Stress, Gender, Cognitive Impairment, and Outpatient Physician Use in Later Life

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The purpose of this study was to look at the interface between stressful life events, gender, cognitive impairment, and the use of outpatient physician services among older adults. A theoretical rationale is presented, suggesting that older men who are suffering from either mild or moderate levels of cognitive impairment are especially likely to use outpatient physician services when they are confronted by undesirable stressful events. Analyses with data provided by a nationwide sample of elderly people provide support for this complex three-way interaction.

Most researchers are familiar with data on the costs of providing health care to older adults. Although elderly people make up about 12% of the population, they consume roughly one-third of the total health care expenditures (Department of Health and Human Services, 1990). This disparity is highlighted in the work of Frateschi and Furner (1993). These investigators report that the per capita personal health expenditures for people under age 65 in 1987 was $1,286 per person, whereas the corresponding figure for those 65 and over was $5,360. It is especially important for the purposes of the present study to point out that about 21% of these expenditures are for physician services, including costs for outpatient physician visits (Furner & Kozak, 1993). These costs are noteworthy because recent decades have seen a decline in the use of inpatient services and an increase in the use of outpatient care (Health Care Finance Administration, 1987).

Given the figures associated with the use of medical care, it is not surprising to find widespread interest in the development of effective cost-containment policies. A necessary first step in devising such policies is to understand the reasons for disproportionately greater service use in later life (e.g., Wolinsky & Johnson, 1991). A host of factors have been identified in the literature (see Wan, 1989, for a review of this research). However, the purpose of the present study is to extend findings provided by a small but growing body of research that has its roots in the gerontological literature, and that brings to the foreground issues and problems that are encountered frequently by older adults. Taking this observation as a point of departure, the rationale described below attempts to contribute to the knowledge base by forging a link between cognitive functioning, stress, and outpatient physician utilization in later life.

In an effort to better understand the potentially important role played by psychosocial factors in health care utilization, a number of investigators have examined the link between stressful life events and outpatient physician use (e.g., Cheng, 1992; Counte & Glandon, 1991; Krause, 1988; Pilisuk, Boylan, & Acredolo, 1987). Although these studies generally show that stress is associated with increased physician use, the intervening mechanisms linking these constructs have not been explicated fully. Several potentially important factors have been identified in the literature. For example, some researchers suggest that stress may play a role in the genesis of physical health problems, and that increased use is associated with the emergence of stress-induced physical complaints (e.g., Krause, 1990). Other investigators argue that rather than causing illness per se, stress may simply heighten sensitivity to physical symptoms that have arisen from other causes (e.g., Hansel, Mechanic, & Feinson, 1985). According to this view, these physical symptoms would have been largely overlooked and would not have led to an office visit in the absence of stress. Finally, other researchers maintain that stress is linked to increased psychological distress, and that elderly people...
seek outpatient care for their mental rather than their physical health problems (e.g., Phillips & Murrell, 1994).

Although these studies have made valuable contributions to the literature, they fail to fully exploit what is already known about the complex nature of the stress process. In order to see why this is the case, it is helpful to reexamine what happens when individuals are first confronted by an unpleasant event. Research reviewed by Eckenrode and Wethington (1990) suggests that when people experience an undesirable stressor, they initially attempt to resolve the difficulty on their own. If they are unable to do so, they subsequently turn to significant others for assistance. However, this perspective presupposes that an individual either has the wherewithal to resolve the event on his/her own, or that he has the proclivity to turn to social network members for help, should personal resources prove to be inadequate. There are several reasons why neither of these conditions may hold for some older adults.

There is now substantial evidence that rates of cognitive impairment increase sharply with age (e.g., George, Landerman, Blazer, & Anthony, 1991). In particular, this research shows that about 5% of community-dwelling elders between the ages of 55 and 64 suffer from either mild or severe cognitive impairment. However, by age 85, about 25% of older adults fall into this group. Given this disturbing trend, George and colleagues were somewhat surprised to find a "virtual absence" of research on the interface between cognitive impairment and health services use among older adults (George et al., 1991, p. 314). Even so, these investigators failed to find a significant relationship between cognitive impairment and the use of general medical services in later life.

In order to understand why George et al. (1991) were unable to find a significant relationship between cognitive functioning and health services utilization, it is important to consider why these constructs may be related. Although a number of factors undoubtedly come into play, a central premise in the present study is that we may be able to learn more if we view the problem from a stress perspective, and focus on the interface between life events and cognitive functioning.

In essence, the notion that individuals attempt to initially resolve problems on their own serves as a segue to the vast literature on coping responses (see Aldwin, 1994, for a review of this research). While the utility of any given coping response rests, in part, on the nature of the specific problem at hand, it is frequently the case that problem-focused coping strategies are especially efficacious (Lazarus, 1993). According to the widely used scheme developed by Lazarus, problem-focused coping involves taking deliberate action to either eradicate or offset a stressful experience (Lazarus, 1966). Planful problem-solving represents one specific type of problem-focused coping. This dimension is measured in the Ways of Coping Scale with items such as the following: "I came up with a couple of different solutions to the problem" (Folkman & Lazarus, 1988). However, a moment's reflection suggests that individuals must possess a fairly sound level of cognitive functioning, in order to devise alternative strategies and then implement the most promising option. As the data presented by George et al. (1991) suggest, this assumption may not be justified for a significant number of elderly people.

Planful problem solving is obviously not the only type of coping strategy available to older adults. Consistent with the observations of Eckenrode and Wethington (1990), those who are unable to resolve a stressor with an individual problem-focused coping strategy may turn to others for support. In fact, seeking social support is included in virtually all coping response inventories (e.g., Moos & Schaefer, 1986). Nevertheless, evidence suggests that there are considerable variations in the extent to which elderly people are willing or able to mobilize their social support networks. Although many factors undoubtedly are involved in the decision to seek help, gender and cognitive functioning may play an important role.

Research by Folkman, Lazarus, Pimley, and Novacek (1987) suggests that men are generally more inclined to use planful problem-solving strategies, while women are more likely to rely on seeking social support. This is consistent with a vast body of literature which indicates that older women have larger social networks than elderly men, and that they exchange support with their significant others more frequently than their male counterparts (Antonucci, 1990). As research reviewed by Gore and Colten (1991) indicates, women are more inclined than men to seek out others during difficult times because fundamental differences in the socialization process encourage them to place a greater value on the opinions of others. Moreover, women are better equipped to take advantage of informal support because they are thought to possess greater social skills than men.

In addition to being affected by gender, several studies suggest that the tendency to utilize support networks in later life may also be influenced by cognitive functioning (e.g., Cerhan & Wallace, 1993). In particular, this research indicates that older adults who are cognitively impaired tend to have fewer friendship ties, and find interaction with others to be less satisfying than elderly people who are not troubled by cognitive deficits (e.g., Henderson et al., 1986; Wenger, 1994).

The argument developed up to this point suggests that rates of outpatient physician utilization may be higher for cognitively impaired older adults who are exposed to negative life events. Moreover, this relationship is more likely to hold for older men than for elderly women because of gender differences in the strategies that are used to cope with undesirable stressors. Even so, this rationale is not developed fully. In particular, it is still not entirely clear why stress and cognitive impairment should lead specifically to greater use of outpatient health care services, instead of being manifest in some other way. However, by reviewing three related bodies of research, it may be possible to sketch out a plausible explanation. The first deals with norms surrounding the exchange of informal support; the second has to do with the way that many elderly people perceive mental health professionals; and the third concerns the way in which older adults express symptoms of distress.

According to Lee (1985), the current cohort of elderly people adheres strongly to the norm of reciprocity; they do not want to receive support from others unless they are able to reciprocate. Failure (or the inability) to reciprocate can
lead to feelings of dependence that may, in turn, be associated with diminished feelings of well-being in later life (Krause, 1987). Based on the notion that independence and autonomy are valued highly among older adults, Lee (1985) suggests that elders may actually prefer to receive assistance from formal sources, because the norm of reciprocity that governs informal exchanges does not hold in this context, and elders do not have to worry about paying anyone back for the help they have received.

Many stressful events may be thought of as personal or psychosocial problems in living. Consequently, various forms of psychological counseling are often viewed as appropriate mechanisms for dealing with stressful events in a formal setting (see Palmer & Dryden, 1995, for a recent discussion of stress-oriented counseling strategies). However, research consistently shows that older adults are averse to the use of mental health professionals (e.g., Schurman, Kramer, & Mitchell, 1985; Waxman, Carner, & Klein, 1984; Waxman, McCreary, Weinrit, & Carner, 1985). Moreover, there is some evidence that older men may be more inclined than elderly women to hold these negative views (e.g., Jacobs, 1993). In contrast, there is an extensive body of literature which indicates that elderly people tend to express their psychological problems in somatic forms (e.g., Brody, 1985) and that, as a result, they often turn to primary care physicians for relief of psychological problems that are expressed in physiological terms (e.g., Goldberg, 1992).

Taken as a whole, the literature reviewed in this section begins to provide a preliminary conceptual framework for thinking about outpatient physician use in later life. Being less adept at utilizing informal support networks, and being hindered by cognitive deficits from resolving stressors on their own, perhaps some older men turn to general medical care for assistance with their psychosocial problems. In this environment, they can express their problems in an idiom that is more acceptable to them, and receive forms of treatment that are (in their view) less stigmatizing. Stated in a more formal way, the research examined above leads to the following hypothesis: Increased exposure to stressful life events will be associated with greater use of outpatient physician services, and these effects will be especially evident among older men who are cognitively impaired.

METHODS

Sample

The population for this study consists of all household residents who are noninstitutionalized, English-speaking, 65 years of age or older, and retired (i.e., not working for pay at the time of the interview). Geographically, the study population is restricted to all eligible persons residing in the coterminous United States (i.e., people living in Alaska and Hawaii are excluded).

The sampling frame consists of all eligible individuals contained in the Health Care Finance Administration (HCFA) Medicare Beneficiary Eligibility List. This list contains the name of virtually every older adult in the United States. It is important to point out that elderly people are included in this list even if they are not currently receiving Social Security benefits. Even so, two groups of older adults may be overlooked when the HCFA list is used as a sampling frame: Excluded are elderly people who do not have a Social Security number (this may be due to factors such as illegal immigration), as well as older adults who are 100 years of age or older (HCFA does not release the names of these individuals).

A three-stage process was used to draw the sample for this study. First, 5% of the names in the master file maintained by HCFA were selected with a simple random sampling procedure. Next, 110 counties across the coterminous United States were selected from the census data and designated as primary sampling units (PSUs). These PSUs were selected with probability proportionate to the number of residents who were retired and at least 65 years of age. Following this, the HCFA list was used to select 10 eligible persons from each PSU. Some counties (e.g., Dade County, Florida) were oversampled with probability proportionate to size because they contain a disproportionately large number of eligible older adults.

The interviews were conducted by Louis Harris and Associates. Interviewing began in October 1992 and was concluded by February 1993. A total of 1,103 interviews were completed successfully. The response rate for the study was 69.1%. The average interview lasted 68.3 minutes (SD = 18.4 minutes). Additional descriptive information is provided in Table 1. In addition, this table also includes data from the 1990 U.S. Census. This makes it possible to get a preliminary sense of whether the data used in the present study are representative of all older adults in the United States.

As the data in Table 1 reveal, the information on sex, marital status, race, and level of educational attainment closely approximates the Census counts. There are, however, some slight variations by age. In particular, the study subjects are slightly older than those reported by the Census, with the differences being most evident in the youngest age range (65–69). Although it is difficult to determine the reason for this difference, it may be due to the exclusion criteria used in this study. As discussed above, people were not recruited if they were working for pay at the time of the interview. Since the U.S. Census makes no such designation, and those who are still working are younger, it follows that a disproportionately larger number of young-old people will be contained in the census data. Regardless of this

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study Data</th>
<th>1990 Census Data*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65–69</td>
<td>30.3%</td>
<td>32.4%</td>
</tr>
<tr>
<td>70–74</td>
<td>27.3</td>
<td>25.7</td>
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<tr>
<td>75+</td>
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<td>41.9</td>
</tr>
<tr>
<td>Percent male</td>
<td>40.1</td>
<td>40.2</td>
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<tr>
<td>Percent married</td>
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<td>56.0</td>
</tr>
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</tr>
<tr>
<td>Median education</td>
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</tr>
</tbody>
</table>

*1990 Census data as reported by Schick and Schick (1994).
relatively minor discrepancy, the data in Table 1 suggest that, taken as a whole, the study sample is reasonably representative of older adults in the wider population. After taking item nonresponse into account with listwise deletion of cases containing missing values, complete data were available for 1,043 cases. It should be emphasized that all estimates provided in this study are based on weighted data.

Measures

The measures used in this study are listed in Table 2. The procedures used to score these variables are contained in the footnotes of this table.

Outpatient utilization. — As shown in Table 2, information was gathered on the number of times older adults visited a physician during the past 3 months. Stays in hospital and nursing homes were explicitly excluded from this count. A 3-month recall period was selected because reporting errors may increase when longer intervals (e.g., 6 months or one year) are utilized (e.g., Mechanic, 1989). The older adults in this study reported an average of 1.716 physician visits (SD = 2.825) during the 3 months prior to the interview.

Stressful life events. — Information on stressful life events was obtained with a 49-item checklist devised by Krause (1994). Study participants were asked to identify all the events they had experienced in the year prior to the study. They were also asked to indicate whether they felt that each stressor they encountered was desirable or undesirable. The present study focuses only on self-rated undesirable events. As discussed by Krause (1994), the stressors were grouped into eight domains. This means, for example, that all events involving a spouse were presented to the study participants at the same time. An open-ended question was placed at the end of each section to determine whether the respondent had experienced any stressors that were not included in the checklist. These procedures were adapted to enhance event recall (see Krause, 1986). The participants in this study reported that they had experienced an average of 2.1 undesirable events (SD = 2.4) in the previous year.

Two issues must be discussed with respect to stress measurement: The first has to do with the recall period, and the second is concerned with events involving the respondent’s own health. There is an obvious disparity between the recall period used to assess physician visits (3 months) and the recall period used to gather information on stress (one year). Nevertheless, there are compelling reasons for focusing on life events that emerged in the past year. To begin with, research consistently shows that older adults tend to experience relatively few life events (e.g., Murren, Norris, & Grote, 1988). As the descriptive data provided above reveal, this is true of the respondents in the present study. Had a shorter recall period been used, it is likely that the variance in event exposure would have been quite small, thereby compromising meaningful data analysis. Perhaps more important, research by Pilisuk et al. (1987) provides another reason why a one-year recall period may be appropriate. Findings from their longitudinal study of adults 40 years of age and older reveal that the effects of stress on physician use are lagged, and that there may be up to a one-year period between the time an event is encountered and an outpatient visit takes place.

As research reviewed earlier suggests, it is important to control for the effects of physical health status when examining the impact of psychosocial factors on outpatient physician use. Consequently, controls for health status are included in this study (see below). However, many life event checklists explicitly ask about new illnesses experienced by the respondent. New illness episodes were, therefore, not included in the event checklist in order to avoid confounding the stress index with the physical health status measure.

Cognitive disability. — Cognitive impairment was measured with the Short Portable Mental Status Questionnaire (SPMSQ; Pfeiffer, 1975). The items in this brief 10-indicator scale measure orientation as well as recent and remote memory (for reviews of cognitive impairment measures see Albert, 1994, and Baker, 1989). In order to use the data effectively, it is important to take the distribution of responses as well as the recommended scoring strategies into consideration. Preliminary analyses reveal that the responses to the SPMSQ ranged from no incorrect answers to seven incorrect responses (M = .672; SD = 1.106). When Pfeiffer (1975) first introduced the SPMSQ, he provided cutoff scores that would allow investigators to classify their subjects as either being intact, or having mild, moderate, or severe cognitive impairment. Using these cutoff scores, none of the participants in the present study suffered from severe impairment, and only 20 had scores in the moderately impaired range. Instead, the wide majority of respondents who gave incorrect responses fell into the mildly impaired category. In recognition of this fact, and in order to deal with the highly skewed nature of the measure, SPMSQ scores were recoded into a binary format by assigning a score of 1 to study participants with three or more errors (denoting mild or moderate impairment) and a score of 0 to those with no incorrect responses. Based on this scheme, preliminary
analyses revealed that 5.7% of the study participants fit into the mild or moderately impaired category.

**Self-rated health status.** — In view of the findings produced by tests of the Behavioral Model, it is important to control for physical health status. As shown in Table 2, physical health status is measured with a brief 3-item index. A high score on this composite measure represents more perceived health problems. The internal consistency reliability estimate for this scale is .804.

A word is in order about the use of this specific health status index. Physical health status is an exceptionally broad conceptual domain (Liang, 1986). Consequently, it is important to include those health dimensions that are best suited for studying physician utilization. As Wolinsky (1994) points out, researchers working in this area should employ a wide range of health measures, including symptom scales, health ratings made by physicians, and measures of disability. Unfortunately, these types of detailed health data are not available in the present study. Nevertheless, there are important theoretical reasons why the global indicators used here may be helpful. These measures gauge subjective perceptions and evaluations of one's own health. These subjective views figure prominently in the theoretical rationale provided earlier. In particular, stress is thought to affect physician use at least in part by heightening sensitivity to, and subjective awareness of, existing symptoms that have arisen from other causes. This is just another way of reiterating a basic social psychological tenet which states that behavior is not determined by objective states per se; instead, people act on their subjective evaluations of them (Volkart, 1951).

**Demographic measures.** — Consistent with the theoretical rationale provided earlier, it is important to include a measure of sex in the analyses. In addition, it is helpful to examine the relationships among stress, cognitive impairment, sex, and physician use after the effects of age and education are controlled statistically. Age is scored in a continuous format, whereas sex is coded as a binary variable (1 = men; 0 = women). Education is a continuous measure reflecting the total number of years of schooling that were completed successfully.

There is tremendous debate in the literature on the potential confounding of education with cognitive impairment scores (e.g., Jorm, Scott, Henderson, & Kay, 1988; O'Connor, Pollit, Treasure, Brook, & Reiss, 1989). Although one way to deal with this problem is to include education as a control variable when performing multivariate analyses, the use of this strategy is also the subject of considerable disagreement (e.g., Berkman, 1986; Kittner et al., 1986). It would be impossible to resolve this issue here. Instead, the more conservative strategy is adopted, and the relationship between cognitive impairment and physician utilization is estimated after the effects of education have been taken into account.

**Data Analysis Issues**

Before turning to the substantive findings, it is important to review two data analytic issues. The first involves special concerns that arise when models that focus on cognitive impairment are evaluated with self-reported data. The second has to do with identifying the correct functional form of the relationship between stress, cognitive functioning, gender, and physician use.

As noted earlier, the SPMSQ assesses recent as well as remote memory. Since the measures of stress and physician use obviously require the ability to recall and report certain events accurately, it is necessary to determine whether the main study hypothesis can be evaluated in an unbiased manner. Although it is impossible to address this problem fully with the data at hand, a useful first step is to see whether the cognitive impairment measure is related significantly to stressful life events as well as the number of physician visits. Preliminary (but not conclusive) evidence of recall problems would be present if self-reported life events and physician visits differed significantly for older adults with cognitive deficits.

The main hypothesis that is tested in this study specifies that the impact of stress on outpatient physician use is contingent upon the respondents' gender as well as their level of cognitive functioning. Stated in more technical terms, this proposition calls for a three-way interaction between stress, gender, and cognitive functioning on physician utilization. Although there are several ways to estimate statistical interaction effects (see Busemeyer & Jones, 1983), the ordinary least squares multiple regression approach described by Aiken and West (1991) is used here. This strategy calls for the estimation of the following model:

$$OU = a + b_1SE + b_2CI + b_3SEX + b_4(SE \times CI) + b_5(SE \times SEX) + b_6(CI \times SEX) + b_7(SE \times SEX \times CI) + \beta Z,$$

(1)

In Equation 1, SE stands for stressful life events, CI represents cognitive impairment, SEX denotes gender, OU is used to designate outpatient physician use, and the Z, are the control variables that were identified earlier (i.e., age, education, and physical health status). The $b_1$ and $c_1$ are regression coefficients, and a is the intercept. Two types of multiplicative terms are included in Equation 1. The lower order (i.e., first-order) interaction terms (SE x CI; SE x SEX; and CI x SEX) are used to control for the effects of more parsimonious interactions. The three-way interaction is captured by the higher-order cross-product term that is represented by SE x SEX x CI. Following the recommendations of Aiken and West (1991), all independent variables are centered on their means (i.e., put in deviation-score form).

Equation 1 is estimated in three hierarchical steps. The additive terms as well as the control measures are added in the first step (i.e., SE, CI, SEX, and the Z). Following this, the first-order interactions are stepped into the equation. Finally, after the effects of all the other measures have been controlled statistically, the three-way multiplicative term is entered into the equation in the final step.

If the coefficient associated with the three-way interaction (i.e., $b_7$) is statistically significant, then it is helpful to perform some additional computations to make sure that the higher-order interaction is consistent with the hypothesis. Aiken and West (1991) provide the following formula that...
may be used to clarify the nature of the complex interaction effect:

\[ \text{OU} = b_1 + b_2 \text{CI} + b_3 \text{SEX} + b_4 (\text{CI} \times \text{SEX}). \]  

(2)

As before, OU stands for outpatient use, CI represents cognitive impairment, and SEX denotes gender. The regression coefficients (i.e., the \( b \)) are taken from the estimates provided in Equation 1. In essence, Equation 2 makes it possible to estimate the effects of stress on outpatient physician utilization at various combinations of sex and cognitive impairment scores. Since sex and cognitive impairment are both coded in a binary format, four separate regression estimates may be derived with this formula: The first reflects the effects of stress on physician use for men who are cognitively impaired; the second shows the impact of stress for men who do not have cognitive deficits; the third captures the effects of stress for women with cognitive impairment; and the final regression coefficient reveals the relationship between stress and outpatient medical care for women who are not experiencing problems with their cognitive functioning. Once these estimates are computed, an additional formula provided by Aiken and West (1991) (not shown here) may be used to determine whether the four regression estimates are statistically significant.

RESULTS

The findings from this study are presented in two sections. First, bivariate correlations between cognitive impairment, stress, and physician use are reviewed briefly, in order to see if the key self-reported measures in this study have been compromised by the cognitive status of the respondents. Second, the test for the three-way interaction effect is presented, and the complex nature of the relationship between stress, sex, cognitive impairment, and physician use is explored with the use of Equation 2.

Preliminary Assessment of Systematic Recall Error

Preliminary data analyses reveal that the cognitive impairment measure is not related significantly to the number of stressful life events reported by the study participants (\( r = .017 \); not significant). However, the data further indicate that older adults with at least mild levels of cognitive impairment tend to report more physician visits than elderly people who are not experiencing cognitive deficits (\( r = .094; p < .001 \)). Since memory problems may be associated with over- or underreporting of physician visits, it may initially appear as though the self-reported data used in this study are biased by recall error. Nevertheless, there are three reasons why this may not be the case. First, if recall problems are solely responsible for the relationship between cognitive impairment and physician use, then it is not at all clear why a similar relationship fails to emerge with respect to stressful events. Stated another way, we would expect memory problems to emerge across the board — not selectively. Second, the magnitude of the relationship between cognitive impairment and self-reported outpatient visits is not large. In fact, cognitive deficits fail to explain even 1% of the variance in the utilization of physician services (i.e., \( .094^2 = .009 \)). Finally, and perhaps most important, the data in the following section suggest that cognitive impairment is associated with increased physician use for some, but not all, study participants. Once again, if the relationship were solely a function of differential recall error, then greater use of outpatient services should be evident among all respondents with mild or moderate levels of cognitive impairment.

Stress, Cognitive Impairment, Sex, and Physician Use

The results obtained from the hierarchical test of Equation 1 are presented in Table 3. The data in each column contain the coefficients that were derived at each of the three steps in this estimation process.

Estimates of the simple additive effects (see the first column of Table 3) are consistent with previous research. For example, self-rated health exerts a fairly strong impact on reported physician use: Older adults with more perceived health problems tend to have significantly more outpatient visits (Beta = .317; \( p < .001 \)). Similarly, as discussed above, older adults with either mild or moderate levels of cognitive impairment report seeing a physician more often than elderly people who do not experience cognitive deficits (Beta = .080; \( p < .05 \)). Finally, although sex and stress are also related to outpatient physician use, the impact of these variables is not substantial. More specifically, the data in Table 3 suggest that older men report having made slightly more physician visits than elderly women (Beta = .063; \( p < .05 \)). In addition, as exposure to undesirable events increases, older adults have a slight tendency to make more outpatient visits (Beta = .067; \( p < .05 \)).

Table 3. Stress, Cognitive Impairment, Gender, and Outpatient Physician Use (\( N = 1,043 \))

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Additive Effects</th>
<th>First-Order Interactions</th>
<th>Higher-Order Interaction</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td>-.050* (-.021)</td>
<td>-.053 (-.022)</td>
<td>-.048 (-.020)</td>
</tr>
<tr>
<td>Education</td>
<td>.053 (.044)</td>
<td>.056 (.045)</td>
<td>.056 (.046)</td>
</tr>
<tr>
<td>Self-rated health</td>
<td>.317*** (.439)</td>
<td>.316*** (.437)</td>
<td>.310*** (.429)</td>
</tr>
<tr>
<td>Sex</td>
<td>.063* (.362)</td>
<td>.065* (.405)</td>
<td>.065* (.376)</td>
</tr>
<tr>
<td>Stress</td>
<td>.067* (.078)</td>
<td>.083** (.097)</td>
<td>.079** (.092)</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>.080** (.979)</td>
<td>.062* (.769)</td>
<td>.092** (1.129)</td>
</tr>
<tr>
<td>(Impairment × Stress)</td>
<td></td>
<td>.107*** (.494)</td>
<td>.148*** (.683)</td>
</tr>
<tr>
<td>(Impairment × Sex)</td>
<td></td>
<td>.117*** (2.856)</td>
<td>.120*** (2.928)</td>
</tr>
<tr>
<td>(Sex × Stress)</td>
<td></td>
<td>.079** (.201)</td>
<td>.067* (.170)</td>
</tr>
<tr>
<td>(Sex × Stress × Impairment)</td>
<td></td>
<td>.202*** (1.970)</td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.123</td>
<td>.151</td>
<td>.189</td>
</tr>
</tbody>
</table>

*Standardized regression coefficient (Beta).

*p < .05; **p < .01; ***p < .001.
Up to this point, the findings largely reflect what is already reported in the literature: Physical health status measures tend to explain virtually all of the variance in outpatient physician visits. However, as the data in Column 3 reveal, the three-way interaction between sex, stress, and cognitive impairment on physician use is highly significant (\( b = 1.970; p < .001 \)). Metric coefficients are discussed when the three-way interaction is first reviewed because standardized estimates are not inherently meaningful in this context (see Aiken & West, 1991, for a detailed discussion of this issue). Stated in more technical terms, this finding suggests the modest effects described above may be attributed to the fact that the relationships in the model are not specified correctly and that more complex higher-order models are needed to accurately capture the impact of sex, stress, and cognitive functioning on the use of outpatient physician services.

Even though a three-way interaction has been observed in the data, it is hard to tell from the information in Column 3 if the interaction is in the hypothesized direction. Fortunately, as discussed earlier, the estimates derived from Equation 2 can help to pinpoint the precise nature of these complex effects. The estimates derived with Equation 2 are presented in Table 4. An emphasis is placed here on unstandardized regression coefficients because the natural metric is meaningful. In particular, these coefficients reflect the increase in the number of physician visits that are associated with an increase of one undesirable life event.

Consistent with the main study hypothesis, the data in Table 4 suggest that each negative life event is associated with an increase of about two outpatient physician visits for older men who have either mild or moderate levels of cognitive impairment (\( b = 1.940; p < .001 \)). In contrast, stressful events fail to influence physician use among elderly men who are not suffering from cognitive deficits (\( b = .087; \) not significant). The same appears to be true for older women. In particular, exposure to stress does not lead to greater physician use among women who are not cognitively impaired (\( b = .029; \) not significant). Perhaps more important, stress does not appear to trigger increased outpatient use even among older women who are experiencing problems with cognitive functioning (\( b = -.088; \) not significant).

Focusing on the proportion of variance explained by the model serves to highlight the importance of working with higher-order terms. As shown at the bottom of Table 3, approximately 12.3% of the variance is explained in physician visits when only additive effects are examined. However, when the relationships among the psychosocial predictors are specified correctly with more complex multiplicative terms, the proportion of explained variance increases by about 54% to an \( R^2 \) value of .189. It is interesting to note that the variance explained by the higher-order model tested here is comparable to that of longitudinal studies that contain baseline measures of physician use as predictors (see, for example, Counte & Glandon, 1991).

**DISCUSSION**

As Pescosolido (1992) demonstrates convincingly, the decision to seek medical care is an immensely complex process that involves the interplay between a number of psychosocial factors. In recognition of the intricate nature of this process, the intent of this study has been to probe the higher-order relationship between stressful events, cognitive functioning, sex, and outpatient physician use. Although this is by no means the first study to approach health care use from a stress perspective, the emphasis on cognitive functioning tends to pull the focus to problems that are especially relevant for our aging population. This appears to be the first time that cognitive impairment has been cast within a stress and coping response context. This approach seems warranted, given the prevalence of cognitive deficits in later life, as well as the central role played by cognitive facilities in many coping strategies. Nevertheless, it should be reemphasized that this study focused on mild, not severe, cognitive impairment. As a result, it is not clear whether the observed findings would generalize to those elders with severe cognitive impairment. However, it seems unlikely that this would be the case.

The findings suggest that older men with mild levels of cognitive impairment may be especially likely to use general medical services when undesirable events arise. These results appear to be congruent with what is known about gender differences in the help-seeking process. While many elderly men may prefer to resolve their problems on their own, cognitive deficits may impede their ability to do so. Being disinclined to turn to informal others for assistance with psychosocial problems, they may seek help in a formal medical setting as a palatable option.

Although a number of investigators suggest that women are more likely to use primary medical care than men (e.g., Haug, 1981), other researchers have been unable to find significant gender differences in outpatient service use (e.g., Benson & Marano, 1994; Mutran & Ferraro, 1988). However, the reasons for these potentially important age-leveling effects have not been spelled out clearly. The perspective developed in the present study may provide a useful point of departure for formulating a credible explanation for this important shift in health care utilization.

Perhaps more important, the results presented above may have some practical applications, as well. While researchers suspect that stress may be associated with increased physician use, it is also evident that the majority of older adults do not seek general medical care whenever they are confronted with a noxious event. The inability to specify when help-seeking will take place makes it difficult to identify a manageable target group for the purpose of developing effective intervention strategies. By singling out older men with mild cognitive impairment, a potentially useful first step may be taken to resolve this problem.

Before presenting recommendations for the design of specific interventions, it is important to replicate the findings

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**Table 4. Simple Slopes for the Three-Way Interaction Between Stress, Gender, and Cognitive Impairment on Physician Use**

| Effect of Stress on Physician Use for: |  |  |
|--------------------------------------|-------------------|
| Men with mild impairment              | 1.940***          |
| Intact men                            | .087              |
| Women with mild impairment            | -.088             |
| Intact women                          | .029              |

*Metric (unstandardized) regression coefficient.***\( p < .001 \).
that have been reported here. Those wishing to pursue this agenda would be well advised to take several of the limitations in this work into consideration. Three are discussed briefly below: First, the data are cross-sectional; second, a number of key constructs were identified but not measured; and third, more focused measures of life events may provide even greater insights.

The data in this study were gathered at one point in time. Consequently, it is likely that the estimates presented earlier are not precise. These estimation problems arise for several reasons. For example, critically important dynamic aspects of the interface between stress and outpatient medical visits could not be addressed. More specifically, it was not possible to determine how much time elapses between exposure to an event and a subsequent outpatient visit. Nevertheless, these kinds of data are crucial for correctly specifying the relationship between these constructs. Carefully crafted questions administered at more than one point in time are needed to overcome this limitation.

In the process of developing the theoretical rationale for this study, a number of constructs were invoked, including informal social support as well as the predisposition of older men to work out their difficulties on their own. Even so, these potentially important intervening mechanisms were not measured directly. The utility of the model developed in this study obviously hinges on direct tests of these key intervening links.

The stress measure that was used here represents a simple summary score reflecting exposure to all undesirable events taken together. However, recent advances in stress measurement indicate that greater insights may be obtained if these global measures are disaggregated into theoretically meaningful subsets or categories of specific life event types (e.g., Krause, 1994). There were two reasons why this strategy was not followed in the present study. First, following the principle of parsimony, a decision was made to go with the least complex measurement strategy in order to determine whether stress is generally associated with cognitive functioning and physician use. Having presented some evidence that this may be the case, the next step involves honing this measurement approach in order to see whether certain types of stressors are primarily responsible for this effect. Second, the theoretical framework introduced above is, of necessity, complex. As a result, a simple stress measurement strategy was employed in an effort to keep the focus on the potentially important role of cognitive functioning.

Measures of cognitive impairment are rarely used as independent variables in research on the stress process. This is understandable, given the concerns that arise about the accuracy of self-reported life event exposure among those with cognitive deficits. However, if random sampling in large-scale community surveys is done properly, studies will continue to include some older adults with at least mild levels of cognitive impairment. Consequently, many investigators are already working with older adults who have cognitive deficits, even though they do not explicitly acknowledge this important subgroup. At the broadest level, the goal of the present study has been to recognize this fact, and attempt to model cognitive functioning explicitly in order to see if it is related to other measures in a theoretically meaningful manner. The results presented here suggest that this may be the case. Perhaps these findings will motivate others to continue to expand our understanding of how this important concomitant of aging influences the daily lives and health care decisions of many older adults.

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