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Cancer and mastery: Do age and cohort matter?

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ABSTRACT

The prevailing lay and medical views of cancer as an uncontrollable and unpredictable disease raise a question about the effect of cancer on personal mastery. Does cancer undermine individuals' beliefs? Are cancer survivors more likely than persons without cancer to feel that life is beyond their control? Using data from the 1994–1995 and 2004–2006 waves of the National Survey of Midlife Development in the United States, I compared cancer survivors and individuals without cancer to examine the association between cancer and personal mastery. According to the stress process perspective, cancer may be detrimental to personal mastery, whereas the positive catalyst perspective suggests that cancer can enhance mastery. When changes in personal mastery are placed in the joint context of developmental aging processes and socio-cultural transformations reflected in the experiences of birth cohorts, support is found for both perspectives. In the three oldest cohorts born between 1920s and 1940s, personal mastery declines with age for all participants regardless of their cancer status. Yet, this age-related decline is steeper among cancer survivors than their peers without cancer. In the two youngest cohorts born in the 1950s and 1960s, individuals without cancer have a higher level of personal mastery than cancer survivors, yet cancer survivors exhibit a more pronounced increase in mastery with age than persons without cancer. This study suggests that a life course framework can enhance our understanding of cancer-related changes in personal mastery because the life course perspective integrates a psychological focus on adult development and aging with a sociological focus on socio-historical and cultural contexts.

"The rest of my life is a question mark" (Kaiser, 2008, p. 83). These words of a breast cancer survivor epitomize uncertainty inherent in cancer. The prevailing lay and medical views of cancer as an uncontrollable and unpredictable disease (Clarke & Everest, 2006; Zafar, Alexander, Weinfurt, Schulman, & Abernethy, 2009) raise a question about the effect of cancer on beliefs in personal mastery. Does cancer undermine individuals' beliefs that their actions can bring about desired outcomes? Are cancer survivors more likely than persons without cancer to feel that life is beyond their control and they can do little to change important things?

Research on the association between cancer and the sense of control is scarce, which is surprising given that personal control or mastery may have profound implications for physical and mental health of cancer survivors. Control beliefs are associated positively with preventive health behaviors, adhering to treatment regimens, optimism about early medical treatment for cancer, and self-rated health (Baum & Posluszny, 1999; Seeman & Seeman, 1983). In addition to potential health benefits, high levels of personal control or mastery may improve psychological well-being and increase effective coping with stressors (Pearlin, 1999; Pudrovska, Schieman, Pearlin, & Nguyen, 2005). From a clinical perspective, the importance of improving quality of life among cancer survivors (Doyle, 2008) requires a better understanding of the ways in which mastery might change after a cancer diagnosis.

In addition to clinical significance, this question has important theoretical implications because of its potential to integrate psychological and sociological perspectives. An approach integrating individual development and macrosocial influences would allow placing psychological resilience and vulnerability of cancer survivors in the larger socio-historical and cultural context. A life course perspective appears to be a particularly fruitful framework for such integration because it provides avenues for exploring the interplay of developmental aging processes and socio-historical influences reflected in the experiences of birth cohorts (Elder & Liker, 1982). The present study is based on the 1994–1995 and 2004–2006 waves of the National Survey of Midlife Development in the United States (MIDUS), a large nationally representative study of men and women aged 25–74 years old at baseline. Using

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a life course framework, I compared cancer survivors and individuals without cancer to examine the association between cancer and mastery in the context of developmental processes of aging and "transformations of the social world" (Ryder, 1965, p. 861).

Trajectories of personal mastery after a cancer diagnosis

There are many related facets of control in sociology and psychology. In this study, the sense of control is viewed as personal mastery, or "the extent to which one regards one's life chances as being under one's own control in contrast to being fatalistically ruled" (Pearlin & Schooler, 1978, p. 5). Individuals with high mastery believe that their actions can influence the direction of their lives and bring about desired outcomes (Pearlin, 1999; Wallston, Wallston, Smith, & Dobbin, 1987).

Cancer is a complex process that can be a source of profound stress and disruption but also present new experiences and learning opportunities. According to the *stress process perspective* (Pearlin, 1999), cancer may be detrimental to personal mastery. In clinical practice, cancer is viewed as a chronic extreme stressor (Sumalla, Ochoa, & Blanco, 2009) that can undermine the sense of control over one's body and life in general (Taylor, 1983). The diagnosis of cancer can be particularly threatening because it is associated with fears of pain, death, and debilitating or disfiguring treatment (Heidrich, Forsthoff, & Ward, 1994); thus, cancer may present an enduring testimony of the inadequacy of one's efforts to control personal destiny (Schieman & Turner, 1998). Furthermore, the sense of personal control over one's life can be compromised by uncertainty accompanying the course of cancer. The life-threatening nature of a cancer diagnosis leads to a heightened realization of one's mortality and the insecure nature of the body and self (Shaha, Cox, Talman, & Kelly, 2008). Cancer survivors describe feeling powerless after completion of treatment and unsure of what they can do to help themselves (Doyle, 2008; Kaiser, 2008).

In contrast to the stress process perspective, the *positive catalyst perspective* suggests that cancer can enhance the sense of mastery (Ryff, Keyes, & Hughes, 2003). A diagnosis of cancer may open up opportunities and challenges a person has never experienced before and, thus, create a powerful motivation for engaging in self-improvement (Heidrich et al., 1994). A person confronted with a life-threatening experience is often faced with the necessity to work hard to gain "mastery over the event in particular and over one's life more generally" (Taylor, 1983, p. 1161). Moreover, current medicine places a high emphasis on patients themselves in choosing treatment options, following treatment regimens, and making lifestyle choices (Cockerham, 2005; Shaha et al., 2008). In addition, the discourse of cancer survivorship has gained strength in the North American culture since 1985 after the publication of Dr. Fitzhugh Mullan's article "Seasons of Survival" (Kaiser, 2008; Mullan, 1985). Public cancer narratives of the last two decades have been abundant with metaphors, such as "conquering cancer" and "winning the battle with cancer," that encourage cancer survivors to get involved in their illness and take responsibility for their lives (Kaiser, 2008). Cancer is often linked to heroism, positive transformations, and opportunities for self-control and self-development (Clarke & Everest, 2006; Seale, 2002). Media reinforce the idea that patients can control cancer by an effort of will (Seale, 2002). This pervading emphasis on envisioning and planning for a future despite cancer may bolster feelings of personal mastery.

Thus, from the stress process perspective, cancer as a powerful chronic stressor may be detrimental to the sense of mastery. In contrast, the positive catalyst view predicts that cancer is an existential challenge and a learning opportunity that promotes personal mastery. I test these hypotheses in the context of age-related developmental changes and socio-historical transformations reflected in the experiences of birth cohorts.

Age differences in the association between cancer and mastery

The distribution of both mastery and cancer varies by age. Sense of control increases between young adulthood and late midlife and then declines (Mirowsky & Ross, 2007; Wolinsky, Wywrich, Babu, Kroenke, & Tierney, 2003). Cancer incidence is low in young adulthood, increases in midlife and early old age, and somewhat declines at very advanced ages (Horner et al., 2009). Cancers that affect younger people can be considered "off-time" compared to similar conditions that develop at later stages of the life course. A stress process view on the life course suggests that "off-time" transitions tend to entail particularly negative psychological outcomes (Pearlin, 1999). Indeed, research shows that older cancer survivors exhibit better psychological adjustment than younger persons with cancer (Mosher & Danoff-Burg, 2005). Yet, older persons with cancer may have lower survival and fewer treatment options than their younger counterparts (Zafar et al., 2009). A poor prognosis and limited options may undermine older adults' feelings of mastery and beliefs that they can control their disease and life in general.

Thus, existing research suggests that the association between cancer and mastery can vary by age. Consistent with the life course perspective, however, I examined age-related changes in the sense of mastery among cancer survivors and individuals without cancer in the context of cohort experiences.

Social context and experiences of birth cohorts

Whereas age effects represent intra-individual development, cohort effects reflect cultural and social processes through which individuals sharing a birth year move together at a particular life course stage. Each cohort has distinctive characteristics reflecting the circumstances of its unique entry in the social world and subsequent age-graded exposure to social conditions and cultural transformations (Ryder, 1965). In my analysis, I distinguish five 10-year birth cohorts: individuals born in the 1920s (Cohort 1), 1930s (Cohort 2), 1940s (Cohorts 3), 1950s (Cohorts 4), and 1960s (Cohort 5). In addition to distinctive social and cultural imprints (Henretta, 2007; Pavalko, Gong, & Long, 2007), these five cohorts have had differential experiences with cancer. Earlier cohorts experienced lower cancer incidence than more recent cohorts. In contrast, the 5-year cancer survival rates progressively improved for each successive birth cohort since the 1930s (Horner et al., 2009). Thus, compared to older cohorts, younger cohorts witnessed higher cancer incidence but also better survival after a cancer diagnosis. I hypothesized that the effect of cancer on one's sense of control depends not only on age-related developmental processes but is also shaped by cohort membership that reflects socio-cultural transformations and population-wide cancer patterns.

In sum, although personal mastery is a potentially important dimension of the quality of life after a cancer diagnosis, research on the association between cancer and the sense of control is scarce. Using the life course perspective as a guiding framework, I analyzed changes in personal mastery over a 10-year period among cancer survivors and persons without cancer in five birth cohorts to explore the interplay of age and cohort influences.

Methods

The data for this analysis came from the two waves of the National Survey of Midlife Development in the United States (MIDUS), a study of non-institutionalized English-speaking adults in

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the contiguous United States. The first wave (MIDUS I) was conducted in 1994–1995. The main sample included 4242 participants aged 25–74. In addition, interviews were conducted with 951 siblings of the main participants and 1996 twins identified in the Twin Screening Project. The response rate for the MIDUS I telephone interview was 70% in the main sample. Among the telephone participants, 86.3% completed self-administered questionnaires. A longitudinal follow-up (MIDUS II) of the original study was conducted in 2004–2006. The longitudinal retention rate for the entire sample was 70%. The main sample in MIDUS II contained 2257 participants, the sibling sample included 733 siblings of the main participants, and the twin sample included 1484 twins. Self-administered questionnaires in MIDUS II were completed by 1805 main participants (80% of phone participants), 637 siblings (87% of the phone participants), and 1204 twins (81% of the phone participants). Analyses were based on the pooled longitudinal sample of main participants, siblings, and twins who participated in the two waves of the MIDUS study and completed both phone interviews and mail questionnaires ($N = 3544$).

Sample attrition

To address the possibility that mastery affects the risk of attrition, a logistic regression analysis was conducted, which revealed 1.16 higher odds of participation in the follow-up among people who had higher levels of personal mastery at baseline. Because there is some evidence of an outcome-dependent attrition bias, I adjusted for the hazard of attrition in all models using Stata command "heckman" with option "nshazard." In addition, ANOVA comparisons showed that persons who had cancer in Wave 1 and participated in Wave 2 were similar in terms of baseline personal mastery to individuals with cancer who were deceased by Wave 2. Likewise, no difference in personal mastery was observed between two groups of participants who were deceased by Wave 2: persons with cancer at baseline and persons without cancer at baseline. Thus, there was no evidence that attrition among cancer patients, including selective mortality, might significantly bias the findings.

Measures

Each time-varying variable in the analysis includes both baseline (MIDUS I) and follow-up (MIDUS II) values. The measure of *personal mastery* comprises seven items from Pearlin and Schooler's (1978) mastery scale and five other items. Participants were asked about the extent of agreement or disagreement with statements such as "What happens in my life is often beyond my control" and "What happens to me in the future mostly depends on me." Response categories range from (1) "strongly agree" to (7) "strongly disagree." Individual items were reverse-coded if necessary so that higher scores corresponded to higher levels of personal mastery. All items were averaged to create a single score ($\alpha = .84$ in both waves).

The focal predictor variable is the *presence or absence of a cancer diagnosis.* At each wave, it was coded 1 if a person had ever been diagnosed with cancer and 0 for people without a cancer diagnosis. In addition to the overall indicator of cancer, separate variables were created for *cancer types*: breast, colon, prostate, female genitourinary cancer, lung, lymph, and "other" cancer. Further, a dummy indicator of *multiple cancers* reflected 34 persons who reported diagnoses of two different cancers, and 4 persons who had three cancers. *Treatment* was coded 1 for persons who were undergoing treatment for cancer at the time of the interview. Moreover, I adjusted for age at cancer diagnosis and time since diagnosis to explore the effects of age as a developmental stage net of other time effects. *Age at cancer diagnosis* was included as a linear and squared term. *Time since diagnosis* was measured as a continuous variable in years and, alternatively, represented with four mutually exclusive dummy variables: 0–2 years, 2–4 years, 4–8 years, and over 8 years.

Age and cohort

I categorized participants into five 10-year birth cohorts shown in Table 1: individuals born in the 1920s ($n = 355$), 1930s ($n = 654$), 1940s ($n = 933$), 1950s ($n = 946$), and 1960s ($n = 656$). *Cohort* is included in all models as an ordinal variable with five categories (0 = the oldest cohort and 4 = the youngest cohort). *Age* was coded in years. Age at baseline ranged from 25 to 74 years old, and the participants had aged on average nine years by the follow-up.

Physical characteristics

My analysis included measures of comorbidity, physical symptoms, and functional limitations, which enable me to distinguish the effect of cancer per se from age-related declines in health. Comorbidity was assessed as the *number of chronic illnesses* other than cancer diagnosed by a physician in the past 12 months. The measure of *functional limitations* reflects the extent to which participants' health limited activities of daily living, such as lifting or carrying groceries, bathing or dressing oneself, climbing several flights of stairs, bending, kneeling or stooping, and walking more than one mile. In addition, I included an indicator of *physical activity limited because of health* (1 = "not limited at all", 2 = "limited a little", 3 = "limited a lot"). Finally, *pain* was represented with three mutually exclusive categories: no pain, pain that did not interfere with activities, and pain that interfered with activities.

Sociodemographic characteristics

All models include participants' *gender* and *race.* Gender was coded 1 for *women* and 0 for *men*. Race was represented with three mutually exclusive dummy variables: *White* (reference category), *Black*, and o*ther race*. The categories of *education* included less than high school, high school or GED (reference category), some college, bachelor's degree, and graduate or professional degree. The measure of *income* was a natural log of the respondent's total household income. *Employment* status was coded 1 if a participant was working for pay at the time of the interview and 0 otherwise. Five mutually exclusive categories represent *marital status*: married (reference category), cohabiting, divorced/separated, widowed, and never married. *Parental status* was assessed with the total number of children (0 for nonparents) and the presence of at least one child under 18.

Analytic approach

I estimated a three-level random-intercept model: Level-1 units (measurements for a given individual at two time points) are nested within Level-2 units (individuals), and individuals are nested within Level-3 units (families, i.e. sibling groups). The outcome in the model is the sense of mastery measured at two occasions (MIDUS I and MIDUS I) for each individual in each sibling group. The focal predictor is an interaction term among cancer, age, and cohort.

The model is specified to compare two categories: all persons with cancer to all persons without cancer. In a preliminary analysis, I also estimated an alternative "three-category" specification comparing persons who had never been diagnosed with cancer to two groups of cancer survivors: persons who had cancer at baseline and persons who did not have cancer at baseline but were diagnosed by the follow-up. Because the patterns of personal mastery in the two cancer groups were very similar, only results from the two-category specification are reported. The model that has only two

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Table 1
Distribution of cancer and personal mastery by age and cohort: MIDUS, 1995–2006.

Cohort	*N*	Birth year	Age in MIDUS I	Age in MIDUS II	*n* (%) *ever* diagnosed with cancer		Mean personal mastery (95% CI)	
					MIDUS I	MIDUS II	MIDUS I	MIDUS II
1	355	1920–1929	66–75	76–85	63 (24.05%)	114 (22.94%)	5.40 (5.29–5.52)	5.18 (5.07–5.29)
2	654	1930–1939	56–65	66–75	82 (31.30%)	146 (29.38%)	5.62 (5.54–5.70)	5.63 (5.55–5.71)
3	933	1940–1949	46–55	56–65	72 (27.48%)	133 (26.76%)	5.63 (5.56–5.70)	5.70 (5.64–5.77)
4	946	1950–1959	36–45	46–55	34 (12.98%)	71 (14.29%)	5.59 (5.53–5.66)	5.58 (5.52–5.65)
5	656	1960–1970	25–35	35–45	11 (4.20%)	33 (6.64%)	5.74 (5.68–5.82)	5.61 (5.54–5.69)
Total	3544				262 (100%)	497 (100%)	5.61 (5.58–5.65)	5.59 (5.56–562)

comparison groups (cancer versus non-cancer) is more parsimonious. More importantly, cancer is rare in the general population, so there are relatively few cancer survivors in this community-based sample. Subdividing cancer survivors into two groups reduces the statistical power substantially, especially given that three-way interactions among cancer, age, and cohort were tested. Along with the gain in statistical power, however, combining all persons with cancer in one group could potentially present a problem of reverse causation. Longitudinal mixed models link contemporaneous information about time-varying predictors and outcomes (Singer & Willett, 2003). Because cancer and personal mastery are both time-varying, the specified model could become problematic if personal mastery caused cancer, and not vice versa. Yet, it is reassuring that personal mastery at baseline did *not* predict cancer at the follow-up net of age (OR = .95; $p = .374$); therefore, endogeneity is unlikely to be a problem in this analysis. Another potential caveat is that the fixed-effects specification would be more appropriate than the random-effects specification because the analysis is based on only two waves of data. I examined the cancer × age × cohort interaction in a fixed-effects model (available upon request), and the findings were very similar to the random-effects model. All analyses were conducted in Stata 10 (StataCorp, 2007).

Results

As indicated in Table 1, among people who participated in both waves, 262 had cancer at baseline and 235 developed new cancer by the follow-up; thus, the total number of cancer survivors in MIDUS II was 497. About 30% of persons with cancer are in the 66–75 age group (age in MIDUS II), about 27% are in the 56–65 age group, and 23–24% are in the oldest age group. Finally, 20% of cancer survivors belonged to the two youngest age groups. In addition, Table 1 shows the average levels of mastery and 95% confidence intervals for each cohort in MIDUS I and MIDUS II. The only statistically significant changes were the declines in personal mastery in the oldest cohort (from 5.40 in MIDUS I to 5.18 in MIDUS II, $p < .01$) and the youngest cohort (from 5.74 in MIDUS I to 5.61 in MIDUS II, $p < .05$).

The joint effects of cancer, age, and cohort on the sense of mastery are shown in Table 2. A bivariate analysis by specific cancer types (available upon request) revealed that breast, colon, prostate, female genitourinary, lung, lymphatic, and skin cancers as well as cancers in the residual "other" category were associated negatively with the sense of mastery, although these associations reached statistical significance only for breast and "other" cancer. Yet, the limited number of people in specific cancer categories precluded a detailed analysis of age and cohort differences in the effects of cancer types. Therefore, the models presented in Table 2 combined all persons with cancer in one category, which seems reasonable given that the main effects of different cancer types on personal mastery are similar.

Model 1 in Table 2 indicates that cancer had no direct effect on personal mastery net of age, cohort, and a wide array of sociodemographic and socioeconomic characteristics. Age was associated negatively with mastery, and a quadratic age term was not significant. Cohort was not significantly related to mastery net of age. Model 2 in Table 2 was the central model in this analysis. It shows that the effect of cancer on the sense of mastery was contingent on the interaction of age and cohort influences. Fig. 1 illustrates the cancer × age × cohort interaction term significant at the .01 level ($b = .006$, $SE = .002$). The slopes of the lines show the extent of change in mastery with age, whereas the location of each line relative to the *Y*-axis indicates the level of mastery in each cohort.

In the youngest cohort born in the 1960s (Cohort 5), individuals without cancer had a higher level of personal mastery than cancer survivors. Yet, whereas mastery grew with age only slightly among

Table 2
Unstandardized regression coefficients and standard errors from the three-level random-intercept models of the associations among cancer, age, cohort, and personal mastery: MIDUS, 1995–2006 ($N = 3544$).

Variable	Model (1)	Model (2)	Model (3)
Fixed Part:			
Constant	5.385	5.401	6.124
Cancer = 1	−.012 (.040)	.315* (.163)	.390* (.163)
Age	−.004* (.002)	−.007* (.003)	−.006* (.003)
Cohort (0 = 1920–1929)	−.032 (.021)	−.024 (.022)	−.069** (.022)
Interactions:			
Cohort × Age		.001 (.001)	−.001 (.001)
Cancer × Age		−.014* (.007)	−.014* (.007)
Cancer × Cohort		−.128* (.066)	−.133* (.065)
Cancer × Age × Cohort		.006** (.002)	.005* (.002)
Sociodemographic Characteristics:			
Female = 1	−.051 (.033)	−.052 (.034)	.019 (.032)
White (reference group)			
Black = 1	−.054 (.081)	−.056 (.082)	−.037 (.077)
Other race = 1	−.061 (.100)	−.063 (.100)	−.012 (.095)
Physical Characteristics:			
Currently in treatment for cancer = 1			.174 (.092)
Multiple cancers = 1			−.007 (.046)
Number of chronic illnesses			−.059*** (.005)
Functional limitations			−.169*** (.029)
Limited physical activity			−.029 (.021)
No pain (reference group)			
Pain but not interferes = 1			.015 (.055)
Pain interferes = 1			−.078* (.036)
Random Part:			
Level-three random intercept variance (between-family) ψ_{11}	.173 (.024)	.172 (.024)	.163 (.021)
Level-two random intercept variance (between-individual) ψ_{22}	.375 (.025)	.376 (.025)	.316 (.021)
Level-one variance (within-individual) θ_{ij}	.454 (.011)	.453 (.011)	.447 (.011)
Log likelihood	−9408.98	−9403.69	−9200.42
AIC	18,863.98	18,861.39	18,468.86
BIC	19,021.90	19,046.78	18,702.30

Note. $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$ (two-tailed). Each cell contains unstandardized regression coefficients with standard errors in parentheses. All models adjust for the hazard of attrition, education, income, employment status, marital status, the number of children, and the presence of children 18 or younger.

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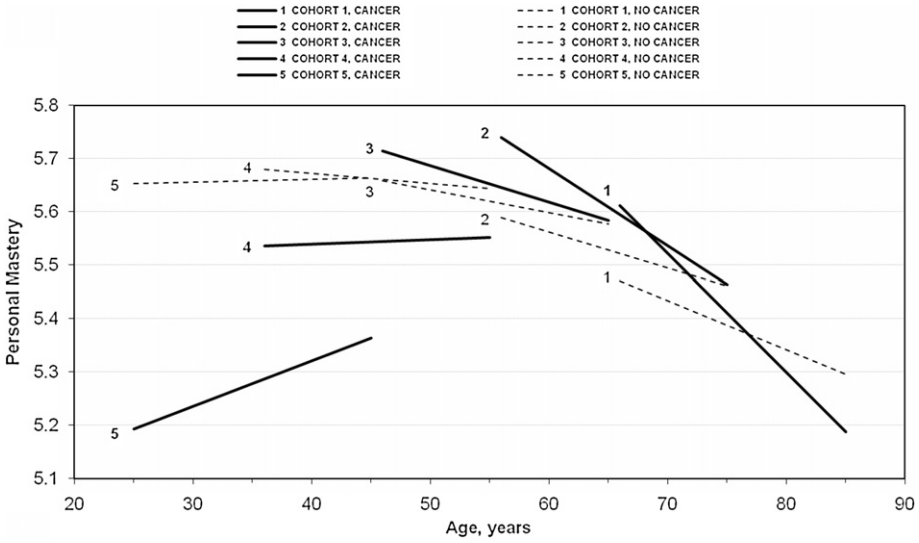

Fig. 1. Age and cohort variation in the association between cancer and personal mastery: MIDUS, 1995–2006 ($N = 3544$). Fig. 1 is based on Model 2 in Table 2. The slopes of the lines show the extent of change in mastery with age, whereas the location of each line relative to the *Y*-axis indicates the level of mastery in each cohort. Each line in Fig. 1 covers 20 years on the age scale because individuals are grouped in 10-year cohorts and the follow-up period is approximately 10 years.

persons without cancer, it showed a pronounced increase among cancer survivors. Because of this increase, the gap in the sense of mastery between individuals with and without cancer diminished with age. The findings for Cohort 5, however, should be interpreted with caution because this cohort had the fewest cancer survivors: 11 persons with cancer at baseline and 33 at the follow-up. Similarly, among people born in the 1950s (Cohort 4), cancer survivors had a somewhat lower level of mastery than persons without cancer. Because the sense of mastery slightly increased with age among cancer survivors and slightly decreased with age among persons without cancer, this difference in mastery became smaller over time.

In the three oldest cohorts (Cohorts 1, 2, and 3), the levels of personal mastery were initially *higher* among persons with cancer than persons without cancer. Yet, the sense of mastery declined with age for all participants regardless of their cancer status, and this age-related decline was *steeper* among cancer survivors than their peers without cancer. Therefore, the gap in mastery between individuals with and without cancer diminished with age. Among members of the oldest cohort aged 76–85 years at the follow-up, a crossover occurred because the oldest persons with cancer exhibited the most pronounced decline in the sense of mastery with age.

In sum, mastery increased with age among cancer survivors born in the 1950s and 1960s, slightly increased among persons without cancer born in the 1960s, and decreased with age for all other participants regardless of cohort membership and cancer status. Cancer survivors in the two youngest cohorts had lower levels of personal mastery than their peers without cancer but also experienced an increase in mastery with age. Conversely, persons with cancer in the three oldest cohorts reported higher levels of mastery but also a steeper age-related decline than their counterparts without cancer.

Further, I conducted additional analyses to incorporate other components into these complex age and cohort patterns. Model 2 was fitted separately for men and women. The age and cohort patterns in the association between cancer and personal mastery appeared similar for men and women, although the small number of cancer survivors in Cohorts 4 and 5 precluded significance tests of the four-way interaction among cancer, age, cohort, and gender. Moreover, I examined the potential role of age at cancer diagnosis and time since diagnosis in extensive analyses using linear terms, quadratic terms, and dummy variables. Neither main nor interactive effects were significant, and age at diagnosis and duration since diagnosis do not explain the effects of current age and cohort membership on the association between cancer and mastery.

Finally, Model 3 includes physical characteristics that may confound the effect of age because comorbidity and functional limitations are more prevalent among older adults. The coefficient for the focal three-way interaction term slightly declined but remained significant at the .05 level. Chronic illnesses, functional limitations, and pain that interferes with activities diminished the sense of mastery. Yet, the age and cohort patterns in the association between cancer and mastery were not explained by these health problems.

Discussion

Using data from the 1994–1995 and 2004–2006 waves of the National Survey of Midlife Development in the United States, I compared the sense of personal mastery among cancer survivors and individuals without cancer. Consistent with the life course perspective, changes in personal mastery are considered in the joint context of developmental aging processes and socio-cultural transformations reflected in the experiences of birth cohorts. My findings reveal that the effect of cancer on personal mastery depends on the interplay of age and cohort influences. The findings support both stress process and positive catalyst perspectives.

Cancer as a stress process

In the three oldest cohorts (Cohorts 1, 2, and 3), persons with cancer reported higher initial levels of personal mastery than persons without cancer. Yet, personal mastery declined with age for all participants regardless of their cancer status, and this age-related decline was *steeper* among cancer survivors than their peers without cancer. Cancer survivors in the oldest cohort (Cohort 1 born in the 1920s) exhibited the most pronounced decline in the sense of mastery with age. Extensive additional analyses revealed that these patterns were driven specifically by age as a life-course stage, and not age at the cancer diagnosis or duration since diagnosis.

With respect to aging developmental processes, it is consistently documented that older persons exhibit the lowest levels of personal control than other age groups even in the absence of life-threatening chronic illnesses (Mirowsky, 1995; Mirowsky & Ross, 2007). In addition to this developmental decline in personal mastery, older

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cancer patients have to cope with cancer in the midst of rising levels of physical impairment inherent in the aging process. Functional limitations and physical decline in late life can limit one's range of possible activities and impose real constraints that compromise older adults' beliefs in controlling their lives (Mirowsky, 1995). Under these circumstances a reduced sense of mastery may appear realistic, whereas strong beliefs in personal control may be maladaptive (Mirowsky, 1995; Wrosch, Scheier, Carver, & Schulz, 2003). Moreover, because people are less likely to experience active emotions with advancing age (Ross & Mirowsky, 2008), declining beliefs in personal control may be a natural consequence of the transition from active to passive psychological states.

In addition to aging processes, the sense of mastery is shaped by differential experiences of birth cohorts. The oldest cohorts in this study have been exposed from childhood through most of their adult lives to the predominant cultural discourses of cancer's invincibility and patients' powerlessness (Black, 1995). Cantor (2006) describes a pervasive image of cancer in the 1950s as a hopeless or incurable condition. The public fear of cancer contributed to stigmatization and social isolation of people with cancer (Clarke & Everest, 2006). These prevailing cultural messages of cancer as invincible and patients as powerless victims were incompatible with the idea that cancer can be an opportunity to take charge of one's life and future. The emphasis on fatalistic acceptance of cancer in the first half of the 20th century can explain why older cancer survivors, especially in the 1920s birth cohort, experienced steeper declines in personal mastery with age than their cohort peers without cancer.

Cancer as a positive catalyst

In the two youngest cohorts born in the 1950s and 1960s (Cohorts 4 and 5), individuals without cancer had a higher level of personal mastery than cancer survivors. Yet, in each of these cohorts, cancer survivors exhibited a more pronounced *increase* in personal mastery with age than persons without cancer. In contrast to the older cohorts, the effect of cancer on the sense of mastery in these two youngest cohorts is largely consistent with the positive catalyst prediction. From a developmental perspective, cancer is a psychosocial transition (Parkes, 1971) that inevitably causes people to question their assumptions about the familiar world that used to be taken for granted. After the diagnosis, individuals may be forced to develop new ways of coping and mastering unanticipated challenges (Cordova, Cunningham, Carlson, & Andrykowski, 2001). Cancer may promote new insights about the self in the context of adversity, such as the knowledge of personal strengths, limitations, and coping skills (Taylor, 1983). These processes of conquering the new reality and coping with existential stressors may be particularly conducive to personal mastery.

In addition to developmental processes, the increase in personal mastery among younger cancer survivors can be explained by cohort patterns reflecting a change in the public discourse of cancer from fatalistic acceptance to putting up a good fight. Cancer forcefully entered the U.S. public domain in the 1970s when several well-known women, including Betty Ford, shared their experiences of breast cancer (Kolker, 2004). Moreover, mortality rates for most cancer types started declining or leveled off in the 1970s and 1980s after a continuous increase since the 1930s (Horner et al., 2009). This new realization that cancer is amenable to treatment and can be conquered was reflected in the proliferation of war and battle metaphors as well as in the shifting perceptions of cancer patients from victims to survivors (Clarke & Everest, 2006; Kaiser, 2008). Cancer has become a battle, a mere participation in which can promote beliefs in one's control over personal destiny.

Implications for social research and clinical practice

This study integrates sociological and psychological perspectives on personal mastery and cancer. A psychological focus on adult development is combined with a sociological focus on social transformations reflected in the experiences of birth cohorts. The life course perspective provides an overarching framework integrating both views. A psychological emphasis on intra-individual development promotes a dynamic view of personal mastery over time among persons with and without cancer. As a turning point, cancer is a milestone in adult development that can affect the direction of trajectories in the sense of mastery. On the other hand, a sociological perspective can enhance our understanding of psychological adjustment to cancer by incorporating socio-historical and cultural contexts. This study shows the importance of considering psychological consequences of cancer in the joint context of adult development and macro-level influences represented by cohort differences.

With respect to clinical implications, although mastery increased with age for the two youngest cohorts of cancer survivors, it decreased with age for everyone else. Therefore, clinical psychosocial interventions for cancer patients should not overstate a potential for cancer-related increase in personal mastery. The emphasis on heroic resistance to cancer may exaggerate opportunities for displays of moral character and impose on individuals unrealistic expectations that cancer can be controlled by willpower (Seale, 2002; Stanton, Revenson, & Tennen, 2007). At the same time, my analysis revealed the steepest declines in mastery among the oldest cancer survivors. Given that the sense of control was shown to be associated with adherence to treatment regimens, quality of life, and even improved physical health (Seeman & Seeman, 1983), psychosocial interventions directed at enhancing personal mastery among older adults with cancer can be particularly beneficial. Such interventions will be consistent with the emphasis on improving the quality of life among cancer survivors (Doyle, 2008) because mastery is an integral dimension of successful psychological functioning (Pearlin, 1999).

Limitations and future directions

Although MIDUS is one of the longitudinal social surveys with the most detailed measures of physical and mental health over time, information on certain cancer characteristics is not available, including a stage of cancer at diagnosis, treatment type, and recurrence. Moreover, because cancer is relatively rare in the general population, there are few people with specific cancer types in community samples. Therefore, I could not analyze age and cohort differences in the effects of cancers at different sites. Despite these limitations, this study makes an important contribution to research on cancer survivors' sense of mastery and expands our understanding of the interplay of developmental and socio-cultural influences on psychological adjustment to chronic illness.

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