0.012	-0.6909*
No children	0.0097	0.005	-0.0144	0.0194	0.0071	-0.0153	-0.0188	-0.2282*
One living child	-0.0256*	-0.0193	-0.0025	0.0103	0.007	-0.0143	-0.0004	-0.0550*
Two living children	-0.0168	-0.0113	-0.0122	0.0017	0.0075	-0.0013	-0.0165	0.0274*
Takes a helper to the doctor	0.0059	0.0047	0.0038	0.0250*	-0.0223*	0.0187	-0.0022	0.0969*
Lives in community housing	-0.0084	-0.0062	-0.017	-0.0133	0.001	0.0066	-0.0009	-0.0799*
MSA	0.0266*	0.0355*	0.0039	-0.0255*	-0.0126	0.0194	0.0217*	-0.0164
Age	0.0202	0.0376*	0.0572*	-0.0797*	-0.0480*	0.0896*	0.0916*	0.0015
Male	0.0123	-0.0035	-0.0062	0.0084	0.016	0.0013	0.0131	0.2624*
Employed	0.0163	0.0168	0.0004	-0.0256*	0.0041	0.0067	0.0185	0.0466*
High school graduate	0.0004	0.0137	-0.0001	-0.0584*	0.0067	0.0031	0.0208*	0.1137*

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Thorough	Competent	Confidence	Lacks Compassion	Hurried Care	Content Knowledge	Concern	Married
Income < \$25K	−0.0201	−0.0310*	−0.0221*	0.0617*	0.0016	−0.0310*	−0.0426*	−0.4037*
Every good	0.0466*	0.0380*	0.0519*	−0.0534*	−0.0400*	0.0465*	0.0800*	0.0807*
Good	−0.0088	−0.0033	−0.0019	−0.01	0.0026	0.0095	0.0129	−0.0012
Better	0.017	0.0035	−0.0046	0.0001	0.0056	0.0018	0.0005	−0.0144
Same	0.0392*	0.0344*	0.0491*	−0.0415*	−0.0437*	0.0444*	0.0711*	0.0436*
Number of comorbidities	−0.0248*	−0.0094	−0.0201	0.0052	0.0257*	0.0049	−0.0179	−0.0316*
Difficulty seeing	−0.0576*	−0.0362*	−0.0365*	0.0389*	0.0594*	−0.0388*	−0.0614*	−0.0522*
Difficulty hearing	−0.0455*	0.0005	−0.0333*	0.0192	0.0518*	−0.0046	−0.0420*	0.0172
ADLs	−0.0554*	−0.0337*	−0.0506*	0.0424*	0.0372*	−0.0305*	−0.0741*	−0.0763*
IADLs	−0.0654*	−0.0296*	−0.0549*	0.0589*	0.0542*	−0.0449*	−0.0837*	−0.0956*
Poor cognitive function	−0.0463*	−0.0322*	−0.0611*	0.0701*	0.0643*	−0.0704*	−0.0919*	−0.1165*
Problems concentrating	−0.0566*	−0.0194	−0.0395*	0.0872*	0.0653*	−0.0611*	−0.0804*	−0.0744*
Adequate literacy	0.0280*	0.0141	0.0183	−0.0334*	0.002	−0.0024	0.0353*	0.1716*
Trouble getting care	−0.0908*	−0.0759*	−0.1050*	0.0929*	0.0667*	−0.1115*	−0.1923*	−0.0312*
Delayed getting care	−0.0661*	−0.0371*	−0.0687*	0.0761*	0.0567*	−0.0815*	−0.1529*	−0.0359*
Medicaid	−0.0077	−0.0559*	−0.0362*	0.0861*	0.014	−0.0486*	−0.0492*	−0.2656*
HMO	−0.0347*	−0.0011	−0.0355*	0.0059	0.0271*	−0.0082	−0.0147	0.0358*
ESI	0.0409*	0.0376*	0.0386*	−0.0622*	−0.0250*	0.0444*	0.0464*	0.1616*
Tricare/Medigap	−0.0132	0.0203	0.0260*	−0.0378*	−0.008	0.0224*	0.0305*	0.0255*

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Lives Alone	No Children	One Living Child	Two Living Children	Takes a Helper to The Doctor	Lives in Community Housing	MSA	Age
Lives alone	1							
No children	0.1647*	1						
One living child	0.0617*	-0.1274*	1					
Two living children	-0.0075	-0.2013*	-0.2108*	1				
Takes a helper to the doctor	-0.1598*	-0.0083	0.0114	-0.0265*	1			
Lives in community housing	0.1489*	0.0329*	-0.0064	0.0221*	0.0246*	1		
MSA	0.0104	0.0328*	0.0019	0.0263*	-0.0490*	0.0856*	1	
Age	0.1506*	-0.2064*	-0.0237*	0.0433*	0.0574*	0.1223*	0.0664*	1
Male	-0.2008*	0.0102	-0.0358*	-0.0084	-0.0507*	-0.0415*	-0.0085	-0.0869*
Employed	-0.0387*	0.016	-0.0522*	-0.0066	-0.1303*	-0.0447*	0.0189	-0.1106*
High school graduate	-0.0436*	0.0142	0.003	0.0541*	-0.1582*	0.0017	0.1051*	-0.0419*
Income < \$25K	0.2379*	0.0984*	0.0598*	-0.0526*	0.1082*	0.0310*	-0.0886*	-0.0846*
Every good	0.0031	-0.0401*	-0.0424*	0.0131	-0.1250*	0.0109	0.0510*	0.1923*
Good	-0.0029	-0.0101	-0.0094	0.0173	-0.0077	0.0029	-0.0002	0.0580*
Better	-0.0092	-0.0023	0.0031	-0.0155	0.0259*	0.0049	0.0084	-0.0489*
Same	-0.0055	-0.004	-0.0315*	0.0137	-0.1229*	-0.0186	0.0057	0.1098*
Number of comorbidities	0.0306*	-0.0625*	0.0225*	-0.009	0.1041*	0.0560*	-0.0330*	0.0959*
Difficulty seeing	0.0241*	0.0255*	0.0143	-0.0065	0.1070*	0.0052	0.0153	-0.0212*
Difficulty hearing	0.0009	-0.0137	-0.0227*	-0.0067	0.0686*	0.0298*	0.0142	0.1445*
ADLs	0.0317*	0.014	0.0451*	-0.006	0.2048*	0.0425*	0.0163	-0.009

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Lives Alone	No Children	One Living Child	Two Living Children	Takes a Helper to The Doctor	Lives in Community Housing	MSA	Age
IADLs	0.0277*	0.0286*	0.0356*	-0.0125	0.2343*	0.0629*	0.0145	-0.0181
Poor cognitive function	0.0364*	0.0856*	0.0250*	-0.0210*	0.0770*	0.0221*	-0.0194	-0.3084*
Problems concentrating	0.0062	0.0816*	0.0058	-0.0294*	0.0849*	0.0085	-0.0119	-0.2192*
Adequate literacy	-0.1368*	0.0143	-0.0502*	0.0144	-0.2352*	-0.0622*	0.0396*	-0.3379*
Trouble getting care	-0.0088	0.0356*	0.0198	-0.0037	0.0235*	-0.0015	-0.0111	-0.2080*
Delayed getting care	-0.014	0.0213*	0.0243*	-0.0265*	0.0407*	-0.0232*	-0.0536*	-0.2428*
Medicaid	0.0924*	0.1521*	0.0428*	-0.0688*	0.0976*	0.0222*	-0.0474*	-0.3806*
HMO	-0.0173	-0.0374*	-0.0156	0.0240*	-0.0269*	0.0353*	0.2204*	0.1102*
ESI	-0.0718*	-0.0607*	-0.0061	0.0256*	-0.0556*	-0.0224*	0.0217*	0.1180*
Tricare/Medigap	0.0382*	-0.0537*	-0.0196	0.0298*	-0.0251*	0.0142	-0.0741*	0.1991*

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Male	Employed	High School Graduate	Income <\$25K	Every Good	Good	Better	Same
Male	1							
Employed	0.0986*	1						
High school graduate	0.009	0.0787*	1					
Income < \$25K	-0.1616*	-0.1264*	-0.2895*	1				
Every good	0.0157	0.1102*	0.1258*	-0.1884*	1			
Good	0.001	-0.0076	0.014	0.0075	-0.5811*	1		
Better	-0.0135	0.0123	-0.0186	0.0303*	0.0401*	0.0003	1	

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Male	Employed	High School Graduate	Income <\$25K	Every Good	Good	Better	Same
Same	0.0392*	0.0594*	0.0726*	-0.1051*	0.2040*	0.0542*	-0.5443*	1
Number of comorbidities	0.0251*	-0.1141*	-0.0513*	0.0561*	-0.2423*	0.0155	0.0507*	-0.1958*
Difficulty seeing	-0.0322*	-0.0469*	-0.0429*	0.0763*	-0.1182*	-0.0221*	-0.0034	-0.1249*
Difficulty hearing	0.1195*	-0.0138	-0.0014	-0.0397*	-0.0097	-0.0037	-0.0102	-0.0476*
ADLs	-0.0727*	-0.1295*	-0.0820*	0.1104*	-0.2475*	-0.0351*	-0.0068	-0.2163*
IADLs	-0.0929*	-0.1412*	-0.0966*	0.1369*	-0.2733*	-0.009	0.0301*	-0.2376*
Poor cognitive function	-0.0460*	-0.0417*	-0.0556*	0.1353*	-0.1906*	-0.0305*	0.0267*	-0.1572*
Problems concentrating	-0.0218*	-0.0442*	-0.0550*	0.1086*	-0.1472*	-0.0308*	0.0084	-0.1444*
Adequate literacy	0.0761*	0.1735*	0.5030*	-0.2817*	0.3151*	-0.0429*	0.0429*	0.1196*
Trouble getting care	-0.0037	-0.0197	-0.0246*	0.0708*	-0.1059*	-0.0293*	0.0057	-0.1091*
Delayed getting care	-0.0133	-0.0057	-0.0433*	0.1128*	-0.1272*	-0.0532*	-0.0049	-0.1273*
Medicaid	-0.0548*	-0.0766*	-0.2356*	0.3630*	-0.2055*	-0.0371*	0.0610*	-0.1339*
HMO	-0.0094	0.0016	0.0318*	-0.0359*	0.0467*	0.0163	-0.0191	0.0346*
ESI	0.0327*	0.0503*	0.1524*	-0.2875*	0.0925*	0.0119	-0.0308*	0.0579*
Tricare/Medigap	-0.0457*	0.0082	0.0564*	-0.0377*	0.0876*	0.0118	0.001	0.0445*

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Number of Comorbidities	Difficulty Seeing	Difficulty Hearing	ADLS	IADLS	Poor Cognitive Function	Problems Concentrating	Adequate Literacy
Number of comorbidities	1							
Difficulty seeing	0.1248*	1						

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Number of Comorbidities	Difficulty Seeing	Difficulty Hearing	ADLS	IADLS	Poor Cognitive Function	Problems Concentrating	Adequate Literacy
Difficulty hearing	0.1243*	0.1882*	1					
ADLS	0.2576*	0.1720*	0.1305*	1				
IADLS	0.2633*	0.1836*	0.1380*	0.4729*	1			
Poor cognitive function	0.2532*	0.1341*	0.0565*	0.1934*	0.2222*	1		
Problems concentrating	0.1252*	0.1654*	0.0917*	0.1892*	0.2031*	0.4240*	1	
Adequate literacy	-0.1664*	-0.0760*	-0.0892*	-0.2059*	-0.2244*	-0.0323*	-0.0656*	1
Trouble getting care	0.0166	0.0661*	0.0134	0.1074*	0.1027*	0.1288*	0.1528*	-0.0095
Delayed getting care	0.0886*	0.1323*	0.0651*	0.1628*	0.1502*	0.2004*	0.2061*	-0.0095
Medicaid	0.0473*	0.0699*	-0.0514*	0.1176*	0.1477*	0.2224*	0.1590*	-0.1137*
HMO	-0.0393*	-0.0075	0.0033	-0.0305*	-0.0452*	-0.0544*	-0.0420*	0.0064
ESI	0.0006	-0.0352*	0.0292*	-0.0648*	-0.0697*	-0.0918*	-0.0698*	0.1225*
Tricare/Medigap	0.0068	-0.0185	0.0239*	-0.0272*	-0.0335*	-0.0853*	-0.0675*	-0.0291*

Table 45. Correlation Matrix of Patient Variables Used in Aim 1

	Trouble Getting Care	Delayed Getting Care	Medicaid	HMO	ESI	Tricare/Medigap
Trouble getting care	1					
Delayed getting care	0.3096*	1				
Medicaid	0.1099*	0.0876*	1			
HMO	-0.0065	-0.0474*	-0.1884*	1		

ESI	−0.0759*	−0.0856*	−0.3288*	−0.2915*	1	
Tricare/Medigap	−0.0682*	−0.0791*	−0.2212*	−0.1414*	−0.4220*	1

ADL = activities of daily life; ESI = employer-sponsored insurance; HMO = health maintenance organization; IADL = Interactive activities of daily life; MSA = metropolitan statistical area

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Self-care Self-efficacy	Physician Communication	Health Information Seeking	Assertiveness	Overall PA	Age	Male	Employed
Self-care self-efficacy	1							
Physician communication	0.4096*	1						
Health information seeking	0.3167*	0.2914*	1					
Assertiveness	0.3332*	0.2319*	0.2188*	1				
Overall PA	0.7157*	0.6617*	0.7098*	0.6609*	1			
Age	0.0072	−0.0228	−0.0815*	0.0786*	−0.0097	1		
Male	0.0351*	0.0433*	0.1278*	−0.0139	0.0747*	−0.0817*	1	
Employed	−0.0267*	−0.0248*	0.0173	−0.0437*	−0.0258*	−0.1215*	0.1070*	1
High school grad	−0.1541*	−0.0960*	−0.2226*	−0.1063*	−0.2169*	−0.0378*	0.0125	0.0912*
Income < \$25k	0.1320*	0.0884*	0.1598*	0.0974*	0.1768*	−0.0738*	−0.1786*	−0.1354*
Married	−0.0815*	−0.0547*	−0.1079*	−0.0791*	−0.1206*	0.004	0.2693*	0.0637*
MSA	0.0405*	0.0209	−0.0019	−0.0069	0.0161	0.0815*	0.0003	0.0172
Number of diseases	0.0530*	0.017	−0.0814*	0.0098	−0.009	0.0631*	−0.0543*	−0.1103*
Difficulty seeing	0.1069*	0.0610*	0.0388*	0.0356*	0.0841*	−0.0128	−0.0393*	−0.0493*
Difficulty hearing	0.1214*	0.0506*	0.0352*	0.0543*	0.0911*	0.1335*	0.1241*	0.0043
Sight affects learning about Medicare	0.1249*	0.1095*	0.0851*	0.0476*	0.1297*	−0.0231	−0.0152	−0.0638*
Hearing affects learning about Medicare	0.1172*	0.1164*	0.0752*	0.0466*	0.1248*	0.0500*	0.0393*	−0.0364*
ADL	0.1144*	0.0525*	0.0584*	0.0409*	0.0943*	0.0062	−0.0553*	−0.1370*

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Self-care Self-efficacy	Physician Communication	Health Information Seeking	Assertiveness	Overall PA	Age	Male	Employed
IADL	0.1356*	0.0510*	0.0512*	0.0440*	0.0988*	-0.0076	-0.1037*	-0.1352*
Cognitive function	0.1288*	0.0836*	0.0798*	0.0056	0.1043*	-0.2847*	-0.0665*	-0.0430*
Concentration	0.1526*	0.1036*	0.0907*	0.0284*	0.1317*	-0.1860*	-0.0382*	-0.0551*
Makes own insurance decision	-0.1679*	-0.0753*	-0.1308*	-0.1009*	-0.1731*	-0.0385*	0.0565*	0.0420*
Internet access	-0.1504*	-0.1016*	-0.1503*	-0.1154*	-0.1897*	-0.1648*	0.0895*	0.1269*
Literacy	-0.1744*	-0.1050*	-0.1348*	-0.1450*	-0.2033*	-0.3551*	0.0886*	0.1886*
Need for Part D information	0.0337*	-0.0025	0.0133	0.0186	0.023	-0.0203	-0.0116	0.0349*
Trouble or delaying care	0.0673*	0.0666*	0.0302*	-0.0046	0.0539*	-0.2201*	-0.0325*	0.0013
Medicaid	0.1546*	0.1032*	0.1760*	0.0630*	0.1825*	-0.3574*	-0.0671*	-0.0777*
HMO	0.0022	0.0109	-0.0051	-0.0065	-0.0006	0.0960*	0.0005	0.0066
ESI	-0.0780*	-0.0810*	-0.1194*	-0.0430*	-0.1187*	0.1047*	0.0332*	0.0409*
Tricare/Medigap	-0.0662*	-0.0381*	-0.0847*	-0.0081	-0.0730*	0.2008*	-0.0323*	0.0052
Rx coverage in 2005	-0.0062	-0.0391*	-0.0500*	-0.0102	-0.0398*	-0.0380*	-0.0548*	-0.0027
Rx discount card	-0.0036	-0.0225	-0.0206	0.0013	-0.0166	0.0359*	-0.0432*	-0.0226
Did not fill Rx	0.0235	0.0127	0.0147	-0.0062	0.0155	-0.1299*	-0.0168	0.0389*
Uses mail order pharmacy	-0.0526*	-0.0645*	-0.1285*	-0.0256*	-0.1026*	0.0820*	0.0823*	-0.0225
Gets meds from non-US source	-0.0168	-0.0091	-0.0611*	-0.0144	-0.0402*	0.0223	-0.0086	-0.0074
Asks for generic meds	-0.0327*	-0.0155	-0.1039*	-0.0266*	-0.0705*	-0.0129	-0.0014	-0.0281*
Uses samples	-0.0155	-0.0326*	-0.0767*	-0.0079	-0.0514*	-0.013	-0.0479*	-0.008
Takes smaller doses	0.0527*	0.0750*	0.016	0.0159	0.0536*	-0.1463*	-0.0159	-0.0019

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Self-care Self-efficacy	Physician Communication	Health Information Seeking	Assertiveness	Overall PA	Age	Male	Employed
Compares drug prices	−0.0048	0.0085	−0.0457*	−0.0174	−0.0254*	−0.0155	−0.0235	−0.0072
Skips doses	0.0723*	0.0861*	0.0222	0.0118	0.0645*	−0.1428*	−0.0296*	−0.0031
Knowledge of Medicare discount card	−0.1312*	−0.1279*	−0.1023*	−0.0881*	−0.1606*	0.0132	0.0331*	0.0232
Knowledge of Part D	−0.1581*	−0.1365*	−0.1327*	−0.1036*	−0.1911*	0.0432*	0.0324*	0.0324*
Did not find information	0.0038	0.001	−0.0218	0.0017	−0.0072	0.0001	0.0053	−0.0017
Health last year	0.0743*	0.0724*	0.0541*	0.0303*	0.0817*	0.0223	−0.0016	−0.0583*
Number of preferences	0.0027	−0.0441*	−0.0750*	−0.0121	−0.0501*	−0.0460*	−0.0091	0.0308*
Number of information sources	−0.0415*	−0.0452*	−0.1139*	−0.0584*	−0.0993*	−0.0057	−0.0257*	0.0410*
Health status	0.1827*	0.1357*	0.1077*	0.0653*	0.1731*	−0.2507*	−0.0194	−0.1084*

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	High School Grad	Income < \$25K	Married	MSA	Number of Disease	Difficulty Seeing	Difficulty Hearing	Sight Prevents Learning About Medicare
High school grad	1							
Income < \$25k	−0.2906*	1						
Married	0.1196*	−0.4114*	1					
MSA	0.1129*	−0.0855*	−0.0074	1				
Number of diseases	−0.0576*	0.0865*	−0.0733*	−0.0396*	1			
Difficulty seeing	−0.0541*	0.0716*	−0.0383*	0.0218	0.1300*	1		
Difficulty hearing	0.0076	−0.0424*	0.0192	0.0123	0.1017*	0.1880*	1	

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	High School Grad	Income < \$25K	Married	MSA	Number of Disease	Difficulty Seeing	Difficulty Hearing	Sight Prevents Learning About Medicare
Sight affects learning about Medicare	−0.0579*	0.1068*	−0.0601*	−0.0063	0.1281*	0.4680*	0.1117*	1
Hearing affects learning about Medicare	−0.0560*	0.0302*	−0.0296*	−0.0082	0.0845*	0.1182*	0.3813*	0.2216*
ADL	−0.1035*	0.1046*	−0.0732*	−0.016	0.2846*	0.1353*	0.1235*	0.1091*
IADL	−0.0953*	0.1282*	−0.0876*	0.0065	0.2933*	0.1512*	0.1203*	0.1381*
Cognitive function	−0.0661*	0.1414*	−0.1125*	−0.0315*	0.2815*	0.1255*	0.0443*	0.0962*
Concentration	−0.0843*	0.1118*	−0.0733*	−0.0166	0.1466*	0.1327*	0.0607*	0.1278*
Makes own insurance decision	0.1408*	−0.0793*	−0.0497*	0.0173	−0.0573*	−0.0894*	−0.0939*	−0.0990*
Internet access	0.2668*	−0.3106*	0.2263*	0.0694*	−0.0490*	−0.0378*	0.0307*	−0.0844*
Literacy	0.5013*	−0.3028*	0.1741*	0.0479*	−0.1727*	−0.0648*	−0.0747*	−0.0877*
Need for Part D Information	−0.0379*	0.0405*	0.004	−0.0289*	0.0330*	0.0092	−0.0009	0.0152
Trouble or delaying care	−0.0309*	0.0846*	−0.0232	−0.0660*	0.0768*	0.0787*	0.02	0.1099*
Medicaid	−0.2500*	0.3789*	−0.2705*	−0.0485*	0.0752*	0.0635*	−0.0591*	0.0889*
HMO	0.0289*	−0.0387*	0.0458*	0.2230*	−0.0550*	−0.0024	0.0185	−0.0336*
ESI	0.1662*	−0.2964*	0.1548*	0.0262*	−0.0225	−0.0400*	0.0246*	−0.0562*
Tricare/Medigap	0.0660*	−0.0525*	0.0488*	−0.0704*	0.0078	−0.0218	0.0255*	−0.0057
Rx coverage in 2005	0.0431*	−0.0914*	0.0045	0.1535*	−0.0074	−0.0036	−0.0121	−0.0365*
Rx discount card	−0.0252*	0.0792*	−0.0193	−0.0843*	0.0563*	0.0353*	0.0289*	0.0283*
Did not fill Rx	0.0133	0.0232	−0.0332*	−0.0206	0.0657*	0.0577*	0.0179	0.0489*
Uses mail order pharmacy	0.1474*	−0.1736*	0.1471*	0.0308*	0.0599*	−0.0065	0.0554*	−0.0413*

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	High School Grad	Income < \$25K	Married	MSA	Number of Disease	Difficulty Seeing	Difficulty Hearing	Sight Prevents Learning About Medicare
Gets meds from non-US source	0.0204	−0.0061	0.0164	0.0376*	0.0049	−0.0034	−0.0018	−0.0168
Asks for generic meds	0.0259*	−0.0101	0.0583*	−0.0678*	0.0526*	0.0003	−0.0262*	0.0036
Uses samples	0.0111	0.0158	0.0011	−0.0505*	0.1114*	0.0675*	0.0277*	0.0158
Takes smaller doses	−0.0417*	0.1115*	−0.0426*	−0.0276*	0.0763*	0.1042*	0.0271*	0.0846*
Compares drug prices	−0.012	0.0324*	0.0389*	0.0083	0.0410*	0.0421*	−0.0054	0.0179
Skips doses	−0.0604*	0.1129*	−0.0572*	−0.0278*	0.0758*	0.0926*	0.0096	0.0866*
Knowledge of Medicare discount card	0.1020*	−0.1045*	0.0716*	0.0134	0.0214	0.0133	0.0278*	−0.0477*
Knowledge of Part D	0.1450*	−0.1419*	0.0808*	0.0059	0.0231	−0.0006	0.0557*	−0.0466*
Did not find information	−0.0013	0.0296*	−0.019	−0.0142	0.0253*	−0.0108	0.0132	−0.0028
Health status last year	−0.0386*	0.0305*	−0.0218	−0.0305*	0.1144*	0.0543*	0.0583*	0.0436*
Number of preferences	0.0550*	−0.0553*	0.0443*	0.0344*	0.0416*	0.0362*	0.0711*	0.0018
Number of information sources	0.0521*	−0.0068	0.0479*	−0.0497*	0.0734*	0.0450*	0.0329*	0.0189
Health status	−0.1747*	0.2268*	−0.0916*	−0.0853*	0.3069*	0.1331*	0.0097	0.1472*

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Hearing Prevents Learning About Medicare	ADL	IADL	Cognitive Function	Concentratio n	Makes Own Insurance Decisions	Internet Access	Literacy
Hearing affects learning about Medicare	1							
ADL	0.0815*	1						

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Hearing Prevents Learning About Medicare	ADL	IADL	Cognitive Function	Concentration	Makes Own Insurance Decisions	Internet Access	Literacy
IADL	0.1019*	0.4872*	1					
Cognitive function	0.0552*	0.1961*	0.2389*	1				
Concentration	0.0692*	0.1944*	0.2062*	0.4270*	1			
Makes own insurance decision	-0.0956*	-0.1094*	-0.1687*	-0.1146*	-0.1125*	1		
Internet access	-0.0484*	-0.0589*	-0.0633*	-0.006	-0.0357*	0.0696*	1	
Literacy	-0.0915*	-0.2112*	-0.2280*	-0.0523*	-0.0854*	0.1555*	0.3204*	1
Need for Part D information	0.0016	0.0026	0.0241	0.0367*	0.0204	-0.0356*	-0.006	-0.0349*
Trouble or delaying care	0.0505*	0.1532*	0.1228*	0.1887*	0.1419*	-0.0217	0.0105	-0.008
Medicaid	0.0164	0.1052*	0.1461*	0.2005*	0.1515*	-0.1072*	-0.1765*	-0.1117*
HMO	-0.0042	-0.0412*	-0.0618*	-0.0605*	-0.0598*	0.0343*	0.0058	0.0076
ESI	-0.0415*	-0.0487*	-0.0713*	-0.0952*	-0.0574*	0.0665*	0.1343*	0.1293*
Tricare/Medigap	0.0258*	-0.0275*	-0.0248*	-0.0703*	-0.0502*	-0.0068	0.0279*	-0.0221
Rx coverage in 2005	-0.0363*	-0.0039	-0.0098	-0.0044	-0.0104	0.0229	0.0404*	0.0742*
Rx discount card	0.0341*	0.0317*	0.0262*	0.0254*	0.0199	-0.0434*	-0.0149	-0.0399*
Did not fill Rx	0.0302*	0.0553*	0.0516*	0.1057*	0.0882*	0.0098	0.0282*	0.0411*
Uses mail order pharmacy	-0.0022	-0.0212	-0.0143	-0.0490*	-0.0572*	0.0290*	0.1340*	0.0866*
Gets meds from non-US source	-0.0213	0.0066	0.0065	-0.0307*	-0.0321*	0.0022	0.0461*	0.0087
Asks for generic meds	0.0096	0.0184	0.0412*	0.0038	-0.0015	0.0081	0.0242	0.0144
Uses samples	0.0235	0.0745*	0.0744*	0.0658*	0.0583*	-0.0103	0.0241	-0.0046
Takes smaller doses	0.0538*	0.0864*	0.0952*	0.1241*	0.1240*	-0.0368*	-0.0111	-0.0265*

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Hearing Prevents Learning About Medicare	ADL	IADL	Cognitive Function	Concentratio n	Makes Own Insurance Decisions	Internet Access	Literacy
Compares drug prices	0.0280*	0.0224	0.0386*	0.0172	0.0295*	-0.0228	0.0138	-0.021
Skips doses	0.0458*	0.0912*	0.0934*	0.1266*	0.1202*	-0.0341*	-0.0195	-0.0427*
Knowledge of Medicare discount card	-0.0268*	-0.0154	-0.0274*	-0.0254*	-0.0196	0.0613*	0.1069*	0.1013*
Knowledge of Medicare Part D	-0.0178	-0.0077	-0.0184	-0.0369*	-0.0286*	0.0643*	0.1346*	0.1174*
Did not find information	0.0260*	0.0058	0.0137	0.0263*	-0.0001	-0.0134	0.0023	-0.0092
Health last year	0.0566*	0.2113*	0.1727*	0.0728*	0.1200*	-0.015	-0.0607*	-0.1592*
Number of preferences	-0.0036	0.0374*	0.0344*	0.0272*	0.0137	-0.0380*	0.1113*	0.0953*
Number of information sources	-0.0051	0.0132	0.0236	0.009	-0.0039	-0.0192	0.0949*	0.0551*
Health status	0.0673*	0.3231*	0.3460*	0.2496*	0.2083*	-0.0864*	-0.1318*	-0.3505*

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Needs Information on Part D	Trouble or Delayed Care	Medicaid	HMO	ESI	Tricare/Medigap	Rx Coverage in 2005	Drug Discount Card
Need for Part D information	1							
Trouble or delaying care	0.0361*	1						
Medicaid	0.0097	0.0948*	1					
HMO	-0.0428*	-0.0159	-0.1891*	1				
ESI	-0.0799*	-0.0822*	-0.3299*	-0.2869*	1			
Tricare/Medigap	0.0821*	-0.0777*	-0.2446*	-0.1520*	-0.4462*	1		

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Needs Information on Part D	Trouble or Delayed Care	Medicaid	HMO	ESI	Tricare/Medigap	Rx Coverage in 2005	Drug Discount Card
Rx coverage in 2005	−0.1165*	−0.0660*	0.1209*	0.1636*	0.3170*	−0.3127*	1	
Rx discount card	0.0826*	0.0385*	−0.0426*	−0.0496*	−0.1547*	0.1729*	−0.3357*	1
Did not fill Rx	0.0298*	0.1893*	0.0495*	−0.015	−0.0447*	−0.0155	−0.0446*	0.0419*
Uses mail order pharmacy	−0.0438*	−0.0441*	−0.1863*	−0.0109	0.2479*	−0.0572*	0.0717*	−0.0177
Gets meds from non-US source	0.0615*	−0.0023	−0.0227	0.0232	−0.0598*	0.0764*	−0.0983*	0.0309*
Asks for generic meds	0.0595*	0.0514*	−0.0529*	−0.0141	−0.0282*	0.0785*	−0.1001*	0.1032*
Uses samples	0.0495*	0.0827*	−0.0263*	−0.0952*	0.0266*	0.0566*	−0.0982*	0.1125*
Takes smaller doses	0.0421*	0.2299*	0.0867*	−0.0009	−0.0633*	−0.0544*	−0.0579*	0.0594*
Compares drug prices	0.0847*	0.0808*	−0.0338*	−0.0015	−0.1010*	0.1112*	−0.1919*	0.1406*
Skips doses	0.0431*	0.2421*	0.0967*	−0.0111	−0.0643*	−0.0499*	−0.0674*	0.0565*
Knowledge of Medicare discount card	0.0254*	−0.0280*	−0.0957*	0.0376*	0.0431*	0.0423*	0.02	0.0923*
Knowledge of Part D	0.0093	−0.0299*	−0.1419*	0.0205	0.0681*	0.0622*	−0.0029	0.0755*
Did not find information	0.0379*	0.012	0.0041	−0.0111	−0.0186	0.0213	−0.0244	0.0118
Health status compared to last year	0.0242	0.1045*	0.0271*	−0.0353*	0.0001	−0.0186	−0.0184	0.0165
Number of preferences	0.1067*	0.0339*	−0.0197	−0.0510*	0.0157	0.0298*	−0.0227	0.0834*
Number of information sources	0.1658*	0.0520*	−0.0291*	−0.0631*	−0.1018*	0.1685*	−0.1715*	0.1881*
Health status	0.0404*	0.1668*	0.2696*	−0.0715*	−0.1224*	−0.1112*	−0.0432*	0.0178

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Did Not Fill Rx	Uses Mail Order Pharmacy	Gets Meds from Non-US Source	Asks for Generic Meds	Uses Samples	Takes Smaller Doses	Compares Drug Prices	Skips Doses
Did not fill Rx	1							
Uses mail order pharmacy	−0.0341*	1						
Gets meds from non-US source	0.0051	0.2940*	1					
Asks for generic meds	0.0427*	0.1412*	0.1832*	1				
Uses samples	0.0798*	0.1168*	0.1666*	0.2742*	1			
Takes smaller doses	0.1356*	0.1460*	0.3381*	0.1815*	0.2134*	1		
Compares drug prices	0.0509*	0.1227*	0.3636*	0.3104*	0.3144*	0.2740*	1	
Skips doses	0.1484*	0.1312*	0.3443*	0.1692*	0.2109*	0.7969*	0.2781*	1
Knowledge of Medicare discount card	0.017	0.0707*	−0.0039	0.0068	0.0263*	−0.0236	0.0204	−0.0272*
Knowledge of Part D	−0.0064	0.1001*	0.0157	0.0453*	0.0412*	−0.0118	0.0371*	−0.02
Did not find information	−0.0098	−0.0057	0.019	0.0097	0.0157	0.009	0.0227	0.0176
Health status compared to last year	0.0204	−0.0062	0.009	0.0114	0.0409*	0.0728*	0.0169	0.0643*
Number of preferences	0.0582*	0.0430*	0.0318*	0.0479*	0.0689*	0.0521*	0.0567*	0.0413*
Number of information sources	0.0706*	0.0049	0.0925*	0.1018*	0.1188*	0.0467*	0.1372*	0.0478*
Health status	0.0529*	−0.0675*	−0.0011	0.0519*	0.0601*	0.1558*	0.0473*	0.1521*

Table 46. Correlation Matrix of Patient Variables Used in Aim 2

	Knowledge of Medicare Discount Card	Knowledge of Part D	Did Not Find Information	Health Status Compared to Last Year	Number of Preferences	Number of Information Sources	Health Status
Knowledge of Medicare discount card	1						
Knowledge of Part D	0.4655*	1					
Did not find information	-0.0134	-0.0042	1				
Health status compared to last year	-0.0217	-0.0143	-0.006	1			
Number of preferences	0.0940*	0.0937*	-0.0127	-0.019	1		
Number of information sources	0.0928*	0.1176*	-0.0555*	-0.0024	0.2230*	1	
Health status	-0.0693*	-0.0715*	0.0024	0.2667*	-0.0322*	-0.0056	1

ADL = activities of daily living; ESI = employer-sponsored insurance; IADL = interactive activities of daily living; HMO = health maintenance organization; MSA = metropolitan statistical area; PA = patient activation; Rx = prescription drug; US = United States

APPENDIX E: MODEL FIT STATISTICS

Table 47. Aim 1: Model Fit Statistics for PA Domains and Overall Summary Score

Modified Park Test Results						Model Fit Statistics				
	Coef.	<i>p</i> Values				Distribution	Log Link		Identity Link	
		Gamma	Poisson	Inverse Gaussian	Gaussian		Deviance	BIC	Deviance	BIC
SCSE	1.91	0.49	0.00	0.00	0.00	Gamma	907.98	−81483.00	908.04	−81483.00
PC	2.32	0.02	0.00	0.00	0.00	Gamma	875.67	−81515.34	873.87	−81517.14
						Inverse Gaussian	55.24	−82335.77	55.14	−82335.87
Assertiveness	1.44	0.00	0.02	0.00	0.00	Gamma	1340.65	−81050.36	1341.04	−81049.97
						Poisson	22987.77	−59403.24	22995.40	−59395.61
Health information	1.08	0.47	0.00	0.00	0.00	Gamma	21251.44	−61139.57	21256.02	−61134.99
Overall PA score	1.97	0.87	0.00	0.00	0.00	Gamma	466.23	−81924.78	466.53	−81924.48

BIC = Bayesian information criteria; Coef. = coefficient; PC = physician communication; SCSE = self-care/self efficacy

Table 48. Aim 3: Model Fit Statistics for PA Domains and Overall Summary Score

Modified Park Test Results						Model Fit Statistics				
	Coef.	p Values				Distribution	Log Link		Identity Link	
		Gamma	Poisson	Inverse Gaussian	Gaussian		Deviance	BIC	Deviance	BIC
SCSE										
White	1.88	0.45	0.00	0.00	0.00	Gamma	696.93	−63043.19	697.03	−63043.09
Black	1.12	0.01	0.69	0.00	0.00	Poisson	1535.93	−3871.94	1536.19	−3871.69
Hispanic	1.00	0.01	1.00	0.00	0.01	Poisson	1233.79	−2931.00	1231.94	−2932.85
PC										
White	2.15	0.37	0.00	0.00	0.00	Gamma	667.63	−63072.49	666.30	−63073.82
Black	2.35	0.32	0.00	0.06	0.00	Gamma	85.85	−5322.02	85.27	−5322.60
						Inverse Gaussian	5.12	−5402.76	5.09	−5402.79
Hispanic	1.60	0.29	0.12	0.00	0.00	Gamma	75.22	−4089.58	75.16	−4089.64
						Poisson	1255.62	−2909.17	1255.93	−2908.86
Assertiveness										
White	1.50	0.02	0.03	0.00	0.00	Gamma	1064.72	−62675.39	1065.18	−62674.93
						Poisson	18248.31	−45491.81	18257.18	−45482.94
Black	1.39	0.16	0.37	0.00	0.00	Poisson	1981.89	−3425.99	1988.63	−3419.25
						Gamma	116.18	−5291.70	116.40	−5291.48
Hispanic	1.18	0.08	0.70	0.00	0.01	Poisson	1471.60	−2693.19	1470.13	−2694.67
						Gamma	85.71	−4079.08	85.54	−4079.25
Health information seeking										

Table 48. Aim 3: Model Fit Statistics for PA Domains and Overall Summary Score

Modified Park Test Results						Model Fit Statistics				
	Coef.	p Values				Distribution	Log Link		Identity Link	
		Gamma	Poisson	Inverse Gaussian	Gaussian		Deviance	BIC	Deviance	BIC
White	1.20	0.00	0.15	0.00	0.00	Poisson	16654.20	−47085.92	16666.85	−47073.27
Black	0.38	0.00	0.03	0.00	0.19	Gaussian	40138.75	34730.88	40106.01	34698.13
Hispanic	0.53	0.00	0.13	0.00	0.09	Gaussian	38789.44	34624.65	38801.18	34636.38
						Poisson	1641.86	−2522.93	1640.24	−2524.56
Overall PA Score										
White	1.98	0.90	0.00	0.00	0.00	Gamma	365.65	−63374.47	365.90	−63374.22
Black	1.70	0.49	0.10	0.00	0.00	Gamma	41.30	−5366.58	41.23	−5366.65
						Poisson	784.29	−4623.59	784.07	−4623.80
Hispanic	0.78	0.01	0.64	0.00	0.11	Gaussian	11477.39	7312.60	11516.97	7352.17
						Poisson	592.08	−3572.71	593.31	−3571.49

BIC = Bayesian information criteria; Coef. = coefficient; PA = patient activation; PC = physician communication; SCSE = self-care self-efficacy

Table 49. Probit Regression Models Predicting Nonpreferred Use (N = 2,467)

	Without Instruments			With Instruments		
	Coef.	SE	p Value	Coef.	SE	p Value
PA domains						
SCSE	0.02	0.01	0.01*	0.02	0.01	0.01*
PC	−0.01	0.01	0.09	−0.01	0.01	0.09
HIS	0.00	0.01	0.45	0.00	0.01	0.46
Assertiveness	−0.01	0.01	0.30	−0.01	0.01	0.31
PA summary score						
Sociodemographics						
<i>Race/ethnicity (ref. white)</i>						
Black	−0.07	0.15	0.64	−0.06	0.15	0.67
Hispanic	0.03	0.15	0.84	0.02	0.15	0.89
Other	−0.36	0.23	0.11	−0.36	0.22	0.11
Age in years	0.00	0.00	0.91	0.00	0.00	0.90
Male	0.04	0.07	0.56	0.04	0.07	0.58
Employed	−0.14	0.11	0.23	−0.13	0.11	0.25
High school graduate	0.08	0.09	0.37	0.09	0.09	0.35
Income < \$25	0.00	0.08	0.95	0.00	0.08	0.96
Married	0.02	0.08	0.80	0.02	0.08	0.85
MSA	0.01	0.14	0.97	0.01	0.14	0.95
Physical and cognitive functioning						
<i>Health status (ref. fair/poor)</i>						
Excellent/very good	−0.02	0.12	0.88	−0.02	0.12	0.85
Good	0.01	0.10	0.90	0.01	0.10	0.96
<i>Health status compared to last year (ref. worse)</i>						
Better	0.08	0.10	0.44	0.08	0.10	0.42
Same	0.09	0.09	0.32	0.09	0.09	0.31
Number of disease	0.00	0.02	0.81	0.00	0.02	0.81
Problems seeing	0.05	0.09	0.60	0.04	0.09	0.61
Problems hearing	0.21	0.09	0.02*	0.21	0.09	0.02*
Seeing causes problems learning about Medicare	−0.04	0.13	0.76	−0.04	0.13	0.78

Table 49. Probit Regression Models Predicting Nonpreferred Use (N = 2,467)

	Without Instruments			With Instruments		
	Coef.	SE	p Value	Coef.	SE	p Value
Hearing causes problems learning about Medicare	-0.29	0.13	0.03*	-0.28	0.13	0.03*
ADL	0.11	0.09	0.20	0.12	0.09	0.19
IADL	-0.03	0.09	0.73	-0.03	0.09	0.76
Poor cognitive function	-0.12	0.09	0.17	-0.12	0.09	0.17
Problems concentrating	0.06	0.12	0.61	0.06	0.12	0.62
Makes own insurance decisions	0.14	0.08	0.08	0.14	0.08	0.09
Access to information						
Has Internet access	-0.08	0.08	0.29	-0.08	0.08	0.32
Adequate literacy	0.16	0.10	0.09	0.16	0.10	0.09
Need						
Needed information about Medicare Part D	0.12	0.10	0.22	0.12	0.09	0.22
Access to prescription drugs						
Rx coverage 2005	0.20	0.09	0.03*	0.19	0.09	0.03*
Rx discount card	0.24	0.09	0.01*	0.23	0.09	0.01*
Did not fill need medication	0.47	0.18	0.01*	0.46	0.18	0.01*
Uses mail order pharmacy	0.02	0.09	0.79	0.03	0.09	0.76
Gets medications from outside of the United States	-0.09	0.16	0.57	-0.09	0.16	0.59
Asks for generic medications	-0.10	0.08	0.23	-0.09	0.08	0.26
Uses samples	0.03	0.08	0.73	0.03	0.08	0.72
Takes a smaller dose than prescribed	0.11	0.22	0.62	0.11	0.22	0.63
Compares drug prices	0.05	0.09	0.55	0.05	0.09	0.56
Skips doses	0.00	0.21	0.99	0.01	0.21	0.98
Access to care						
Had trouble or delayed getting care	0.10	0.13	0.44	0.11	0.13	0.42
Supplemental insurance						
Medicaid	-0.09	0.14	0.51	-0.10	0.14	0.49
HMO	-0.04	0.17	0.82	-0.04	0.17	0.82
ESI	0.02	0.15	0.89	0.02	0.15	0.87

Table 49. Probit Regression Models Predicting Nonpreferred Use (N = 2,467)

	Without Instruments			With Instruments		
	Coef.	SE	<i>p</i> Value	Coef.	SE	<i>p</i> Value
Tricare/Medigap	−0.12	0.12	0.33	−0.11	0.12	0.34
Information sources						
Number of information sources	0.46	0.07	0.00*	0.46	0.07	0.00*
Prior knowledge						
Discount card				0.11	0.09	0.21
Medicare Part D				−0.09	0.08	0.29

**p* < 0.05

ADL = activities of daily life; Coef. = coefficient; ESI = employer-sponsored insurance; HIS = health information seeking; HMO = health maintenance organization; IADL = interactive activities of daily living; MSA = metropolitan statistical area; N = number; PA = patient activation; PC = physician communication; ref. = reference group; Rx = prescription drug; SCSE = self-care self-efficacy

Table 50. Models Predicting Self-care Self-efficacy Stratified by Race

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>
Thorough	0.597	0.928	0.522	−0.911	1.039	0.383	−1.763	2.488	0.480
Confident	−1.265	0.958	0.189	−0.747	1.266	0.556	−0.035	1.522	0.982
Lacks compassion	−2.876	0.860	0.001	−1.857	0.822	0.026	0.977	0.944	0.303
Hurried care	0.760	0.511	0.140	1.093	0.728	0.136	−0.407	1.195	0.734
Content knowledge	−1.067	0.893	0.235	0.064	1.078	0.952	0.084	2.032	0.967
Concerned	0.186	0.770	0.810	−0.766	1.189	0.521	−0.178	1.391	0.898
Married	−0.250	0.580	0.667	−0.799	0.489	0.105	−1.458	0.779	0.064
Lives alone	0.350	0.530	0.511	−0.158	0.639	0.805	−0.769	0.853	0.369
No children alive	0.745	0.830	0.371	0.143	0.831	0.864	−0.232	0.961	0.810
One kid living	0.444	0.561	0.431	0.437	0.634	0.493	−0.721	0.802	0.371
Two children living	−0.270	0.440	0.540	−0.325	0.654	0.620	−0.491	0.787	0.534
Takes helper to the doctor	0.750	0.403	0.065	1.166	0.423	0.007	−0.082	0.603	0.892
Lives in community housing	−0.520	0.690	0.453	0.927	0.937	0.325	−0.842	1.383	0.544
MSA	0.745	0.676	0.273	−0.425	0.853	0.619	1.715	1.272	0.180
Age in years	0.034	0.020	0.087	0.098	0.024	0.000	0.047	0.032	0.141
Male	0.483	0.434	0.268	0.577	0.623	0.357	0.087	0.683	0.899
Employed	1.022	0.579	0.080	0.689	0.838	0.413	0.617	1.222	0.615
High school graduate	−0.929	0.618	0.136	−0.728	0.636	0.255	−1.033	0.603	0.090
Income < \$25K	1.203	0.383	0.002	1.565	0.653	0.018	0.835	0.761	0.275

Table 50. Models Predicting Self-care Self-efficacy Stratified by Race

	White			Black			Hispanic		
	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>
Excellent/very good	−0.966	0.598	0.109	−1.500	0.761	0.051	−1.711	0.626	0.007
Good	0.198	0.517	0.702	0.400	0.742	0.591	−0.186	0.615	0.763
Better	−0.968	0.634	0.130	−1.365	0.677	0.046	−0.427	0.641	0.507
Same	1.336	0.593	0.026	0.117	0.653	0.858	−0.986	0.541	0.071
Number of disease	0.015	0.096	0.879	−0.247	0.112	0.030	0.143	0.117	0.225
Problems seeing	0.329	0.346	0.344	1.630	0.501	0.002	0.261	0.622	0.675
Problems hearing	1.402	0.426	0.001	0.697	0.665	0.297	−0.003	0.782	0.997
At least 1 ADL	0.157	0.490	0.750	−0.251	0.571	0.661	1.029	0.810	0.207
At least 1 IADL	0.552	0.461	0.234	−0.755	0.547	0.171	−0.123	0.680	0.857
Poor cognitive function	0.719	0.547	0.191	0.936	0.684	0.174	−0.770	0.595	0.198
Problems concentrating	0.710	0.613	0.249	0.197	0.916	0.830	2.431	0.926	0.010
Adequate literacy	−0.303	0.508	0.552	−0.561	0.675	0.407	−0.685	0.867	0.431
Trouble getting care	−0.536	1.044	0.609	−0.688	0.982	0.485	−0.740	0.980	0.452
Delayed getting care	1.275	0.839	0.132	0.192	0.758	0.801	−0.938	0.867	0.282
Medicaid	−0.133	0.855	0.876	1.686	0.739	0.025	−0.131	0.940	0.889
HMO	−0.429	0.728	0.557	0.340	0.964	0.725	0.270	0.922	0.770
ESI	0.299	0.638	0.640	−0.666	0.795	0.405	−0.817	0.986	0.409
Tricare/Medigap	−0.428	0.555	0.442	−0.415	0.794	0.603	−0.648	1.182	0.585
Constant	13.317	2.142	0.000	13.594	3.091	0.000	17.325	3.581	0.000
N	866			841			677		

Table 50. Models Predicting Self-care Self-efficacy Stratified by Race

White			Black			Hispanic		
Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>

ADL = activities of daily life; Coef. = coefficient; ESI = employer-sponsored insurance; IADL = interactive activities of daily life; HMO = health maintenance organization; MSA = metropolitan statistical area; N = number

Table 51. Full Interacted Model Predicting Self-care Self-efficacy (N = 2,384)

	Main Effects			Black Interactions			Hispanic Interactions			Full Effect	
	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Black	Hispanic
Thorough	0.597	0.928	0.522	−1.508	1.419	0.290	−2.360	2.834	0.407	−0.911	−1.763
Confident	−1.265	0.958	0.189	0.518	1.436	0.719	1.230	1.803	0.496	−0.747	−0.035
Lacks compassion	−2.876	0.860	0.001	1.019	1.138	0.372	3.853	1.333	0.005	−1.857	0.977
Hurried care	0.760	0.511	0.140	0.333	0.868	0.702	−1.168	1.245	0.350	1.093	−0.407
Content knowledge	−1.067	0.893	0.235	1.131	1.403	0.422	1.150	2.200	0.602	0.064	0.084
Concerned	0.186	0.770	0.810	−0.952	1.505	0.529	−0.364	1.604	0.821	−0.766	−0.178
Married	−0.250	0.580	0.667	−0.549	0.753	0.467	−1.208	0.936	0.199	−0.799	−1.458
Lives alone	0.350	0.530	0.511	−0.508	0.897	0.572	−1.119	1.007	0.269	−0.158	−0.769
No children alive	0.745	0.830	0.371	−0.602	1.203	0.618	−0.977	1.310	0.457	0.143	−0.232
One kid living	0.444	0.561	0.431	−0.007	0.873	0.994	−1.164	1.009	0.251	0.437	−0.721
Two children living	−0.270	0.440	0.540	−0.055	0.818	0.947	−0.220	0.906	0.808	−0.325	−0.491
Takes helper to the doctor	0.750	0.403	0.065	0.415	0.585	0.479	−0.833	0.662	0.211	1.166	−0.082
Lives in community housing	−0.520	0.690	0.453	1.447	1.089	0.187	−0.322	1.393	0.818	0.927	−0.842
MSA	0.745	0.676	0.273	−1.170	1.108	0.293	0.970	1.117	0.387	−0.425	1.715
Age in years	0.034	0.020	0.087	0.063	0.032	0.053	0.013	0.037	0.734	0.098	0.047
Male	0.483	0.434	0.267	0.094	0.757	0.902	−0.397	0.794	0.618	0.577	0.087
Employed	1.022	0.579	0.080	−0.333	1.057	0.753	−0.405	1.299	0.756	0.689	0.617
High school graduate	−0.929	0.618	0.136	0.201	0.876	0.819	−0.104	0.840	0.901	−0.728	−1.033
Income < \$25K	1.203	0.383	0.002	0.363	0.742	0.626	−0.368	0.824	0.656	1.565	0.835

Table 51. Full Interacted Model Predicting Self-care Self-efficacy (N = 2,384)

	Main Effects			Black Interactions			Hispanic Interactions			Full Effect	
	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Black	Hispanic
Excellent/very good	−0.966	0.598	0.109	−0.533	0.931	0.568	−0.745	0.908	0.414	−1.500	−1.711
Good	0.198	0.517	0.702	0.202	0.819	0.805	−0.384	0.814	0.638	0.400	−0.186
Better	−0.968	0.634	0.130	−0.398	0.815	0.627	0.541	0.874	0.537	−1.365	−0.427
Same	1.336	0.593	0.026	−1.219	0.809	0.135	−2.322	0.792	0.004	0.117	−0.986
Number of disease	0.015	0.096	0.879	−0.262	0.157	0.098	0.129	0.137	0.349	−0.247	0.143
Problems seeing	0.329	0.346	0.344	1.301	0.619	0.038	−0.068	0.696	0.923	1.630	0.261
Problems hearing	1.402	0.426	0.001	−0.704	0.801	0.381	−1.405	0.845	0.099	0.697	−0.003
At least 1 ADL	0.157	0.490	0.750	−0.408	0.810	0.616	0.872	0.974	0.372	−0.251	1.029
At least 1 IADL	0.552	0.461	0.233	−1.307	0.736	0.078	−0.675	0.862	0.435	−0.755	−0.123
Poor cognitive function	0.719	0.547	0.191	0.217	0.898	0.810	−1.489	0.825	0.074	0.936	−0.770
Problems concentrating	0.710	0.613	0.249	−0.513	1.214	0.673	1.721	1.023	0.095	0.197	2.431
Adequate literacy	−0.303	0.508	0.552	−0.258	0.886	0.771	−0.382	0.992	0.701	−0.561	−0.685
Trouble getting care	−0.536	1.044	0.609	−0.153	1.502	0.919	−0.204	1.373	0.882	−0.688	−0.740
Delayed getting care	1.275	0.839	0.131	−1.083	1.251	0.389	−2.213	1.313	0.095	0.192	−0.938
Medicaid	−0.133	0.855	0.876	1.819	1.172	0.123	0.002	1.267	0.999	1.686	−0.131
HMO	−0.429	0.728	0.557	0.768	1.252	0.540	0.698	1.180	0.555	0.340	0.270
ESI	0.299	0.638	0.640	−0.965	1.043	0.357	−1.116	1.094	0.310	−0.666	−0.817
Tricare/Medigap	−0.428	0.555	0.442	0.013	0.955	0.989	−0.221	1.296	0.865	−0.415	−0.648
Black	0.277	3.993	0.945								
Hispanic	4.008	3.982	0.316								

Table 51. Full Interacted Model Predicting Self-care Self-efficacy (N = 2,384)

	Main Effects			Black Interactions			Hispanic Interactions			Full Effect	
	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Coef.	SE	<i>p</i> > <i>t</i>	Black	Hispanic
Constant	13.317	2.142	0.000								

ADL = activities of daily living; Coef. = coefficient; ESI = employer-sponsored insurance; IADL = interactive activities of daily living; HMO = health maintenance organization; MSA = metropolitan statistical area; N = number

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