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LITERATURE REVIEW

Life Course Perspectives on the Onset and Continuity of Preventive Healthcare Behaviors

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Abstract Preventive healthcare is considered a cornerstone of good health and well-being that can play a major role in reducing a country's healthcare costs and improving both the length and quality of people's lives. Previous research on preventive healthcare behaviors has been predominantly cross-sectional, ignoring the dynamic nature of people's health behaviors over a full life span. As a result, the reasons for the development, stability, and changes of individuals' preventive healthcare behaviors over time remain relatively unknown. Our article contends that to understand the degree of people's engagement in preventive healthcare behaviors, we must understand the origins, continuity, and discontinuity of such behaviors. We offer the life course paradigm as a viable framework for studying preventive healthcare behaviors at different stages in life. Based on theory and previous research, our article proposes that the onset, continuity, and changes in preventive healthcare behaviors are the outcomes of physical, social, and emotional demands triggered by life events that require adaptation through the mechanisms of socialization, stress and coping, and human development. These mechanisms are the underlying change processes of the three main life course theoretical perspectives—normative, stress, and human capital, respectively. Our paper discusses implications of adopting the life course approach for theory and practice, and offers a research agenda in the form of general propositions and conceptual directions for future research.

Keywords Preventive healthcare · Life course perspectives · Adaptation processes · Health behaviors

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Introduction

Preventive healthcare has become an increasingly prominent global public health topic (Hunter & Reddy, 2013) due to the rise in the number of deaths and the increased economic burden related to chronic diseases. To achieve the global goal of the prevention and control of these diseases as well as the reduction of healthcare costs, promoting lifestyle modifications and achieving health behavioral changes to improve health outcomes are essential (Murray & Lopez, 1996).

In the past, there has been a rising interest in a life course approach to chronic disease epidemiology (Kuh & Ben-Shlomo, 2004). Life course epidemiology has paid particular attention to the long-term study of the effects of biological and social events on chronic disease risk across an individual's life course (Ben-Shlomo & Kuh, 2002; Kuh & Ben-Shlomo, 2004). This research has focused on the study of the links between early life conditions and later-in-life lifestyles (e.g., smoking, diet, exercise, alcohol consumption) in order to identify health risks and explain the onset and progression of chronic diseases (Kuh, Ben-Shlomo, Lynch, Hallqvist, & Power, 2003).

The life course paradigm is a multi-theoretical conceptual framework that has been extensively employed to study various events individuals experience over the course of their lives (Billari, 2009; Elder, 1998). This paradigm suggests that changes in earlier-in-life conditions in the form of experienced life events create changes in patterns of thoughts and actions in later life as the result of adaptation through the processes of socialization, stress and coping, and human development (Moschis, 2007a). These mechanisms, which are triggered by life events, are moderated by a variety of contextual variables (e.g., social class, gender, age and cohort; Elder, George, & Shanahan, 1996). As changes in behavior unfold across time and take place in different contexts, this paradigm takes a more time- and context-dependent approach to the study of behavior. Therefore, life course research seeks to understand how the time and timing of events affect behavioral trajectories, human agency (i.e., the choices people make and the ways they have adapted to various circumstances), and the historical and changing socio-cultural contexts in which people are embedded (Elder, 1998).

Because preventive healthcare behaviors can be conceptualized as a complex and dynamic process of development, continuity, and change over time, the various models that have been proposed to help predict preventive healthcare behaviors leave much to be desired because they are generally based on cross-sectional studies (e.g., Jayanti & Burns, 1998; Moorman & Matulich, 1993). As a result, earlier investigations have fallen short of explaining the reasons for individuals' changes in preventive healthcare behaviors over their life span and, specifically, how people's earlier life conditions within changing contexts influence and shape their subsequent trajectories of preventive healthcare behaviors. We thus propose the life course paradigm as a research approach that has been used to study various forms of behavior across time because it can potentially help address issues related to the onset, continuity, or discontinuity of a person's preventive healthcare behaviors.

The purpose of our article is to advocate the life course paradigm as an overarching multi-theoretical framework that researchers could adopt for studying the development of and changes in individuals' preventive healthcare behaviors, which may include a wide variety of activities such as physical exercise, consumption of vitamins and mineral supplements, and regular physical examinations. Specifically, we first introduce a general conceptual model that provides a blueprint for discussing life course concepts and perspectives. Next, we provide illustrations of how researchers could employ the life course paradigm by interpreting previous research findings in the context of this model, and suggest future research directions in the form of general propositions regarding the effects of earlier life experiences and the underlying mechanisms that are relevant to the onset and modification of preventive healthcare behaviors. Finally, we discuss the implications of applying a life course perspective to specific preventive healthcare behaviors, which is of potential interest to policy makers in designing public health promotion and intervention programs, and we also provide directions for research helpful in developing specific hypotheses to test in future studies.

A Conceptual Model

To demonstrate how researchers could use the life course approach to study the development of and changes in preventive healthcare behaviors, we have developed a conceptual model (Fig. 1) based on the general life course paradigm's assumptions about the relationships among the types of variables used in life course research. Relevant theories and research findings are also presented to provide support for the model's relationships.

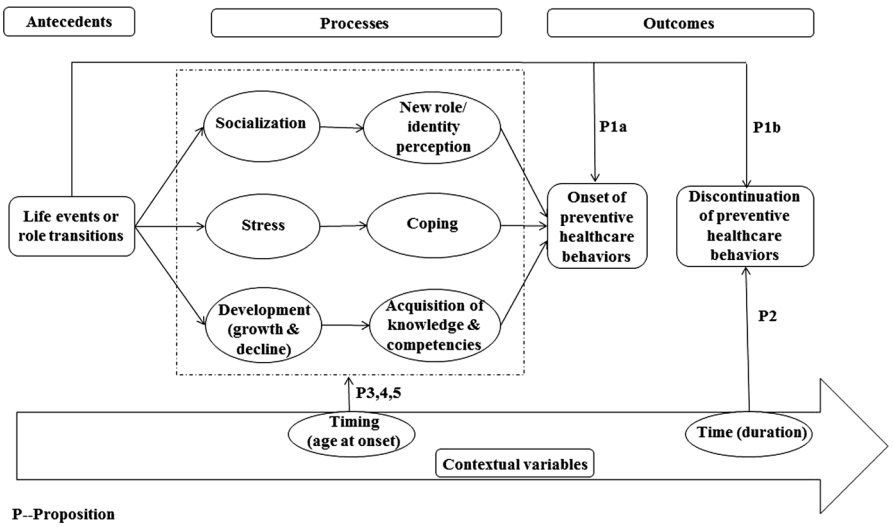

Fig. 1 A conceptual model of life course and its adaptation processes for preventive healthcare behaviors. Adapted from Moschis (2007a)

Model Elements

The model elements presented in Fig. 1 can be classified into four broad categories (Moschis, 2007a). The first category is *experienced or anticipated life events or role transitions* in the person's life (labeled as "antecedents"). These events can be both expected (e.g., marriage, retirement) and unexpected (e.g., diagnosis of life-threatening disease, serious accident). The second category comprises three *adaptation processes* (labeled as "processes") triggered by experienced and anticipated events or changes. It includes the mechanisms of (1) *socialization* due to role transition events (e.g., marriage, birth of first child, retirement) leading to a *new role and identity perception* (e.g., spouse, parent, retiree); (2) acute or chronic *stress* requiring *coping* responses to restore psychological homeostasis; and (3) *development (growth and decline;* e.g., intelligence, cognition, memory) in human capital resulting in the *acquisition of knowledge and competencies* (e.g., health literacy, caregiving skills). The third category involves the consequences of prior life events or changes and adaptation processes in the forms of *onset*, *duration* (*time*), and *discontinuation* of preventive healthcare behaviors (labeled as "outcomes"). The fourth category includes the *contextual variables* (shown in the arrow at the bottom) that define the circumstances in which events and changes occur (Elder & Johnson, 2002). They include the timing and duration of an event, as well as structural and contextual factors defined at different levels of aggregation; they include both macro-level (e.g., culture, SES, family structure), and micro-level (e.g., gender, personality, lifestyle) factors, and earlier-in-life experiences (e.g., events, life conditions). These contextual variables have moderating effects on adaptation mechanisms and on the way a person experiences and reacts to an event at a given point in time (e.g., Giele & Elder, 1998).

Life course research suggests that events or transitions are interdependent (Mayer & Tuma, 1990) and create a chain of events or changes over time (Singer, Ryff, Carr, & Magee, 1998). Because any change in behavior or attitude is conceived of as an event in life course research (Mayer & Tuma, 1990), life changes in the form of experienced events or role transitions can directly influence the onset and discontinuation of preventive healthcare behaviors. In addition, engagement in preventive healthcare behaviors can be considered a consequence of adaptation to earlier life events or changes through three processes of socialization, stress and coping, and development. These processes are the underlying change mechanisms of the three life course perspectives (Abeles, Steel, & Wise, 1980; Moschis, 2007a)—normative, stress, and human capital, respectively—that are viewed as complementary rather than competing (Sherrod & Brim, 1986). The paragraphs that follow briefly explain these three perspectives and cite previous health-related findings to provide support for each of these mechanisms of the proposed life course model.

Normative Perspective

The basic premise of this perspective is that "there are social norms governing the order, continuity, and timing of role transitions and that deviations from the

prescribed patterns result in the application of sanctions" (Abeles et al., 1980, p. 319). According to the normative perspective, changes in thoughts and behaviors are the results of the assumption of new roles and the relinquishment of old ones. Major life events can cause changes in social roles, responsibilities and expectations. For instance, marriage, birth of first child, death of a spouse, and retirement serve as markers of transition into the roles of spouse, parent, widow(er), and retiree, respectively. To enact new roles, people need to acquire socially desirable skills or motivations and behave in a way that is consistent with these roles (Gierveld & Dykstra, 1993; Moschis, 2007a). Through this adaptive process, role transitions can influence health-related behaviors either positively or negatively (Baranowski, Weber, & Basen-Engquist, 1997; Hammer & Vaglum, 1990). For example, previous research shows that transition into the widowhood role has an adverse effect on eating behaviors and nutrient consumptions (Rosenbloom & Whittington, 1993). A systematic review of the literature conducted by Allender, Hutchinson, and Foster (2008) suggests that changes in life events or role transitions affect participation in physical activities. These authors report that events such as retirement and the death of a spouse for middle-aged women are associated with an increase in physical activity, whereas a change in employment, change of residence, or birth of a child generally decreases physical activity participation levels. In addition, other contextual factors, such as socioeconomic status and gender, have an effect on physical activity. For instance, participation in sports and exercise is greater among individuals with higher income and educational attainment (Lunn, 2010). Gender differences have also been reported: men spend more time on physical activities than women (Fortier, Katzmarzyk, Malina, & Bouchard, 2001; Nomaguchi & Bianchi, 2004). Furthermore, socialization agents such as peers and family members may have a positive effect on mineral intakes among high school students (Barr, 1994).

Stress Perspective

Stress refers to the disruption of a person's psychological equilibrium due to internal or external changes. This perspective assumes that changes in thoughts or actions are the result of coping responses to stress in order to restore homeostasis (Thoits, 1995). Major life events, such as the birth of a child, marriage, separation, divorce and job loss, are viewed as stressors (Myers, Lindenthal, & Pepper, 1971). Coping responses may entail thoughts and behaviors that are effective in reducing stress during a given period in the life course, but these responses may also become habitual behaviors through the assimilation of such processes over time (Lazarus & Folkman, 1984). These behavioral adaptations can have positive effects on one's health, as in the case of a fitness program that a person initiates for the purpose of handling stress but later continues even during stress-free times. Coping responses can also take the form of behaviors that have adverse effects on the person's health and have the potential of becoming addictive (e.g., smoking, drinking alcohol, substance use; e.g., Byrne, Byrne, & Reinhart, 1995; Sinha, 2001; Steptoe, Wardle, Pollard, Canaan, & Davies, 1996). The literature is rich in studies that report a wide

variety of thoughts and actions used as coping responses that affect a person's health (e.g., Moschis, 2007b).

Human Capital Perspective

Human capital refers to the resources, competencies, skills, and knowledge that people acquire and which "influence future income and consumption" (Frytak, Harley, & Finch, 2003, p. 627). This adaptation perspective of the life course paradigm views life events and role transitions, as well as the macro- and micro-environments (e.g., culture, SES, personality) in which people are embedded, as sources of intellectual development (both growth and decline) that are likely to cause changes in thoughts and behaviors over the life course (Abeles et al., 1980; Elder et al., 1996; Frytak et al., 2003).

The growth and decline of human capital and subsequent behavioral adaptations over the course of a life are explained by three theories (e.g., Moschis, 2007a). The first of these, *organismic* theories, view humans as active constructors of knowledge within their biological constraints, wherein human agency can influence the development and decline of a person's cognitive system in response to changing environments and demands (e.g., Baltes, Hayne, & Lewis, 1980). Organismic theories are commonly used in the studies of individuals who are able to adapt to the new environments they encounter, such as the development of shopping skills (e.g., Gaeth & Heath, 1987; John, 1999; Stampfl, Moschis, & Lawton, 1978). The second, *mechanistic* theories, view humans as reactive, with human capital development and accumulation over the life course deriving from, and influenced by, environmental factors (Bolger, Caspi, Downey, & Moorehouse, 2007). The mechanistic view of the development of behaviors triggered by the effects of macro- and micro-environment factors can be observed in research on smoking onset (Yang & Netemeyer, 2015).

The third, *contextual* theories, view the development of knowledge and competencies as outcomes of bidirectional and dynamic interplay between individual and environment due to an ongoing emergence of needs and crises (e.g., Riegel, 1975; Turner & Avison, 1992). Eventually, when faced with major life events or crises, such as the diagnosis of a life-threatening disease or a serious accident, people can change their lifestyles and attitudes towards health and adopt new behaviors (Elder et al., 1996; Frytak et al., 2003). Previous research reveals that the acquisition of health-related knowledge can lead to healthful practices (van Zuuren, Grypdonck, Crevits, Walle, & Defloor, 2006). For example, Schutzer and Graves (2004) report that acquiring more knowledge of and developing new attitudes towards the health benefits of exercise constitute motivators for initial involvement in an exercise program. Similarly, preadolescent females who are aware of weight-bearing physical activity are more likely to consume more dietary calcium (Levers-Landis et al., 2003). Moreover, individuals who seek cancer-related knowledge are more likely to adopt healthful practices and undergo a cancer screening (Shim, Kelly, & Hornik, 2006).

Insights from the Life Course Paradigm

The life course paradigm may be employed to study the effects of salient life events and transitions on the onset and alteration of health behavior trajectories. In applying life course notions to explain preventive healthcare behaviors, earlier-in-life events may cause events in a later life that in turn influence stability or change of behavioral patterns (Hirvensalo & Lintunen, 2011). For example, getting married, becoming a parent, and retirement have been found to affect behavioral patterns of physical activity (Corder, Ogilvie, & van Sluijs, 2009; Raymore, Barber, & Eccles, 2001). People likely adapt to different health-related events (e.g., chronic conditions) and behavioral patterns (e.g., tobacco use, eating habits) in much the same way they adapt to other changing life conditions. This section develops a set of general propositions that provide conceptual directions for future research. These notions may also apply to both the onset of a new form of preventive healthcare behavior as well as to the discontinuity of an existing one, as proposed in the next two hypotheses, respectively.

Proposition 1a *The greater the number of life events or role transitions people experience within a particular life period, the greater the likelihood of their onset of preventive healthcare behaviors during a later period.*

Proposition 1b *The greater the number of life events or role transitions people experience within a particular timeframe after the onset of a preventive healthcare behavior, the greater the likelihood that they will discontinue this behavior.*

Life events that signify transitions into new and likely lasting environments or states (e.g., relocation, job change, retirement) require greater mental and behavioral adaptation and have adverse developmental consequences (Featherman & Lerner, 1985; Hetherington & Baltes, 1988). In contrast, temporary changes in behaviors need short-term adjustments and have few or no developmental implications. Thus, a lengthy engagement in an activity increases the likelihood of the stabilization of that activity (Elder & Johnson, 2002; Elder, Johnson, & Crosnoe, 2003). These arguments can be extended to the field of preventive healthcare.

Proposition 2 *The longer people engage in a particular preventive healthcare behavior, the higher the likelihood of the continuity of that behavior.*

The life course paradigm further suggests that people adopt preventive healthcare behaviors as a result of the life events they have experienced through the adaptation mechanisms of socialization, stress and coping, and development (growth and decline). With respect to socialization, people acquire resources (e.g., attitudes, motivations, skills) and act in a way that fits their new role and then gradually develop their new identity (Gierveld & Dyskstra, 1993; Moschis, 2007a), such as that of a retiree or a divorcee. Nonetheless, the degree of impact of transitions into new roles and the relinquishment of previous social identities vary according to the life stage an individual is experiencing (Elder et al., 1996). Younger adults are more likely than older adults to experience more and different types of life events or transitions and thus assume a wider variety of roles and identities (Chiriboga &

Dean, 1978; Hughes, Blazer, & George, 1988). Therefore, a loss or gain of a role or identity has less impact on younger adults because they are able to adjust themselves more easily and effectively to various life circumstances (Baltes & Baltes, 1990). On the other hand, older people occupy fewer roles and identities so they have to commit more of their resources to those limited roles and identities (Thoits, 1983). Hence, they are less likely to change their behavioral patterns that require an adjustment to a new role or state. These notions could explain the negative relationships between age and changes in select behaviors within a specified period of time (Andreasen, 1984). As a result, because of the differences in the number of roles people occupy at different stages in life, those in the earlier life stages are more likely to acquire socially desirable motivations and norms through socialization processes that lead to their engagement in preventive healthcare practices.

Proposition 3 *The strength of socially desirable motivations for preventive healthcare behaviors is moderated by age, in such a way that younger adults have a greater likelihood of initiating preventive healthcare behaviors through socialization processes than their older counterparts.*

When the life events and role transitions that people experience are viewed as stressors, there is a generalized demand for readjustment or coping, which can affect their lifestyle (e.g., Andreasen, 1984). People manage to restore psychological homeostasis by initiating new behaviors or modifying their existing ones. For example, individuals may try to deal with psychological distress or negative feelings by engaging in preventive healthcare activities such as exercising (e.g., Moschis, 2007b). Nonetheless, given the same life events, people with different socio-demographic characteristics exhibit different degrees of stress levels (Thoits, 1995). Various studies on stress suggest that people from disadvantaged social groups are more vulnerable to stressors (e.g., Thoits, 1991). For example, when experiencing major life events and role transitions, the elderly exhibit higher psychological distress than their younger counterparts (Thoits, 1983, 1995), thus increasing the likelihood of changes in or the onset of new behaviors to cope with the stress.

Proposition 4 *The effect of stress on preventive healthcare behaviors is moderated by age, insofar as older adults have a greater likelihood of initiating preventive healthcare behaviors through stress and coping responses than their younger counterparts.*

The human capital contextual view of adaptation suggests a reciprocal and dynamic interplay between the individual and changing environments, including life events (or crises) that lead to the acquisition of knowledge, skills, and competencies over time. Therefore, the contextual theories are generally employed to determine the effects of a person's knowledge about, and engagement in, preventive healthcare behaviors. For example, life events such as a diagnosis of a chronic or life-threatening disease can lead to the acquisition of health-related knowledge and caregiving skills (Albright, Parchman, & Burge, 2001). Most findings from research on this topic generally support the notion that "when (crises) are resolved, the individual may emerge from these engagements with a new skill, confidence, or

other enabling self-attitude that is added to his or her repertoire of responses or coping mechanisms" (Turner & Avison, 1992, p. 37). Engaging in preventive healthcare behaviors is motivated by an increased health literacy and mastery that comes with the experience of life events and new life circumstances, as people are likely to experience more life events or crises with age.

Proposition 5 *The effects of health-related knowledge on preventive healthcare behaviors is moderated by age, in such a way that older adults have a greater likelihood than their younger counterparts of initiating preventive healthcare behaviors through increasing health-related knowledge.*

Implications for Research and Practice

The life course paradigm has become one of the leading theoretical orientations in social sciences (Billari, 2009; Elder et al., 2003) and has begun to serve as a research framework for studying the onset, stability, and changes in desirable and undesirable patterns of thoughts and behaviors over the life span (e.g., Moschis, 2007a). Even though this paradigm has focused on selected areas of a person's behavior (e.g., Moschis, 2007a), the application of this approach could be expanded to other areas of behavioral research, including preventive healthcare behaviors. An obvious limitation of this article is demonstrated by the sparse research findings that could be offered as justification for the propositions we have specified. A lack of such research inhibits the development of propositions regarding the effects of specific life events on the onset, continuation, or discontinuation of specific preventive healthcare behaviors. However, we hope that the reader may see the value of adopting a life course approach by using the general propositions we have offered as bases for developing specific hypotheses that could be tested in future studies. Therefore, this section provides implications for public health policy and directions for further research to help develop theory.

Public Health Policy

Our implications for public health policy would have to be based on the verification of proposed relationships within the life course paradigm and the accumulation of findings in future studies. Motivations for the onset of healthcare behaviors likely differ among individuals at different stages in life, and the effectiveness of communications that encourage engagement in preventive healthcare behaviors also likely differs across cohorts. By better understanding how people develop and change their health-related behaviors due to their experiences of specific life events, public health agencies can tailor interventions appropriately (Schmitz, French, & Jeffery, 1997). For example, the transition to widowhood can have adverse effects on a person's health due to the loss of spousal support, the stress of the bereavement, and adjusting to managing a household alone (Ross, Mirowsky, & Goldsteen, 1990; Umberson, Wortman, & Kessler, 1992). Therefore, interventions targeting those at risk that take the form of healthcare reminders and assistance received from others

may prevent the cessation of established preventive healthcare behaviors and deter the development of behaviors likely to have negative consequences on the person's heath (Williams, 2004). Thus, policies directed at developing or modifying preventive healthcare behaviors should recognize the significance of life events and health-related motives that can affect the likelihood of the onset and duration of preventive healthcare behaviors (Andersson & Stanich, 1996).

Theory and Research

The development of theory to help understand and explain preventive healthcare behaviors would require an examination of the effects of specific life events, changes and transitions related to the onset, continuity, and discontinuity of specific preventive healthcare behaviors. Research on the processes (mechanisms) by which people develop such behaviors would be useful in understanding how and why certain life events or changes are linked to the onset or cessation of preventive healthcare habits. Further, the effects of contextual variables as moderators of the linkages between life events, processes, and their outcomes could provide insights into the circumstances that promote or hinder preventive healthcare behaviors. The life course paradigm could serve as an overarching theoretical framework for studying such relationships. For example, engagement in physical activities and participation in sports at school age are important determinants of adulthood participation (Hirvensalo & Lintunen, 2011).

The material presented in our article should serve as a starting point for further research. Specific research objectives should focus on variables derived from our conceptual model, such as the following:

1. Relevant life events that increase the likelihood of the onset of specific preventive healthcare behaviors for people at different stages in life;
2. Life events or changes that deter continuity of established preventive healthcare habits at different stages in life;
3. Mechanisms that are responsible for the initiation and cessation of specific preventive healthcare activities;
4. The moderating effects of age and duration on the relationships between life events and their outcomes;
5. The moderating effects of specific individual characteristics, previous life experiences, and socio-cultural factors on the initiation of specific preventive healthcare practices through adaptation mechanisms; and
6. The relative importance of specific preventive healthcare behaviors for well-being over the life course.

Based on these general guidelines, several theoretical and empirical questions could be addressed by using the principles and perspectives of the life course paradigm to help fill the gaps in existing knowledge. Because previous studies are based on cross-sectional data, the long-term effects of role transitions on a person's health are not clear, in part because such studies do not account for the timing (age at onset), duration, or termination of preventive healthcare behaviors. It is likely that

a transition into a role has some positive as well as negative effects on a person's health, but the long-term effects of these health behaviors on health remain relatively unexplored. Nor do we know enough concerning what factors promote, deter, or support the continuation of preventive healthcare behaviors as people transition into a new life role.

Whereas stress researchers typically consider stress and coping as responses particular to a specific timeframe and with a focus on events in the present or recent past, life course researchers analyze the cumulative effects of chronic and acute stress over the period of a full life span (e.g., Elder et al., 1996; Pearlin & Skaff, 1996). This view shifts the emphasis from understanding how and why health-related thoughts and actions are used as coping responses at a given point in time to understanding their onset, continuity, and discontinuity throughout life, as well as their cumulative effects on people's health at any particular stage in life. Such a shift in research strategy is possible by employing the theoretical perspectives and methods suggested by the life course paradigm.

In conclusion, the life course paradigm appears to be a viable research framework for the study of the development of preventive healthcare practices at a given life stage and across the entire life span. It has the potential for making a significant contribution to the body of knowledge in this field, as it has in recent decades in dozens of areas of social, medical and behavioral sciences (e.g., Billari, 2009). Our article should help policy makers and researchers view preventive healthcare behaviors in the context of the increasingly popular life course paradigm.

Compliance With Ethical Standards

Conflict of Interest The authors declare they have no conflicts of interest.

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