Physical Health, Self-Reliance, and Emotional Control as Moderators of the Relationship between Locus of Control and Mental Health among Men Treated for Prostate Cancer

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This investigation examined the moderating effects of physical health and scripts for masculinity (i.e., self-reliance and emotional control) on the relationship between powerful other people locus of control and mental health for 230 men treated for prostate cancer. Regression analyses indicated that physical health and masculine gender scripts moderated the association between powerful other people locus of control and mental health. Specifically, men with poor physical health evinced negative mental health when they endorsed masculine gender scripts and believed powerful other people (i.e., family, friends, or peers) were influential in controlling their cancer. By comparison, men reporting poor physical health, strong beliefs that powerful other people controlled their cancer, and less adherence to masculine scripts experienced positive mental health. The authors discuss future research directions and potential mental health implications for men treated for prostate cancer.

KEY WORDS: health locus of control; gender scripts; masculinity; mental health; prostate cancer; quality of life.

Among the leading causes of death for men in the United States, prostate cancer is the most prevalent solid tumor malignancy (American Cancer Society, 2005b). Indeed, prostate cancer is the second leading cause of death from cancer for men in the United States (American Cancer Society, 2005a). In 2006, the American Cancer Society estimates that 234,460 American men will be diagnosed with prostate cancer, resulting in 27,350 deaths (American Cancer Society, 2006).

A variety of treatment options are available to men with prostate cancer. When the cancer is of a low grade or localized to the prostate gland, treatment involves surgery or radiation (American Cancer Society, 2005c). For men with metastatic disease (cancer that has spread into outlying areas of the body), chemotherapy and hormone therapies are utilized to limit further metastases (American Cancer Society, 2005c). Currently, there is no medical or scientific consensus as to which therapeutic option best enhances the survival rate of men with prostate cancer (Eton and Lepore, 2002). Unfortunately, each treatment has its own side-effects and complications, each of which adversely affects physical health (Lintz *et al.*, 2003). For instance, common therapies for prostate cancer may induce: hot flashes, erectile difficulties, loss of muscle mass, fatigue, bowel incontinence, rectal discomfort, diarrhea, urinary urgency, breast enlargement, osteoporosis, and liver dysfunction (American Cancer Society, 2005b).

As a consequence of poor physical health stemming from these treatment-induced side effects, men with prostate cancer often experience significant mental health concerns (Eton and Lepore, 2002). Indeed, distress, anxiety, and depression are commonly reported by men with prostate cancer as they cope with the illness and its treatments (Llorente *et al.*, 2005). Unfortunately, relatively little is known about factors that promote or impede men's adjustment following treatment for prostate cancer (Eton and Lepore, 2002).

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One factor that may affect the mental health of men with prostate cancer is their beliefs about the ability of non-medical personnel such as family, friends, and peers to aid them in combating and controlling the progression of their cancer (Wallston et al., 1994). As men frequently report distant and adversarial relationships and infrequent contact with their physicians (Powel and Clark, 2005), beliefs in the capacity of family, friends, and peers to control prostate cancer may reflect an important component of men's recovery following treatment for the disease. In support of this contention, research by Roberts et al. (2006) found that men treated for prostate cancer believe their wives are a significant asset in managing their illness. Similarly, Willener and Hantikainen (2005) demonstrated that men with prostate cancer also view supportive relations with friends as a central means of maintaining positive health. In other research, Gray and colleagues (1997) indicated that men with prostate cancer rely on peeroriented support groups to cope with physical and emotional difficulties.

Men's beliefsabout the capacity of family, friends, and peers to aid them in combating and controlling their illness is a type of health control belief referred to as powerful other people health locus of control (Wallston et al., 1994). Though not previously examined in relation to mental health among men treated for prostate cancer, a significant body of research highlights the role of powerful others beliefs in predicting the psychological adjustment of patients with a variety of other illnesses. For epilepsy (Dunn et al., 1999), heart disease (Kugler et al., 1994), HIV/AIDS (Burns et al., 2005), and cancer (Swinney, 2002), belief in powerful others' influence on the progression of illness plays a central role in patients' adjustment. However, beliefs in powerful others' influence on disease are not associated with uniformly consistent outcomes. Indeed, while some investigations indicate that strong powerful others control beliefs yield positive adjustment to illness (e.g., Burns et al., 2005; Taylor et al., 1984), other studies suggests beliefs in powerful others' predict poor adjustment (Frank and Elliott, 1989; Wallston et al., 1994). Still other research suggests no relationship exists between beliefs in powerful others' control of illness and psychological adjustment (e.g., Watson et al., 1990).

One possible explanation for these contradictory findings is the failure to consider contextual, moderating factors such as physical health (Folkman, 1984). Indeed, in an investigation by Andrykowski and Brady (1994) physical health status moderated the relationship between powerful others health locus of control and distress. In that study, beliefs that powerful others were able to control the progression of cancer were associated with less distress for patients with better physical health. By contrast, individuals with poor health who strongly believed in powerful others' control of cancer demonstrated significantly greater distress. According to Folkman (1984), these mismatches between patients' beliefs in powerful other people's impact on cancer and the objective reality of poor physical health may precipitate poor mental health. For example, when a man who strongly believes family, friends, or peers can control his prostate cancer experiences poor physical health, his beliefs in powerful other people's capacity to influence the progression of his illness may be undermined. This objective inability of powerful other people (i.e., family, friends, or peers) to combat and control the illness may, in turn, precipitate poor mental health (Folkman, 1984).

The interaction of these variables may be further moderated by men's adherence to dominant culture masculine scripts (e.g., self-reliance and emotional control) (Helgeson and Lepore, 1997). Masculine scripts refer to socially constructed ideals of masculinity that constitute socially accepted ways for boys and men to think, feel, and behave (Mahalik et al., 2003a). For many men, autonomously coping with problems and remaining emotionally controlled represent central masculine ideals (Mahalik et al., 2003b). Adherence to these ideals, however, may precipitate poor mental health among men with prostate cancer as the illness becomes progressively severe (Burns and Mahalik, in press) and increasingly uncontrollable (Helgeson and Lepore, 2004).

To illustrate, when a man who believes family, friends, or peers are important in controlling prostate cancer experiences poor health, his beliefs in powerful other people's control are likely to be undermined (Folkman, 1984). For men who adhere to masculine scripts for self-reliance, this interaction may be magnified as these men are unlikely to rely on others to cope with their poor health, despite their beliefs powerful other people are influential in controlling the illness. This unwillingness to rely on family, friends, or peers (i.e., powerful other people) may leave men alone to cope with their poor health (Helgeson and Lepore, 2004). In essence, beliefs that powerful other people are an important asset in controlling and combating prostate cancer may only be beneficial to extent that men are willing to rely on these sources of support.

Moderators of Mental Health

A similar interaction effect may occur among men who adhere to scripts for emotional control. Research suggests that men with prostate cancer experience a variety of powerful emotions as their health declines (Pirl et al., 2002). For an emotionally controlled man, feelings associated with such declines are likely to be unexplored, a behavior that may diminish mental health (Burns and Mahalik, in press; Helgeson and Lepore, 2004). For these emotionally controlled men, the inability of powerful other people to control health, coupled with their unwillingness to discuss their feelings with these individuals, may foster poor mental health. Again, believing that powerful other people are important in controlling and combating prostate cancer may be adaptive only to the extent that men are willing to employ these individuals as a source of emotional support.

In the present investigation we test these hypotheses by examining the influence of men's physical health and their adherence to scripts for selfreliance and emotional control on the relationship between powerful other people locus of control and mental health. We hypothesized that physical health and self-reliance would moderate the relationship between powerful other people locus of control and mental health. Specifically, we predicted that men treated for prostate cancer who believed that powerful other people (i.e., family, friends, and peers) influenced their health outcomes would report poor mental health when they had poor physical health and were self-reliant. Conversely, we anticipated that men who believed that powerful other people influenced their health outcomes would report positive mental health when they demonstrated poor physical health but low self-reliance. Second, we hypothesized that physical health and emotional control would moderate the relationship between powerful other people locus of control and mental health. For this hypothesis we expected that emotionally controlled men who believed powerful other people influenced their health outcomes would report negative mental health when they had poor physical health. By contrast, we predicted that men who believed powerful other people influenced their health outcomes would report good mental health when they had poor physical health but were less emotionally controlled.

METHOD

Participants

Research participantswere recruited through two sources. The first was a support group for men with various stages of prostate cancer held at a large public hospital in New England. Prostate cancer listservs served as the second source. Respondents in the support group were invited to complete the survey on announcements placed in the group's meeting room, while men on the listserv were recruited through an e-mail request sent to each listserv. Participation was anonymous via a web-based survey hosted by PsychData.com. Upon logging on to the study's URL, participants were directed to the informed consent document. Participants were then directed to the demographic items sheet. Upon finishing this page, participants completed (a) a powerful other people health locus of control questionnaire, (b) a scale assessing mental health, (c) a measure of physical health, (d) a scale assessing self-reliance, and (e) a questionnaire measuring emotional control.

Three hundred and fifty-three men responded to requests for participants and logged onto the study URL. Of these 353 men, 123 were not included in final data analyses as they were residents of countries other than the United States (n=23), they had not been treated for prostate cancer (n=8), or they left entire measures, or more than 10% of any given measure, unanswered (n=92). Demographic characteristics of the sample are summarized in Table I.

Instrumentation

Powerful Other People Health Locus of Control scale

The authors administered the Powerful Other People Health Locus of Control scale to assess participants' beliefs that family, friends, or peers are an important asset in controlling the progression of prostate cancer (Wallston et al., 1994). This scale represents a disease-specific adaptation of Wallston and colleagues' (1978) original Powerful Others Health Locus of Control measure. According to Wallston and associates (1994), the Powerful Other People Health Locus of Control scale reflects sensitivity to the fact that patients may hold different beliefs about powerful others' influence on their general health than they hold about powerful others' impact on a specific illness. Similarly, whereas Wallston and colleagues (1978) original Powerful Others measure assessed beliefs about medical personnel's control of illness, the Powerful Other People Locus of Control scale explores beliefs about the impact of family, friends, and peers on disease (Wallston et al., 1994). The Powerful Other People scale consists of three

Table I. Demographic and Clinical Characteristics

Characteristic ($n = 230$)		
Age		
M		62.49
SD		8 69
Time since diagnosis (in months)		0.09
M		18 36
SD		40.50
SD Time since treatment (in months)		41.05
I line since treatment (in months)		27.10
		27.10
SD		32.15
Most recent PSA		
M		16.29
SD		189.92
Most recent treatment type*	No	0/_
Most recent treatment type		/0
Radical prostatectomy	83	36
Cryosurgery	11	5
External beam radiation	55	24
Drachuthoropy	40	24
L staining harmon a	49	21
Luternizing normone	42	18
Anti-androgens	44	19
da Vinci robotic prostatectomy	14	6
Other treatment type	43	19
Location of cancer		
Localized	172	75
Metastasized/Advanced	58	25
Relational status		
Married/with partner	201	87
Single	5	2
Divorced/separated	24	11
I		
Ethnic background	No.	%
11/1 / AT TT '		
white/Non-Hispanic	212	92
Hispanic/Latino	5	2
African American	6	3
Other unidentified ethnicity	7	3
Sexual orientation		
Heterosexual	208	90
Homosexual/Gay	11	5
Bisexual	9	4
Transgender	2	1
Education		
High School Graduate/GED or less	9	4
Some post-secondary education	53	23
Bachelor's degree	72	31
Master's degree	54	23
Low degree	8	4
Destarel degree	26	4
Doctoral degree	20	11
Missing	0	4
Employment status	No.	%
Work full-time	98	43
Part-time	20	9
Disabled	20 A	2
Detired	107	∠ 17
Inomployed/unable to find work	107	+/ 5
Unemployed/unable to find work	1	3

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Table I. Co	ntinued	
Characteristic ($n = 230$)		
Annual household income	No.	%
Less than \$39,999	37	17
\$40,000 to \$59,999	38	17
\$60,000 to \$79,999	48	21
\$80,000 to \$99,999	31	14
\$100,000 to \$124,000	28	12
Over \$125,000	42	19
Missing	6	3

Note. Several participants reported receipt of more than one treatment type. Treatments elected by fewer than five percent of sample participants were categorized as "Other Treatment Type."

items and yields scores ranging from three to 18, with higher scores representing the participant's belief that powerful other people (i.e., family, friends, or peers) are influential in controlling the progression of prostate cancer. Items from the measure include, "The type of help I receive from other people determines how soon my prostate cancer improves," "Other people play a big role in whether my prostate cancer improves, stays the same, or gets worse," and "In order for my prostate cancer to improve, it is up to other people to see that the right things happen." For all Powerful Other People items, a six-point Likerttype format is utilized, with anchor points ranging from Strongly Agree to Strongly Disagree. Research by Wallston et al. (1994) demonstrated Powerful Other People scores are significantly associated with depression, ratings of pain, and helplessness among people living with chronic pain and arthritis. Internal consistency reliability for the Powerful Other People scale reported by Wallston et al. (1994) was 0.71, while test-rest reliability ranged from 0.35 to 0.54. The Cronbach's alpha coefficient for the scale in the current study was 0.66, and scores ranged from a low of three to a high of 18 (M = 8.65 and SD = 3.09).

SF-36 Quality of Life Survey

Physical Health Quality of Life Summary Scale. The Physical Health Quality of Life Summary scale is a 25-item questionnaire that assesses five domains of physical health: physical functioning, role limitations associated with physical debilitations, energy/vitality, pain, and general health perception items (Ware and Kosinski, 2001). For each dimension of health functioning, items are scored and coded, summarized, scaled from zero (low health functioning) to 100 (excellent health) and aggregated into a composite Physical Health Quality of Life score (Ware and Kosinski, 2001). Items on the scale employ two, three, and six point response formats, with anchor points ranging from Yes to No; Yes, limited a lot to No, not limited at all; and Not at All to Extremely. According to Ware and Kosinski (2001), Physical Health Quality of Life scores at or below 50 are suggestive of substantial physical impairment; limitations in self-care, physical, social, and role activities; severe pain; and frequent tiredness. Physical Health Summary scores are associated in logically consistent directions with relevant domains from the Functional Assessment of Cancer Therapy Prostate module and the American Urological Association Symptom Index (Wei et al., 2000). Internal consistency estimates reported by Ware and Kosinski (2001) ranged from 0.89 to 0.94 for the Physical Health Summary scale. In the present study, the Cronbach's alpha coefficient for the scale was 0.92, while scores ranged from a low of 23.04 to a high of 68.89 (M = 52.24 and SD = 8.63).

Mental Health. Each participant's mental health was ascertained through the mental health subscale of the SF-36 Quality of Life survey (Ware et al., 1993). Questions on the five-item mental health subscale employ six point response formats, with anchors ranging from All of the Time to None of the Time. Items on the mental health subscale are scored and coded, summarized, and scaled from zero to 100 (Ware et al., 1993). Mental health scores at or below 50 represent clinically significant affective impairment (Ware et al., 1993). Research by Ware et al. (1993) demonstrated that the mental health scale is associated with scores on the Quality of Well-Being Scale, Mental Health Dimension of the Duke Health Profile, and relevant subscales of the Sickness Impact Profile. Internal consistency reported by Ware and Kosinski (2001) was 0.90 for the mental health scale. In the investigation the Cronbach's alpha coefficient for the scale was 0.88, with scores ranging from 23.18 to 64.07 (M = 51.77 and SD = 9.34).

Conformity to Masculinity Norms Inventory

The Conformity to Masculinity Norms Inventory (CMNI) is a 94-item questionnaire that assesses men's adherence to an array of dominant culture scripts of masculinity in the United States. For all CMNI test items, a four-point (0 to 3) response format is employed with anchor points ranging from *Strongly Disagree* to *Strongly Agree*. Ac-

cording to Mahalik et al. (2003b), the CMNI yields eleven factor-validated norms (Winning, Emotional Control, Risk-Taking, Violence, Dominance, Playboy, Self-Reliance, Primacy of Work, Power over Women, Disdain for Homosexuals, and Pursuit of Status) and a total, composite score. In the present study only the Self-Reliance and Emotional Control scales were employed. Though these dimensions likely share some degree of variance in that they reflect norms traditionally associated with masculinity in the United States, Mahalik et al. (2003b) demonstrated the statistical orthogonality of these two factors. Sample items for the six-item self-reliance scale include, "It bothers me when I have to ask for help," and "I am not ashamed to ask for help." Items from the eleven-item Emotional Control scale include, "I prefer to stay unemotional" and "It is best to keep your emotions hidden." Previous research suggests that CMNI self-reliance scores are significantly related to emotional inexpressiveness, psychological distress, aggression, and hesitancy to seek psychological help (Mahalik et al., 2003b). Emotional control scores are significantly associated with social dominance, aggression, restricted affection between men, concealing emotions, and negative attitudes toward seeking psychological help (Mahalik et al., 2003b). Each scale has found to be a reliable correlate of the health, health-related behaviors, and psychological adjustment of populations of men from a variety of socio-demographic backgrounds (e.g., Kimmel and Mahalik, 2005; Mahalik et al., in press, 2003b). Threeweek test-retest analyses by Mahalik and associates (2003b) demonstrated the temporal stability of selfreliance (r = 0.80) and emotional control (r = 0.90). Internal consistency reported by Mahalik and associates (2003b) for the self-reliance scale was 0.85. Internal consistency for the emotional control scale was 0.91 (Mahalik et al., 2003b). The Cronbach's alpha coefficient for the Self-Reliance scale in the current research was 0.74 and 0.89 for the Emotional Control scale. Scores on the Self-Reliance scale ranged from a low of 0 to a high of 13 (M = 5.60 and SD = 2.64), while scores on the Emotional Control scale ranged from 1 to 28 (M = 15.06; SD = 4.75).

RESULTS

Analysis Overview

To explore the moderating effects of physical health and either self-reliance or emotional control on the relationship between powerful other people

Table II. Means, Standard Deviations, and Correlations between Study Variables

Factor	Means	S.D		1	2	3	4	5
1. Mental health	51.77	9.34	Pearson correlation Significance (2-tailed) Number	_				
2. Powerful other people locus of control	8.65	3.09	Pearson correlation Significance (2-tailed) Number	0.042 0.522 230	_			
3. Physical health	51.81	8.72	Pearson correlation Significance (2-tailed) Number	0.043 0.514 230	- 0.156* 0.018 230	—		
4. Self-reliance	5.60	2.64	Pearson correlation Significance (2-tailed) Number	-0.251^{**} 0.000 230	- 0.083 0.212 230	0.041 0.538 230	_	
5. Emotional control	15.06	4.75	Pearson correlation Significance (2-tailed) Number	-0.130* 0.049 230	-0.057 0.388 230	0.145* 0.027 230	0.652** 0.000 230	230

p < 0.05; p < 0.01.

locus of control and mental health, the authors conducted two separate hierarchical regression analyses. According to Frazier *et al.* (2004), "a moderator is a variable that alters the direction or strength of the relation between a predictor and an outcome. Thus, a moderator effect is nothing more than an interaction whereby the effect of one variable depends on the level of another" (p. 116). When both the predictor and moderating variables are continuous (e.g., health locus of control, physical health quality of life), Frazier *et al.* (2004) recommend testing the moderating relationship through hierarchical multiple regression.

In each regression, mental health served as the criterion variable, while powerful other people locus of control, physical health, and either self-reliance or emotional control were the main effects. To test moderation, product terms for the two-way interactions and the three-way interaction term served as predictor variables. As age (r[230] = 0.24; p < 0.001)and time since diagnosis (r[230] = 0.17; p < 0.008)were the only two socio-demographic variables significantly associated with mental health, these variables were entered in the first step of each analysis to control their potential effects on mental health. In the second step, the three predictor variables were entered to examine their main effects. In the third step, the investigators entered all two-way interaction terms. In the fourth, the authors entered threeway product terms (powerful other people x physical health x self-reliance or powerful other people x physical health x emotional control). All predictor variables were standardized prior to their entry in the regression equation to reduce multi-collinearity (Frazier et al., 2004).

Of the variety of ptions for addressing missing values for the variables and covariables under study (e.g., listwise deletion, regression imputation), an unconditional mean substitution strategy was employed. Moreover, as time since diagnosis and physical health were moderately skewed, the authors computed square root transformations for these variables. See Table II for the means, standard deviations, and inter-correlations of study variables.

Powerful Other People Locus of Control × *Physical Health* × *Self-Reliance*

In step one of the regression of mental health on powerful other people locus of control, physical health, and self-reliance, age and time since diagnosis accounted for a significant 6.3% of the variance in mental health scores, F(2,227) = 7.63, p < 0.001. The regression weights from the full nine-variable model demonstrated that greater age (B = 2.16, t = 3.26, p < 0.001) predicted better mental health. In step two, the main effects for powerful other people, physical health, and self-reliance explained an additional 6.8% increment of variance in mental health, F(3,224) = 5.84, p < 0.001. In this step, self-reliance predicted mental health (B = -1.97, t = -3.31, p < 0.001), with higher self-reliance associated with poorer mental health.

In the third step, the two-way interaction terms accounted for a non-significant 2.8% increment, F(3,221) = 2.46, p > 0.06. In this step, the two-way interaction between powerful other people and self-reliance was predictive of mental health, B = -1.25, t = -2.02, p < 0.05. Finally, addition of the

Health, and Self-Reliance					
Variable	ΔR^2	t	B^a	р	VIF
Step 1	0.06				
Âge***		3.26	2.16	0.001	1.34
Time since diagnosis		1.31	0.84	0.19	1.27
Step 2	0.07				
Powerful other people locus of control		0.64	0.37	0.53	1.05
Physical health		1.76	1.08	0.08	1.17
Self-reliance***		-3.31	-1.97	0.001	1.09
Step 3	0.03				
Powerful other people × Physical health		0.97	0.50	0.33	1.04
Powerful other people × Self-reliance*		-2.02	-1.25	0.05	1.10
Self-reliance × Physical health		-0.41	-0.23	0.68	1.15
Step 4	.02				

-2.54

-1.35

0.01

1.13

 Table III.
 Regression of Mental Health on Powerful Other People Locus of Control, Physical Health, and Self-Reliance

^{*a*}*B* from full nine-variable model.

*Significant predictor of Mental Health at 0.05.

Powerful others × Physical Health × Self-Reliance**

**Significant predictor at 0.01.

*** Significant predictor at 0.001.

three-way product term (powerful other people × physical health × self-reliance) explained a significant 2.4% of the variance in mental health, F(1,220) = 6.44, B = -1.35, t = -2.54, p < 0.01. The full nine-variable model accounted for 18.3% of the variance in mental health scores. See Table III for a depiction of these results.

As recommended by Frazier et al. (2004), interpretation of the significant three-way interaction was achieved by plotting the unstandardized predicted values for mental health against powerful other people locus of control for participants scoring one standard deviation above and one below the sample self-reliance and physical health means. Consistent with prediction, men with poor physical health evinced poor mental health when they strongly endorsed the masculine norm of self-reliance and believed powerful other people (i.e., family, friends, and peers) were important in controlling and combating prostate cancer (Group A). Also as anticipated, men who reported poor physical health and strong powerful other people beliefs evinced positive mental health when they demonstrated low selfreliance (Group B). This interactive pattern was most apparent among men with low physical health scores (see Fig. 1).

Powerful Other People Locus of Control × *Physical Health* × *Emotional Control*

In step one of the regression of mental health on powerful other people locus of control, physical health, and emotional control, age and time since diagnosis again accounted for a significant 6.3% of the variance in mental health, F(2,227) = 7.63, p < 0.001. The nine-variable model regression weights indicated that greater age (B = 2.20, t = 3.20, p < 0.002) was associated with better mental health. In step two, the main effects for powerful other people, physical health, and emotional control explained a significant 3.5% of variance in mental health, F(3,224) = 2.91, p < 0.04. The regression weights from the nine-variable model indicated that better physical health, B = 1.26, t = 1.94, p < 0.05, and less emotional control were associated with better mental health, B = -1.26, t = -2.00, p < 0.05.

In step three, the two-way interactions accounted for a non-significant 2.3%, F(3,221) = 1.94, p > 0.13. Finally, in the fourth step the three-way interaction explained an additional 2.0% of variance in mental health scores, F(1,220) = 5.04, B = -1.19, t = -2.25, p < 0.03. The full nine-variable model accounted for 14.1% of the variance in mental health. See Table IV.

Again, interpretation of the significant threeway interaction was achieved by plotting the unstandardized predicted values for mental health against powerful other people for participants scoring one standard deviation above and one below the sample emotional control and physical health means. As anticipated, men reporting poor physical health evinced poor mental health when they strongly endorsed the masculine norm of emotional control and believed powerful other people (i.e., family, friends, and peers) were important in controlling and



Fig. 1. Regression of health, self-reliance, and powerful others. Note. High and Low refer to scores one S.D. above and below the sample mean respectively. Group A: Low Physical Health, Low Self-Reliance (n = 5). Group B: Low Physical Health, High Self-Reliance (n = 6). Group C: High Physical Health, Low Self-Reliance (n = 5). Group D: High Physical Health, High Self-Reliance (n = 7).

combating the progression of prostate cancer (see Group A). Also as hypothesized, men who reported poor physical health and strong powerful other people beliefs experienced positive mental health when they demonstrated a greater willingness to discuss emotion (Group B). This interactional pattern was most evident among men with poor physical health (see Fig. 2).

DISCUSSION

Several investigations suggest family, friends, and peers are an important resource for men with prostate cancer as they recover from treatment and cope with the disease (e.g., Roberts *et al.*, 2006; Willener and Hantikainen, 2005). Consistent with these findings, in the current study men with poor

Variable	ΔR^2	t	B^{a}	р	VIF			
Step 1	0.06							
Age**		3.20	2.20	0.002	1.38			
Time since diagnosis		1.76	1.15	0.08	1.27			
Step 2	0.04							
Powerful other people locus of control		0.59	0.36	0.56	1.06			
Physical health*		1.94	1.26	0.05	1.23			
Emotional control*		-2.00	-1.26	0.05	1.14			
Step 3	0.02							
Powerful other people × physical health		0.32	0.17	0.75	1.07			
Powerful other people × emotional control		-1.70	-1.08	0.09	1.19			
Emotional control x physical health		-0.38	-0.22	0.70	1.14			
Step 4	0.02							
Powerful others \times health \times emotional control*		-2.45	-1.19	0.03	1.15			

 Table IV.
 Regression of Mental Health on Powerful Other People Locus of Control, Physical Health, and Emotional Control

^{*a*}*B* from full nine-variable model.

*Significant predictor of Mental Health at 0.05.

**Significant predictor at 0.01.



Fig. 2. Regression of health, emotional control, and powerful others. Note: High and Low refer to scores one S.D. above and below the sample mean respectively. Group A: Low Physical Health, Low Emotional Control (n=8). Group B: Low Physical Health, High Emotional Control (n=5). Group C: High Physical Health, Low Emotional Control (n=7). Group D: High Physical Health, High Emotional Control (n=7).

physical health evinced poor mental health when they were self-reliant and strongly believed family, friends, or peers were an important asset in controlling and combating their illness. For these men, the inability of powerful other people to control cancer, and their efforts to cope independently, appear to have interacted with poor physical health to precipitate negative mental health. Although further research on this association is needed, this finding may suggest that beliefs in the importance of family, friends, or peers in combating and controlling prostate cancer are adaptive only to the extent that men are willing to rely on these individuals. By comparison, men reporting poor health, strong powerful other people beliefs, and low self-reliance demonstrated positive mental health. These respondents' willingness to rely on others, coupled with their beliefs that family, friends, or peers control cancer, appears to have fostered positive mental health despite their poor physical health. Finally, for men demonstrating weaker powerful others control beliefs, the interaction of these variables was less magnified. The poor physical health and degree to which these men were willing to rely on others appear to have had little effect on their mental health as these men did not believe family, friends, or peers were important in controlling their illness.

An identical moderation effect was found in the regression of mental health on powerful other people, physical health, and emotional control. In this analysis, emotionally controlled men with poor physical health and strong powerful other people beliefs demonstrated negative mental health. According to Addis and Mahalik (2003), men who employ emotional control to manage their emotions may fail to voice vulnerabilities that elicit support. In the present study, this unwillingness to express emotions may have left men alone to cope with their emotions, an outcome which is likely to diminish mental health (Addis and Mahalik, 2003). Men with poor physical health who were willing to discuss emotion, by contrast, evinced positive mental health when they believed families friends, or peers were a significant resource in combating and controlling their cancer. Though further research on this association is needed as well, the positive mental health of this latter group may underscore benefits of emotional expression for men with poor physical health who believe powerful other people are instrumental in controlling illness (Roesch et al., 2005). Finally, the interaction of these variables was less pronounced among men demonstrating weaker powerful others control beliefs. The poor physical health and degree to which these men were willing to confide in others appear to have had less influence on their mental health as these men did not believe powerful other people were an important means of controlling and combating their cancer.

Together, these findings highlight the complex interactive relationship between beliefs in the capacity of family, friends, and peers to control prostate cancer and men's mental health. Though this research is the first to demonstrate such an association among men with prostate cancer, it is consistent with a growing body of literature suggesting that no simple main effect relationship exists between powerful others beliefs and the psychological adjustment of medically ill populations (e.g., Andrykowski and Brady, 1994; Christensen *et al.*, 1991).

However, as a result of important design limitations these findings should be interpreted cautiously. First, given the correlational nature of the study, inferences about directional causation are speculative. Second, the generalizability of the current findings may be compromised by the socio-demographic homogeneity of respondents. Ninety-two percent of participants, for example, were Caucasian, while 90% were heterosexual, 83% earned over \$40,000 annually, and 87% were married. Third, all variables assessed in the study were obtained through self-reports via a web-based survey without the aid of confirming diagnostic interviews. Consequently, scores on these variables may not reflect the actual demographic, medical, or psychological characteristics of participants. Finally, as participation in the study was anonymous, the authors were unable to determine if men who completed the survey were members of the support group or the prostate cancer listservs. As such, participants in these groups may differ in some unmeasured way.

These qualifications notwithstanding, several directions for research may be deducted from the present investigation. First, as this study demonstrated the association between global beliefs about the influence of family, friends, and peers on prostate cancer and men's mental health, future research might examine the relationship between beliefs about the *independent* influence of each of these groups on cancer and mental health. For instance, though men with prostate cancer often view their wives as their most significant asset in controlling general emotional and physical complications (Roberts et al., 2006), peers are most frequently employed to cope with *specific* side effects (e.g., urinary incontinence) [Gray et al., 1997]. While clearly speculative, men with prostate cancer may derive unique benefits from beliefs about the capacity of each of these groups to control their illness.

Second, though participants in the current study may have considered the specific treatment-induced side-effects they had experienced (e.g., erectile dysfunction, urinary incontinence) when rating their physical health, future research may benefit from a more explicit focus on these side-effects and their association with mental health. For instance, the most common side effects of treatment for prostate cancer are erectile dysfunction and bowel and urinary incontinence (Eton and Lepore, 2002). As these side effects are also largely uncontrollable and a significant source of emotional distress for men with prostate cancer (Eton and Lepore, 2002; Helgeson and Lepore, 2004), future studies may benefit from examining their potential moderating influence as well.

Finally, as this study is the first to demonstrate the moderating influence of men's adherence to masculine scripts for self-reliance and emotional control on the relationship between health locus of control and mental health, research should replicate our findings among different medical populations. Though generally confined to men with prostate cancer, a growing body of studies indicates that men's adherence to masculine scripts such as self-reliance and emotional control represents an important correlate of their adaptation to disease (e.g., Gray et al., 2002; Helgeson and Lepore, 2004). As maintaining positive mental health following treatment for a variety of ailments (e.g., end-stage renal disease, stroke, congestive heart failure) may require dependence on others (Christensen et al., 1991; Morris et al., 1991, Murberg et al., 1998), greater consideration of men's adherence to these masculine scripts may represent an important step in better understanding their adjustment to these diseases.

Results of the investigation may also offer direction to clinicians treating men with prostate cancer. Specifically, given the significant interactions obtained in the study, clinicians who treat men with prostate cancer might attend to the effects of these interactions on mental health. For example, when treating men with strong powerful other people control beliefs and poor physical health who evince problematic self-reliance, interventions might focus on increasing reliance on family, friends, and peers by stressing that accepting the assistance of these groups is an act toward combating prostate cancer rather than a vulnerability (Robertson, 2001). Similarly, given these men's beliefs in the importance of other individuals in controlling disease, health care

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providers can aid them in identifying positive sources of support such as spouses, significant others, coworkers, or friends (Courtenay, 2001) and by highlighting the potential benefits of reliance on these individuals. Treatment of men with strong powerful other people beliefs and poor health who demonstrate problematic emotional control, by comparison, may focus on reducing emotional restriction. For example, therapists can stress that prostate cancer is difficult to adjustment to, and that expressing vulnerable feelings to others may represent a critical aspect of recovery (McCarthy and Holliday, 2004). Men who evince problematic emotional control may also be prompted to explore how restricting emotionality precipitates feelings of disconnection or isolation (Mahalik et al., 2003a). Each of these interventions may increase emotional expression, and dramatically improve the mental health of men treated for prostate cancer (Courtenay, 2001).

In conclusion, men with prostate cancer experience significant obstacles to positive mental health following treatment for their illness (Eton and Lepore, 2002). Unfortunately, relatively little is known about factors that promote or impede men's adjustment following treatment for the illness (Eton and Lepore, 2002). As such, the present investigation reflects an advance in identification of these factors. Specifically, this study extends the work of previous researchers by applying an interactive framework to powerful other people locus of control, physical health, self-reliance, and emotional control among men treated for prostate cancer. Through this framework, clinical theorists and practitioners can better understand conditions under which strong beliefs in the impact of family, friends, or peers on disease prove adaptive or maladaptive for men in their efforts to control and combat prostate cancer.

REFERENCES

- Addis, M. E., and Mahalik, J. R. (2003). Men, masculinity, and the contexts of help-seeking. Am. Psychol. 58: 5–14.
- American Cancer Society (2005a). Cancer statistics 2005 presentation. Retrieved September 21, 2005 from http://www. cancer.org/docroot/PRO/content/PRO_1_1_Cancer_Statistics_ 2005_Presentation.asp
- American Cancer Society (2005b). *Detailed guide: Prostate cancer*. Retrieved September 21, 2005 from http://www.cancer. org/docroot/CRI/content/CRI_2_4_1X_What_are_the_key_ statistics_for_prostate_cancer_36.asp?rnav = cri
- American Cancer Society (2006). Overview: Prostate Cancer: How many men get prostate cancer? Retrieved February 17, 2006 from http://www.cancer.org/docroot/CRI/content/CRI_2_2_ 1X_How_many_men_get_prostate_cancer_36.asp?sitearea =

- American Cancer Society (2005c). Types of treatment. Retrieved September 21, 2005 from http://www.cancer.org/docroot/ ETO/ETO_1.asp
- Andrykowski, M. A., and Brady, M. J. (1994). Health locus of control and psychological distress in cancer patients: Interactive effects of context. J. Behav. Med. 17: 439–548.
- Burns, S. M., and Mahalik, J. R. (in press). Understanding how masculine gender scripts may contribute to men's adjustment following treatment for prostate cancer. Am. J. Men's Health.
- Burns, S. M., Maniss, S., Young, L. R. L., and Gaubatz, M. (2005). Attributions of control and seropositivity among Latinos: Examining the predictive utility of the locus of control construct. *AIDS Care* 17: 263–269.
- Christensen, A. J., Turner, C. W., and Smith, T. W. (1991). Health locus of control and depression in end-stage renal disease. J. Consul. Clin. Psychol. 59: 419–424.
- Courtenay, W. H. (2001). Counseling men in medical settings: The six-point HEALTH plan. In Brooks, G. R., and Good, G. E. (Eds.), *The New Handbook of Psychotherapy and Counseling with Men.* Jossey-Bass, San Francisco, pp. 59–91.
- Dunn, D. W., Austin, J. K., and Huster, G. A. (1999). Symptoms of depression in adolescents with epilepsy. J. Am. Acad. Child and Adolesc. Psychiatry 38: 1132–1138.
- Eton, D. T., and Lepore, S. J. (2002). Prostate cancer and healthrelated quality of life: A review of the literature. *Psycho-Oncology* 11: 307–326.
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. J. Pers. Soc. Psychol. 46: 839– 852.
- Frank, R. G., and Elliott, T. R. (1989). Spinal cord injury and health locus of control beliefs. *Paraplegia* 27: 250–256.
- Frazier, P. A., Tix, A. P., and Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *J. Counsel. Psychol.* 51: 115–134.
- Gray, R. E., Fitch, M., Davis, C., and Phillips, C. (1997). Interviews with men with prostate cancer about their self-help group experience. J. Palliative Care 13: 15–21.
- Gray, R. E., Fitch, M. I., Phillips, C., Labrecque, M., Fergus, K. D., and Klotz, L. (2002). Prostate cancer and erectile dysfunction: Men's experiences. *Int. J. Men's Health* 1: 15–29.
- Helgeson, V. S., and Lepore, S. J. (1997). Men's adjustment to prostate cancer: The role of agency and unmitigated agency. *Sex Roles* 37: 251–266.
- Helgeson, V. S., and Lepore, S. J. (2004). Quality of life following prostate cancer: The role of agency and unmitigated agency. *J. Appl. Soc. Psychol.* 34: 2559–2585.
- Kimmel, S. B., and Mahalik, J. R. (2005). Body image concerns of Gay Men: The roles of minority stress and conformity to masculine norms. J. Consult. Clin. Psycholo. 73: 1185–1190.
- Kugler, J., Tenderich, G., Stahlhut, P., Posival, H., Korner, M. M., Korfer, R., and Kruskemper, G. M. (1994). Emotional adjustment and perceived locus of control in heart transplant patients. J. Psychosomatic Res. 38: 403–408.
- Lintz, K., Moynihan, C., Steginga, S., Norman, A., Eeles, R., Huddart, R., Dearnaley, D., and Watson, M. (2003). Prostate cancer patients' support and psychological care needs: Survey from a non-surgical oncology clinic. *Psycho-Oncology* 12: 769–783.
- Llorente, M. D., Burke, M., Gregory, G. R., Bosworth, H. B., Grambow, S. C., Horner, R. D., Golden, A., and Olsen, E. J. (2005). Prostate cancer: A significant risk factor for late-life suicide. *Am. J. Geriatric Suicide* 13: 195–201.
- Mahalik, J. M., Good, G. E., and Englar-Carlson, M. (2003a). Masculinity scripts, presenting concerns, and help-seeking: Implications for practice and training. *Prof. Psychol.* 34: 123– 131.
- Mahalik, J. R., Lagan, H. D., and Morrison, J. A. (in press). Health behaviors and masculinity in Kenyan and U.S. college students. *Psychol. Men and Masculinity*.

- Mahalik, J. R., Locke, B., Ludlow, L., Diemer, M., Scott, R. P. J., Gottfried, M., and Freitas, G. (2003b). Development of the conformity to masculine norms inventory. *Psychol, Men and Masculinity* 4: 3–25.
- McCarthy, J., and Holliday, E. L. (2004). Help-seeking and counseling within a traditional male gender role: An examination from a multicultural perspective. J. Counsel. Dev. 82: 25– 30.
- Morris, P. L. P., Robinson, R. G., Raphael, B., and Bishop, D. (1991). The relationship between the perception of social support and post-stroke depression in hospitalized patients. *Psychiatry* 54: 306–315.
- Murberg, T. A., Bru, E., Aarsland, T., and Svebak, S. (1998). Social support, social disability and their role as predictors of depression among patients with congestive heart failure. *Scand. J. Soc. Med.* 26: 87–95.
- Pirl, W. F., Siegel, G. I., Goode, M. J., and Smith, M. R. (2002). Depression in men receiving androgen deprivation therapy for prostate cancer: A pilot study. *Psycho-Oncology* 11: 518–523.
- Powel, L. L., and Clark, J. A. (2005). The value of the marginalia as an adjunct to structured questionnaires: Experiences of men after prostate cancer surgery. *Qual. Life Res.* 14: 827–835.
- Roberts, K. J., Lepore, S. J., and Helgeson, V. (2006). Socialcognitive correlates of adjustment to prostate cancer. *Psycho-Oncology* 15: 183–192.
- Robertson, J. M. (2001). Counseling men in college settings. In Brooks, G. R., and Good, G. E. (Eds.), *The New Handbook* of Psychotherapy and Counseling with Men. Jossey-Bass, San Francisco, pp. 146–169.

- Roesch, S. C., Adams, L., Hines, A., Palmores, A., Vyas, P., Tran, C., Pekin, S., and Vaughn, A. A. (2005). Coping with prostate cancer: A meta-analytic review. *J. Behav. Med.* 28: 281–293.
- Swinney, J. E. (2002). African Americans with cancer: The relationships among self-esteem, locus of control, and health perception. *Res. Nurs. Health* 25: 371–382.
- Wallston, K. A., Stein, M. J., and Smith, C. A. (1994). Form C of the MHLC scales: A condition-specific measure of locus of control. J. Pers. Assess. 63: 534–553.
- Wallston, K. A., Wallston, B. S., and DeVellis, R. (1978). Development of Multidimensional Health Locus of Control scales. *Health Educ. Monogr.* 6: 160–170.
- Ware, J. E., and Kosinski, M. (2001). SF-36 physical and mental summary scales: A manual for users of version 1. (2nd Ed.). Lincoln, RI: QualityMetric, Inc.
- Ware, J. E., Snow, K. K., Kosinski, M., and Gandek, B. (1993). SF-36 Health Survey: Manual and interpretation guide. Boston, MA: The Health Institute, New England Medical Center.
- Watson, M., Greer, S., Pruyn, J., and Van Den Borne, B. (1990). Locus of control and adjustment to cancer. *Psychol. Rep.* 66: 39–48.
- Wei, J. T., Dunn, R. L., Litwin, M. S., Sandler, H. M., and Sanda, M. G. (2000). Development and validation of the expanded prostate cancer index composite (EPIC) for comprehensive assessment of health-related quality of life in men with prostate cancer. Urology 56: 899–905.
- Willener, R., and Hantikainen, V. (2005). Individual quality of life following radical prostatectomy in men with prostate cancer. Urolog. Nurs. 25: 88–90, 95–100.

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