OLDER MEN'S LAY DEFINITIONS OF SUCCESSFUL AGING OVER TIME: THE MANITOBA FOLLOW-UP STUDY*

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ABSTRACT

The concept of "successful aging" has become widely accepted in gerontology, yet continues to have no common underlying definition. Researchers have increasingly looked to older individuals for their lay definitions of successful aging. The present analysis is based on responses to five questionnaires administered to surviving participants of the male Manitoba Follow-up Study cohort (www.mfus.ca) in 1996, 2000, 2002, 2004, and 2006 ($n = 2,043$ men were alive at a mean age of 78 years in 1996). One question on each survey asked: "What is YOUR definition of successful aging?" Applying content analysis to the 5,898 narratives received over the 11 years, we developed a coding system encompassing 21 main themes and 86 sub-themes defining successful aging. We quantitatively analyzed trends in prevalence of themes of successful aging prospectively over time. Our findings empirically support colleagues' past suggestions to shift from defining successful aging in primarily biomedical terms, by taking lay views into account.

"Successful aging" has become widely accepted in gerontology to describe a state of being that while generally understood and certainly deemed desirable, has no agreed-upon standard or common underlying definition. Unresolved questions for researchers and healthcare practitioners include: What is successful aging? How should successful aging be conceptualized? Who should define successful aging? Despite acknowledgment of these questions and their associated research challenges, a proliferation of reports with the keyword "successful aging" continues to appear.

Through the latter decades of the 20th century, successful aging has been investigated, broadly speaking, via two perspectives. Some researchers have defined successful aging from a clinical perspective (Fries, 1990; Roos & Havens, 1991; Rowe & Kahn, 1987), others from a psycho-social perspective (Baltes & Baltes, 1990). Some have combined both perspectives (Valliant & Mukamal, 2001; Young, Frick, & Phelan, 2009). Tate, Lah, and Cuddy (2003) provide a comprehensive overview of the earlier successful aging models. The common element in these definitions has been that researchers have embedded their own criteria to define successful aging in their research.

Only relatively recently have investigators incorporated lay views, asking older adults for their self-definitions of successful aging (Bowling, 2006b; Bowling & Dieppe, 2005; Duay, 2006; Fisher & Specht, 1999; Hsu, 2007; Knight & Ricciardelli, 2003; Reichstadt, Depp, Palinkas, Folsom, & Jeste, 2007; Tate et al., 2003; Von Faber, Bootsma-van der Wiel, van Excel, Gussekloo, Lagaay, van Dongen, et al., 2001). Tate, Loewen, Bayomi, and Payne (2009) reported excellent consistency between themes in pairs of self-definitions of successful aging provided twice by the same man over a 30-day time period. This finding supports the utility of relying on lay definitions received via mailed question-naires to study successful aging.

Investigators have suggested that key elements of lay definitions of successful aging are not adequately captured in researcher-defined models (Bowling, 2006a; Cernin, 2006; Jeste, Depp, & Vahia, 2010; Montross, Depp, & Daly, 2006; Von Faber et al., 2001). This lack of scope has resulted in a mismatch between investigators' and individuals' classifications of personal "success" at aging. For example, Montross et al. (2006) compared self-assessed successful aging against researcher-defined criteria and found that 92% of the 205 community-dwelling sample defined themselves as having aged successfully despite having a physical illness. Bowling (2006a) assessed five researcher-defined models of successful aging using a British longitudinal survey of aging, namely: biomedical, broader biomedical, social, psychological, and lay-based. Of the 990 men and women sampled, three-quarters rated themselves as successful agers; however, only 16% to 34% qualified as aging successfully using the researcher-defined models.

In addition to the potential of lay definitions to shed light on aspects of successful aging not previously considered in researcher-defined models, recognition of subjective and lay views as pertinent in the development of a

multidimensional framework of successful aging has also become important (Bowling, 2007; Phelan, Anderson, Lacroix, & Larson, 2004; Pruchno, Wilson-Genderson, Rose, & Cartwright, 2010; Reichstadt, Sengupta, Depp, Palinkas, & Jeste, 2010). In particular, lay views may be valuable in enhancing the necessary qualitative and longitudinal inquiry involved in generating a multidimensional framework of successful aging. In turn, the qualitative analyses could contribute to making the multidimensional framework socially relevant, and the longitudinal analyses would allow researchers to continually capture evolving themes. Consequently, researchers have begun to advocate the need for longitudinal, qualitative analysis of self-definitions of successful aging (Bowling, 2007; Montross et al., 2006; Phelan et al., 2004; Young et al., 2009).

Bowling's (2007) extensive literature review concluded that prospective, qualitative analysis is needed to build a multidimensional framework for successful aging. Bowling reported that, of the 170 relevant publications reviewed, only 12 studies were qualitative. The one study that was both qualitative and longitudinal did not specifically ask for self-definitions of successful aging (Grundy & Bowling, 1999). Hence, to the best of our knowledge, no peer-reviewed research exists that involves qualitative, longitudinal analyses of self-definitions of successful aging.

Along similar lines, Phelan and Larson (2002) suggested that cohorts be re-interviewed over time to determine whether the definition of successful aging changed at the individual level. Subsequent investigation by Phelan et al. (2004) followed two cohorts of 1,985 Japanese Americans and 2,581 white men and women aged 65 years and older. The respondents were asked retrospectively if their self-definitions of successful aging had changed, with 60% reporting that a change in their self-definition had occurred.

In summary, throughout the past decade, researchers have begun to explore the broader dimensions of successful aging. The views and opinions of study participants have been documented and provide insight into some facets that could and should inform an operational definition of successful aging. A comprehensive coding system capable of capturing all themes identified from self-definitions is timely and necessary if we ever hope to produce a consistent, translatable phenotypic characterization of successful aging (Jeste, 2005). Such a coding system should be explicit about what constitutes the themes of successful aging, and should be malleable enough to accurately represent changes in successful aging definitions as they arise.

Following our initial analysis of themes of successful aging (Tate et al., 2003), it became evident that a comprehensive coding system capable of capturing more detail was needed. Furthermore, a useful coding system would have to accommodate change in evolution of themes of successful aging definitions as new themes might arise. Four key principles guided the development of the MFUS coding system. First, since successful aging means different things to different people at any point in time, a broad and multi-disciplinary approach was

needed (Bowling, 2007; Knight & Ricciardelli, 2003; Reichstadt et al., 2007; Tate et al., 2003). Second, an individual's personal definition of successful aging could change over time (Phelan et al., 2004) with change in personal circumstances. Third, the concept of successful aging changes more broadly at the societal level. That is, as society evolves, so does the societal definition of successful aging, which may in turn affect definitions at the individual level. Fourth, any efforts to define successful aging had to incorporate the lay views of older individuals themselves, in order to build a multidimensional theoretical framework that was socially relevant (Bowling, 2007).

Once such a coding system is in place, themes from a lay definition can be quantified as present or absent. We have been systematically collecting longitudinal narrative data from the cohort members of the Manitoba Follow-up Study since 1996 (Tate et al., 2003). We can now consider questions at the population level, such as whether the prevalence of each successful aging theme remains stable over time. Further, if the prevalence of a theme is found to change over time, is there a linear trend of increasing or decreasing prevalence in the theme?

In this article we describe the comprehensive coding system we developed to capture themes inherent in lay definitions of successful aging. We show that our coding system can be applied quickly and concisely. We examine two sets of analytic hypotheses that relate to the prevalence of themes that have evolved over an 11-year period of time:

- Hypothesis 1 tests the equality of the prevalence of each successful aging theme over time; and
- for those themes identified in Hypothesis 1 as having a varying prevalence over time, Hypothesis 2 tests for evidence of a linear trend in prevalence over 11 years.

METHODS

The Manitoba Follow-up Study

The Manitoba Follow-up Study (MFUS) was designed as a study of incident cardiovascular disease, with a prime interest in investigating the prognostic significance of abnormalities identified on routinely recorded electrocardiograms (Mathewson, Manfreda, Tate, & Cuddy, 1987). Since July 1, 1948, a cohort of 3,983 healthy young World War II Royal Canadian Air Force male aircrew recruits has been followed with annual contact and requests for routine medical examinations. MFUS is now in its 64th year. With the advancing age of this cohort, and recognition of the increasing importance to understand the impact of a growing aging society, the research focus of MFUS was expanded 16 years ago to include the study of successful aging.

MFUS Successful Aging Questionnaires

In the spring of 1996, 2,043 members of the MFUS cohort were alive at a mean age of 78 years, with almost all participants retired. An extensive Successful Aging Questionnaire (SAQ) was developed to examine characteristics of successful aging among the cohort. Details of this first SAQ are described elsewhere (Tate et al., 2003). The SAQ was a nine-page mail-in survey with questions that asked about physical, mental, and social functioning, living arrangements, retirement, and successful aging. In addition, the men were asked to provide a narrative response to the open-ended question: "What is your definition of successful aging?"

The SAQ was mailed to the cohort in April 1996 and returned, after two reminders, by 89% of the men. Among these, 1,745 community dwelling men provided narrative responses when asked for their definitions of successful aging. Subsequent SAQs have been mailed to the MFUS cohort in the spring of 2000, 2002, and annually since 2004. Each SAQ has included the open-ended successful aging question, a set of core questions on health, functioning, and living arrangements, and add-in questions on specific topics pertinent to aging that varied with each SAQ. To maximize response rates, a second survey was mailed to non-respondents 8 to 10 weeks after the initial mailing for each of the SAQs, except in 2004. By design, two surveys were sent to each study member in 2004, 30 days apart, to examine consistency in lay definitions of successful aging (Tate et al., 2009).

Our initial analysis of the themes from our members' lay definitions of successful aging was based on a content analysis of the 1996 SAQ as described in Tate et al. (2003). The most frequently reported themes that emerged from that analysis were: *health (physical and cognitive), life satisfaction (mental health), keeping active both physically and mentally, positive attitude, family, independence, acceptance, spirituality,* and *moderation* (Tate et al., 2003). At that time, we labeled 20 themes, some of which were very broad (e.g., health), and some of which were quite narrow in scope (e.g., financial security). With this classification it was not possible to separate individuals within the broad theme of health, for example, into themes of physical health, mental health, and health system from their definitions. Hence, new codes for each theme have been defined as sub-themes. The coding system with the 20 themes reported from our analysis of the 1996 SAQ has since been expanded to a coding system with 86 unique sub-themes. We put the 86-sub themes into 21 categories for convenience of locating the code(s) to ascribe to lay definitions of successful aging. We refer to these 21 categories as main themes. To be clear, it is not simply the case that the 20 themes from the 1996 survey were expanded by one theme to 21. The evolution of our coding system is best described as an expansion of 20 themes to 86 sub-themes. The categorization of the 86 sub-themes into 21 themes facilitates convenient coding of an individual`s lay definition of successful aging.

The thematic coding of the successful aging definitions over the 11 years of the questionnaires used for this analysis was overseen by the MFUS director (R. Tate). He trained different research assistants, clerical staff, and graduate students to participate with the coding. Independent reading and coding of the definitions were performed by three individuals, and discussion and consensus were reached as to the code(s) to ascribe. No formal determination of the reliability of the coders was documented. No qualitative software was used to determine themes, the hand-written definitions received from the MFUS members have not been entered into any electronic data system. All original paper questionnaires have been retained.

Each successful aging theme is now ascribed a three-character code (two letters and a number) wherein the two letters identify the main theme and the number identifies the sub-theme. If an individual's definition of successful aging encompasses more than one main theme or multiple sub-themes, the coding of the successful aging narrative involves assigning all of the appropriate three-character codes. In this article we describe the components of the 21 main themes and 86 sub-themes.

Statistical Methods

The statistical analyses necessary to address our two analytic hypotheses involved the examination of up to five repeat surveys for each study member over an 11-year period of time between 1996 and 2006. In total, 5,898 surveys from 1,745 men comprised this analysis. Usual statistical methods for analyzing associations and trends are not appropriate for this data. Such tests assume the independence of observations, an assumption violated here because of the repeated assessments of themes of successful aging over time from the same individual. Each individual could contribute between one and five surveys to this analysis. The appropriate statistical methodology in this instance is a generalized linear model with a binary link and a random intercept for each man to test the hypotheses for each theme of successful aging. This model accommodates a variable number of repeat measurements from an individual over time. The GLIMMIX procedure in SAS v9.2 software was used for all models examined. For Hypothesis 1, a set of 21 models were tested. Each model had four binary indicators to identify four of the five survey years. The binary dependent variable indicated presence or absence of a theme. The equality of the prevalence of each theme over time was assessed in each model by testing the significance of the joint effect of the four binary variables as a chi-square statistic with four degrees of freedom. For Hypothesis 2, the themes from Hypothesis 1 in which there were significant variations in prevalence over time were identified. One model for each of these themes, with a single variable for year of survey, was tested. An odds ratio with a 95% Confidence Interval (CI) was calculated to describe

the gradient of change per year in the prevalence of the theme. Hence, we tested one or two hypotheses for each of 21 main themes of successful aging.

RESULTS

The demographic characteristics over time of the MFUS members who returned SAQs with narrative definitions of successful aging are presented in Table 1. There were 2,043 men alive with known mailing addresses at the time of the first survey. The decline in the number of surveys mailed in successive years was due almost entirely to mortality, with very few surveys returned any year marked "Moved." Due to the age of the cohort, invariably the number of responses to each successive survey declined, but the response rate to each mailing has remained consistently high. The rate of return of surveys with at least partially completed information was 87%, 81%, 81%, 74%, and 84% over the 5 years (after two, one, one, no, and one reminders mailed 8 weeks following the initial mailing), respectively. Among the surveys returned, some had only partial information completed, some omitted a narrative response for a definition of successful aging, and some narratives were written as "I don't know." Omission of such surveys from the present analysis results in 5,898 returns completed by community living men who provided a written lay definition of successful aging.

At a mean age of 76.6 years in 1996, the proportion of men who were married decreased from 83% to 69% in 2006, suggesting that at this age, many of the men were experiencing the loss of their spouse. Over this 11-year period, in addition to more than half of the 1996 respondents dying, the health status of the survivors also declined. The percentage of men who rated their health as excellent dropped from 31% to 12%, and the proportion who rated their life satisfaction as excellent dropped from 36% to 17%.

The coding system was developed by introducing new descriptors to the inventory list of themes from the members' narratives over time. By the year 2006, the coding system was thought to be "saturated," meaning that no new themes were emerging from the narrative data. The MFUS coding system for lay definitions of successful aging is comprised of 86 sub-themes, each a descriptor of a distinct facet of successful aging. The 86 are called sub-themes, since for the ease of coding a narrative, sub-themes are grouped and labeled as main themes. Main themes are designated by the first two characters of a code, and sub-themes by three-character codes. This facilitates grouping of themes and sub-themes for later analyses.

The 21 main themes include: *Health–General*; *Health–Physical*; *Health–Cognitive*; *Health System*; *Attitude*; *Happiness*; *Living and Dying*; *Physical Activity*; *Leisure Activity and Interests*; *Lifestyle*; *Being Productive or Contributing*; *Coping, Adjustment, Acceptance*; *Adaptation*; *Spirituality/Faith*; *Relationships–Intimate*; *Relationships–Family*; *Relationships–Companionship*; *Relationships–Society*; *Independence*; *Life Experience*; and *Quality of Life.*

Table 1. Demographic Characteristics of Manitoba Follow-up Study Members Who Completed and Returned the Successful Aging Questionnaire: 1996 to 2006

Year of survey	Number of surveys mailed (% Returned)	Number of surveys returned with lay definitions of successful aging	Age in years (Mean ± Standard Deviation)	Married (%)	Self-rated health (% Excellent)	Life satisfaction (% Excellent)
1996	2,043 (87%)	1,745	76.6 ± 3.7	83	31	36
2000	1,661 (81%)	1,322	80.2 ± 3.4	79	25	34
2002	1,476 (81%)	1,154	82.0 ± 3.3	7	22	31
2004	1,215 (74%)	870	83.8 ± 3.2	74	14	27
2006	1,001 (84%)	807	85.6 ± 3.1	69	12	17

Descriptions of what constitutes each main theme, as well as examples of direct quotes from the men and the specific codes ascribed to their narratives are provided below. The man's age at the time of his definition is provided in parentheses following his quote. The scope and number of definitions that are encompassed under a main theme can vary, for example, with *Health–General* having five sub-themes, *Coping, Adjustment, Acceptance* having six, and *Spirituality/Faith* having but a single sub-theme.

Health–General (HG)

The main *Health–General* theme encompasses five sub-themes. These are: *being healthy*, *having few health problems*, *not having disabilities*, *absence of illness/sickness*, and *gradual deterioration*. The "*being healthy*" sub-theme captures non-specific definitions of health. When more detail of the frequency or progression of the member's health problems is provided, the other four sub-theme codes are used. The following examples are excerpts from study members' successful aging definitions that have been coded with a main theme of *Health–General*: "To have . . . good health [HG1]" (82y) and "Minimum health problems [HG2]" (95y).

Health–Physical (HP)

The *Health–Physical* theme encompasses the four sub-themes *good physical health, no/minimal physical disease/impairment/disabilities, physically functional (ability),* and *feeling healthy/energetic.* The *good physical health* sub-theme includes self-reports of physical health in specific areas, whereas the other three *Health–Physical* sub-themes more generally address limb health, physical functionality, and how it feels to be healthy. Examples from study members' successful aging definitions that have a main theme of *Health–Physical* are : "Pain free [HP1] with good legs [HP2]" (81y) and "To have good health in . . . body [HP1]" (81y).

Health–Cognitive (HC)

The main theme *Health–Cognitive* includes the four sub-themes *memory, mind, ability to communicate,* and *not having mental illness*. These four distinct aspects of cognitive health were emphasized as important components of successful aging by our study members. The following quotes from study members' successful aging definitions exemplify sub-themes that would be coded under *Health-Cognitive:* "Good memory [HC1]" (80y) and "To have full use of mental . . . capabilities [HC2]" (82y).

Health System (HS)

The main theme *Health System* incorporates the three sub-themes *health care provider, taking medication,* and *minimal/no health care required.* These three

sub-themes specifically describe the healthcare utilization behaviors that study members highlighted as important to successful aging. Examples include: "Good to excellent medical attention [HS1]" (79y) and "Take medication that would give relief [HS2]" (87y).

Attitude (AT)

The main theme of *Attitude* includes eight sub-themes: *positive attitude/being interested/looking ahead; having good fortune/who I am; don't think about aging; thinking young; being thankful; having virtues; having dignity;* and *less stress/worry.* As illustrated in the following examples, the *Attitude* sub-themes reflected positive psychosocial aspects of successful aging that were considered important by our study members. Two examples are: "A healthy . . . outlook [AT1]" (80y) and "Don't worry about the things you can't change [AT8]" (77y).

Happiness (HA)

The *Happiness* main theme is made up of six sub-themes: *content/satisfied/ comfortable with self; reflecting on life; sense of humour/worth; sense of purpose; enjoying/having an interesting life;* and *knowing offspring are doing well.* These six sub-themes represent different aspects of positive emotion that our study members thought were important for successful aging. Direct quotes from two study members are: "Being happy with life [HA1]" (73y) and ". . . So that your life has meaning [HA4]" (81y).

Living and Dying (LD)

The five components of this main theme are: *not aging; staying alive; chronological; comparative;* and *die quickly.* The essence of this concept is to resist the aging process, to keep on living, to live a long life, to live longer than others, and when your time *does* come, to die quickly. The following are examples of definitions of successful aging with a main theme of *Living and Dying*: "Living to be 105 [LD3]" (91y) and "Staying alive [LD2]" (88y).

Physical Activity (PA)

The four components of the main *Physical Activity* theme are: *keeping physically fit/working out; keeping physically active; participating in sports;* and *golfing*. Core concepts include exercising to keep fit, keeping physically active in a general sense, sports participation, and participation in golf. We elected to keep golf separate from the other sports in the coding system, since member narratives suggest that golf has benefits that may not be only physical, but social and psychological as well. Examples of definitions coded with the *Physical Activity* theme are ". . . lots of exercise [PA1]" (73y) and ". . . curling [PA3], golfing [PA4] . . ." (80y).

Leisure Activity and Interests (AI)

The main theme *Leisure Activity and Interests* has four sub-themes: *activity/interests/hobbies–specific; keeping active–nonspecific; pursuing interests–nonspecific;* and *performing mental activities*. The *Leisure Activity and Interests* sub-themes were coded when a member reported taking part in specific leisure activities or hobbies, when he reported keeping active or pursuing interests in a general sense, and when he mentioned performing cognitive tasks. Examples of these narratives are: "Stay active [AI2]" (79y) and "Keep up your interests [AI3]" (81y).

Lifestyle (LS)

The *Lifestyle* main theme includes the four sub-themes *nutrition; no smoking/drinking/drugs; smoking/drinking in moderation;* and *healthy lifestyle choices*. These sub-themes are meant to capture behavior that is specific to taking care of oneself physically through diet and other healthy lifestyle choices. As well, we are able to identify those who report abstention and those who report moderation. Following are examples of successful aging definitions with a main theme of *Lifestyle*: "Don't smoke [LS2], drink two glasses of 'red wine' each day [LS3]" (73y) and "Good diet [LS1]" (78y).

Being Productive or Contributing (PC)

Having goals/making plans; being productive/useful; contributing/helping family; contributing/helping friends; volunteering; and *donating to charity* are the six sub-themes included under *Being Productive or Contributing*. Core concepts embrace the usefulness felt and shown by having goals and making plans, by being productive and useful in general, by contributing to the needs of family and friends, by volunteering one's time to a worthy cause, and by supporting charities financially. Following are examples of successful aging definitions with a main theme of *Being Productive or Contributing*: "Having the ability to pursue my goals [PC1]" (72y) and "Remaining a productive member of society [PC2]" (84y).

Coping, Adjustment, Acceptance (CA)

This main theme includes three sub-themes: *coping, adjustment,* and *acceptance. Coping* captures the act (psychological and/or physical) of dealing with challenging or difficult personal stressors or negative life events pertaining to family or friends. *Adjustment* refers to the psychological adjustment that takes place in the face of stressors such as the declining health or death of a spouse or friend. *Acceptance* captures the mental recognition that personal circumstances change over time, and that one has accepted and come to terms with these changes. Following are examples of successful aging definitions with a main theme of *Coping, Adjustment, Acceptance*: "To accept that my health [CA4] . . . and

well-being [CA5] . . . is bound to decrease. So I should anticipate and accept it [CA4]" (80y) and "Coping with everyday life successfully [CA1]" (80y).

Adaptation (AD)

The main theme of *Adaptation* includes the following five sub-themes: *assistive devices; living one day at a time; moderation/accommodation; planning for future support/assistance;* and *receiving support when it is needed*. These sub-themes were used to code self-definitions of successful aging that included references to using wheelchairs, canes, and other assistive devices; taking each day as it comes; doing everything to the best of one's current ability; lessening age-related responsibilities for family members; and getting help from family and community organizations as needed. Examples of narrative definitions of successful aging that fall under the main theme *Adaptation* are: "Get hearing aids if needed and good eye glasses [AD1]" (80y) and "Do everything in moderation [AD3]" (85y).

Spirituality/Faith (SF)

Spirituality/Faith captures both religiosity and spirituality in one code, hence, it has no sub-themes. That one *has* a belief in a higher power is the core concept, rather than the presence or absence of a God. Following are examples of our study members' successful aging definitions that had a main theme of *Spirituality/Faith*: "Trust in the Lord [SF1]" (86y) and ". . . Attending church regularly [SF1]" (80y).

Relationships–Intimate (RI)

The main theme *Relationships–Intimate* was used to code self-definitions of successful aging that made reference to the study members' intimate relations. Since not many self-definitions mentioned this theme, no corresponding sub-themes were created. Sample quotes from the members' narrative responses are: ". . . reasonable sex life (RI1)" (72y) and "Keep active . . . sexually (RI1)" (75y).

Relationships–Family (RF)

The main *Relationships–Family* theme encompassed two sub-themes: *loving spouse* and *relationships with family*. The *loving spouse* sub-theme was assigned if any references were made by the study members to having a spouse or a partner. The *relationships with family* sub-theme included any references made by study members to their families. Sample quotes are as follows: "Being happily married [RF1]" (75y) and "Ability . . . to maintain rewarding relationships with family [RF2]" (81y).

Relationships–Companionship (RC)

The *Relationships–Companionship* theme included three sub-themes: *companionship/belonging; friendships/neighbors;* and *animal companionship*. These sub-themes were used to code study members' references to general feelings of belonging, as well as mentions of friends, neighbors, and pets. Examples of direct quotes are as follows: "Good friends [RC2]" (76y) and "Friendly associations with others [RC1]" (84y).

Relationships–Society (RS)

Relationships–Society encompassed two sub-themes: *keeping active socially* and *interest in/ties to the community/world*. The *keeping active socially* component captures general statements about having social contact with others. *Interest in/ties to the community/world* captures the feeling of being connected to, or interested in the world outside of one's own home. Following are examples of successful aging definitions with a main theme of *Relationships–Society:* "Meet and talk to people [RS1]" (78y) and ". . . to remain interested in local and world events [RS2]" (84y).

Independence (IS)

Independence is divided into eight sub-themes: *autonomy; make own decisions; independent living; independent activities of daily living (IADL); basic activities of daily living (ADL); mobility; driving/flying;* and *financial*. Generic statements about wanting to be independent are captured by the *autonomy* sub-theme. When more detail is given as to type of independence meant, the latter seven codes are utilized. Following are examples of successful aging definitions with a main theme of *Independence*: "Being able to take care of myself without help [IS1] . . . and do all or most of the repairs and maintenance on a house [IS4]" (86y) and ". . . Financially secure [IS8]" (83y).

Life Experience (LE)

Life Experience includes three sub-themes: *education/career; being retired;* and *having served in the war.* The first sub-theme encompasses all references made to one's education and career as being part of successful aging. The second sub-theme includes all mentions of retirement, and the third sub-theme incorporates all references to having served in the war. Following are examples of successful aging definitions with a main theme of *Life Experience*: "Keep working [LE1]" (74y) and "Able to enjoy retirement [LE2]" (89y).

Quality of Life (QL)

The main theme *Quality of Life* includes two sub-themes: *good lifestyle* and *basic needs are provided*. These two sub-themes differentiate between members' self-reports of having a good as opposed to an adequate quality of life. Quotes from the successful aging narratives with this theme are: ". . . I now enjoy a favorable lifestyle [QL1]" (76y) and "Being well fed, well clothed, and well housed [QL2]" (82y).

Successful Aging Definitions with Multiple Themes

Since a study member's definition of successful aging could encompass one or more main themes or sub-themes, the coding of his definition could result in one or multiple codes being assigned. It is also possible for some of the multi-code definitions to have a single common main theme. In this instance, the first two characters in the assigned codes would be identical.

The narrative definitions of successful aging differed widely in depth and detail. Some men provided very succinct definitions of successful aging. For example, four words written by a man in 2002 were "Staying active [AI2] and healthy [HG1]." These were coded as two sub-themes, spanning two different main themes. Other MFUS members provided more elaborate definitions of successful aging. In some cases, extensive detail led to the assignment of codes that had a single main theme. For example, one study member gave a detailed definition of successful aging in 2004 primarily in terms of the main theme *Independence*: "Being independent [IS1]. Not requiring regular assistance [IS3]. Still able to drive [IS7] . . . handle all financial details [IS2]. Still handle minor household repairs [IS4]."

In other instances, extensive successful aging definitions encompassed multiple main themes. For example, a study member wrote

> To age successfully a person must not consider that they are already old when they retire at 65 years of age [AT4]. They must have the idea in their head that they have probably at least 30 years left [LD3] to do the things that they wanted to do but never had time to do while on the job. However, they must have a definite plan for the years ahead [AD4]. In my case I always wanted to restore cars and drive them to Club functions and shows [AI1]. Since 1983 I have restored 7 cars and won 12 first or second place trophies at major shows and 20 1st, 2nd, or 3rd Parade Awards. Since it takes 8 or 900 hours to restore a car there is no time left to get 'old' [AT3] and have no more to do. At age 89 I manage my own affairs [IS2], shop for food, cook meals [IS4], take care of my body needs [IS5], maintain and drive my three restored Triumph Spitfires [IS6] and provide other restorers with the parts they require. Each evening I make a list of things to do the next day [PC1] then get up and tackle them. I never have a day with nothing planned to do. Thus, life is not boring.

The number of themes coded from any single successful aging definition varied from one to seven themes. While 38% of all 5,898 definitions had only one single theme, the majority of definitions included multiple themes. Specifically, 35% of definitions included two themes, 19% included three, and 8% included four or more different themes.

Successful Aging Definitions over Time

As shown in Figure 1, there is great variation over time in the prevalence of the 21 lay defined main themes of successful aging. As shown in Table 2, the prevalence of some of the main themes, particularly the first ten sets of histogram bars shown on the left in Figure 1, are significantly different (at $p < 0.05$) over time, with a significant linear trend of increasing or decreasing prevalence. As shown on the right in Figure 1, there is no evidence for a significant linear trend over time (p-value > 0.05) in prevalence for the other 11 main themes. The most frequent main theme of successful aging reported over all waves of the surveys was *Leisure Activities and Interests*, present in 29.6% of all definitions analyzed. The theme of *Independence* was present in one-quarter of all successful aging definitions.

We found the prevalence of eight themes to significantly decrease over time, two to significantly increase, and 11 themes with no evidence for increasing or decreasing prevalence over time. The 10 themes that varied significantly with time were tested for evidence of linear trends. The eight themes that significantly decreased in prevalence over time were *Leisure Activity and Interests; Happiness; Attitude; Health–General; Physical Activity; Relationships–Family; Being Productive or Contributing;* and *Life Experience*. The two themes that became more prevalent over time were *Coping, Adjustment, Acceptance* and *Living and Dying*. The 11 themes in which prevalence showed no trend over time were *Independence; Health–Physical; Relationships–Companionship; Adaptation; Lifestyle; Health–Cognitive; Relationships–Society; Spirituality/Faith; Health System; Quality of Life;* and *Relationships–Intimate*. The odds ratios resulting from the 10 significant ($p < 0.05$) tests for linear trends in prevalence over time (Hypothesis 2) in Table 2 can be interpreted as the relative likelihood (odds) for a theme to be present in a definition from one survey time to the next. For example, the most prevalent theme *Leisure Activity and Interests* had an odds ratio of 0.92 (95% CI 0.91, 0.94). In other words, the odds of including this theme in a definition of successful aging declined at a rate of 8% per year between 1996 and 2006.

DISCUSSION

In this article we describe a comprehensive system that was developed to code and describe themes from lay definitions of successful aging provided by older men. Further, we examined whether the prevalence of the themes from the
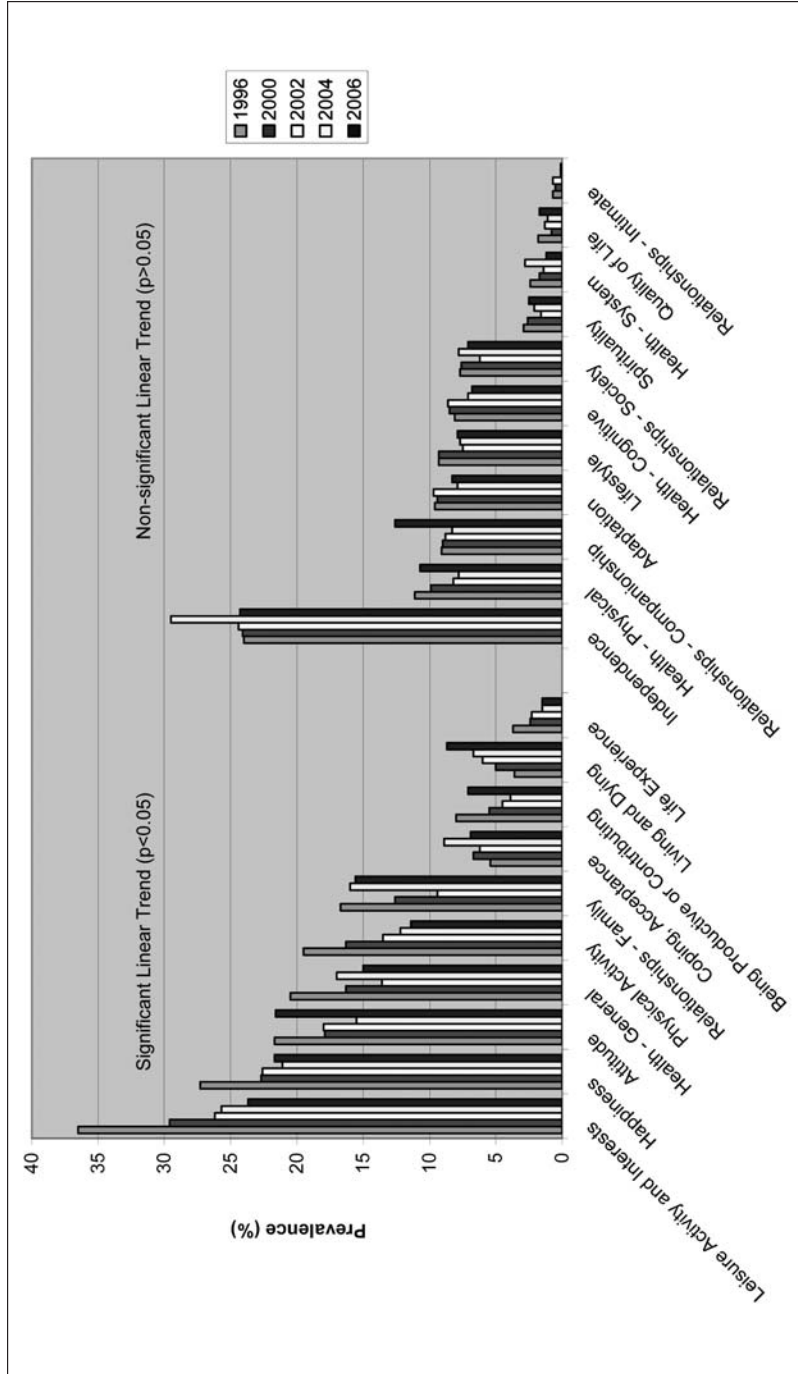
Figure 1. Themes from lay definitions of successful aging over time: 1996 to 2006.

Table 2. Examination of Equality and Linear Trend Over Time in
Prevalence of Themes from Lay Definitions of
Successful Aging: 1996 to 2006

Theme in lay definition of successful aging	Prevalence% (Number of sub-themes)	Hypothesis 1: Equality of prevalence over time Chi-square 4 *df* *p*-value	Hypothesis 2: Linear trend in prevalence over time Odds ratio (95% CI)
Leisure Activity and Interests	29.6 (4)	< 0.0001	0.92 (0.91, 0.94)
Happiness	23.7 (6)	< 0.0001	0.96 (0.94, 0.98)
Attitude	19.2 (8)	< 0.0001	0.98 (0.96, 0.99)
Health–General	17.0 (5)	< 0.0001	0.96 (0.94, 0.98)
Physical Activity	15.4 (4)	< 0.0001	0.92 (0.90, 0.94)
Relationships–Family	14.1 (2)	< 0.0001	0.97 (0.95, 0.99)
Coping, Adjustment, Acceptance	6.6 (6)	0.0361	1.04 (1.00, 1.07)
Being Productive, Contributing	6.0 (6)	< 0.0001	0.94 (0.92, 0.98)
Living and Dying	5.5 (5)	< 0.0001	1.10 (1.06, 1.13)
Life Experience	2.5 (3)	0.0018	0.90 (0.86, 0.95)
Independence	25.0 (8)	0.0414	—
Health–Physical	9.7 (4)	0.0227	—
Relationships–Companionship	9.4 (3)	0.0272	—
Adaptation	9.2 (5)	0.4659	—
Lifestyle	8.5 (4)	0.0753	—
Health–Cognitive	8.0 (4)	0.3617	—
Relationships–Society	7.3 (2)	0.4384	—
Spirituality	2.4 (1)	0.0697	—
Health–System	1.9 (3)	0.0544	—
Quality of Life	1.4 (2)	—	—
Relationships–Intimate	0.5 (1)	0.2109	—

narratives remained constant over time, and if not, whether there was evidence for an increasing or decreasing linear trend in prevalence over time.

Research on successful aging at MFUS began in the spring of 1996, a time when planning for the effects of "population aging" in Canada were gaining interest (Chappell, Gee, McDonald, & Stones, 2003). At the same time, researcher-defined concepts of successful aging were being questioned and a call for incorporation of lay views in defining successful aging was gaining prominence (Bowling & Dieppe, 2005; Phelan et al., 2004). A wide range of researcher-defined models of successful aging have been recently reviewed (Bowling, 2007). These models range from being biomedical in nature, which primarily define successful aging in terms of physical and mental functioning, to socio-psychological models, which emphasize social functioning, life satisfaction, and psychological resources such as coping, adjustment, and adaptation. Although such a wide variety of researcher defined successful aging models exists, the definition of successful aging is typically very broad, and consequently does not capture the level of detail or the subjectivity that our study members' self-definitions of successful aging provide. A classic example of this comes from Rowe and Kahn's (1998) successful aging definition, which in part includes the absence of disease and disability. When we asked our study members for their definitions of successful aging, many not only mentioned the absence of disease and disability as being important, but also, they went into considerable detail describing various diseases and disabilities that affected their ability to age successfully. Some would emphasize the importance of being pain free, while others might describe how it felt to live in pain. This level of detail and subjectivity remains conspicuously absent from many professional definitions of successful aging, thus highlighting the novel contribution of our work.

Following our initial 1996 survey of the cohort, our SAQ was administered again in the spring of 2000, 2002, and annually since 2004, each time with response rates of at least 74%. To date, more than 10,000 lay definitions of successful aging have been provided on 11 surveys of the MFUS cohort over a period of 15 years. Although some of the content of the SAQ has changed over time, the open-ended question, "What is YOUR definition of successful aging?" has remained on every survey.

Central to the development of the MFUS coding system were two main issues; the coding system had to be quick and easy to use; and it had to be flexible enough to accommodate different researchers' needs. First, by placing main themes at the top of the hierarchical coding structure with more detailed sub-themes underneath, coding of a narrative could be performed quickly and easily. For example, suppose the phrase "sense of humor" was included as part of a respondent's successful aging definition. It would be coded systematically under the main theme *Happiness* and the sub-theme *sense of humor/worth,* resulting in an assigned code of HA3. Second, the structure of the coding system, as well as its level of detail, allowed for easy reformulation to accommodate different

researchers' needs. For example, some researchers could be interested in exploring lay definitions of successful aging in terms of the World Health Organization's (2002) *health, participation,* and *security* pillars. Others may wish to combine our main coding categories of *Adaptation [AD], Independence [IS],* and *(Positive) Attitude [AT]* under a single new main theme and potentially call it "control." In both these examples, the MFUS coding system could be readily adapted to accommodate existing and evolving theories. In this way, our coding system may be easier to use than certain types of Computer Aided Qualitative Data AnalysiS (CAQDAS) software, in which once coding classifications have been created, considerable time and effort may be needed to change them (Manchester Metropolitan University, 2008).

Further to the issue of coding manually versus coding using computer software, we believe our manual coding system to be preferable, since numerous examples exist in which computer software may not be able to differentiate between correct and incorrect codes for some phrases. For example, in our coding system the phrase, "I am lucky to have had such a good life" would be coded as AT2 (luck) and QL1 (good life); whereas "I have a dog named Lucky" would not. Rather, having a dog named Lucky would be coded as RC3 (*animal companionship*) to the extent that having a dog was used in the context of the study member's successful aging definition. In contrast to manual coding, qualitative data coding software using keyword identification may interpret the dog's name "Lucky" to mean "being fortunate," and may code it as such, resulting in an incorrect code being assigned to that particular successful aging narrative. Even with manual coding, queries can arise, such as which code(s) to assign when phrases like "being able" appear in a successful aging narrative. For this example, it is important to distinguish the context of "being able" as having an opportunity to do something, from being capable of doing something. We have addressed questions such as this, and invite interested persons to inquire about The Manitoba Follow-up Study coding manual and accompanying rule book via the MFUS website at www.mfus.ca.

When interpreting stable or changing prevalence of a theme over time it is important to recognize that both the numerator (number of men with the theme on their survey) and denominator (number of men who returned a survey with a definition of successful aging) define the prevalence. We know that the denominator is declining with each successive survey, almost entirely because of attrition due to death. If a prevalence rate is stable over time, the number of men reporting a theme on their definitions (the numerator) is declining at the same rate as the number of men dying in the cohort (the denominator). If a prevalence rate is declining over time, the number of men with the theme in their definitions is declining at a rate greater than the rate of death in the cohort. Such scenarios could arise for two reasons: possibly those with the theme are dying at a greater rate than those without the theme in their definition, or, those reporting the theme earlier in time are alive, but are omitting the theme from their definition later in time. Both these circumstances merit further investigation.

With regard to the successful aging themes that significantly decreased in prevalence over time, we might expect from a psychological perspective that *Leisure Activity and Interests; Happiness; Attitude; Health–General; Physical Activity; Being Productive or Contributing; and Life Experience* would be mentioned less often as time progressed. In 1996, the mean age of the study members was 76 years. It could be that as the study members aged, they were more successful at coping with age-related losses in health and functional ability. This would explain why, over time, they mentioned *Leisure Activity and Interests; Health–General; Physical Activity; Being Productive or Contributing;* and *Life Experience* less often in their successful aging definitions. Their responses suggest that they felt less and less that health and functional ability were necessary parts of successful aging. Similarly, *Happiness* and *[Positive] Attitude* may have been mentioned progressively less often as being important for successful aging, since presumably by age 76 and over, individuals have already come up with ways to be happy and to keep positive. Hence, these matters do not come to mind when asked for definitions of successful aging.

The increase in prevalence of the *Living and Dying* theme has a potential explanation that fits well with the explanation given for the themes that were found to prospectively decrease. In particular, it could be that *Living and Dying* was highlighted as progressively more important for successful aging, since as the study members aged, survival was more and more on their minds. In psychological terms, this could mean that the surviving study members had not yet been able to come to terms with and accept the idea that some day they were going to die. This is not an unreasonable surmise, since adjusting to and accepting the notion of inevitable oncoming death is not an easy concept for many of us. This interpretation is supported by the increasing prevalence of the *Coping, Adjustment, Acceptance* theme over time. It is conceivable that part of what the members were coping with, adjusting to, and trying to accept could be the inevitability of their eventual demise.

Regarding the themes that remained unchanged in prevalence over time, it makes sense that *Independence; Health–Physical; Relationships–Companionship; Adaptation; Lifestyle; Health–Cognitive; Relationships–Society; Spirituality/Faith; Health System; Quality of Life;* and *Relationships–Intimate* retained the same level of importance in terms of success at aging over time. Notably, the *Independence* theme was most prevalent during the 11-year period examined, being mentioned approximately 25% of the time in any given survey year. This is not surprising, since maintaining one's independence and autonomy seems intuitively important for successful aging. On the other hand, equally important is the finding that 75% of the study members did not mention *Independence* as part of their successful aging definitions during the time period examined. This translates into three of every four men not mentioning activities like being able to drive, climb stairs, or getting around by themselves as being important for successful aging. There are at least two potential explanations for the omission of

Independence in a man's successful aging definition. One is that perhaps most of the individuals who failed to mention *Independence* were still independent at the times they were surveyed, and they took their independence for granted. Another potential explanation is that perhaps by omission, three out of four men of our surviving cohort were telling us that activities like driving, climbing stairs, and getting around by themselves were really not that important for successful aging at their stage of life. Rather, the omission of the *Independence* theme, taken together with the increase of the *Living and Dying* and the *Coping, Adjustment, Acceptance* themes, suggests that once older men reach very late life, they may be progressively more concerned with issues surrounding life and death than they are with remaining independent. This interpretation is consistent with the call to move from focusing primarily on the biomedical aspects of successful aging, to looking at psychosocial factors as well (Depp & Jeste, 2006; Young et al., 2009). To the extent that these findings are generalizable to the population at large, this interpretation has policy implications. Specifically, our findings suggest that rather than focusing many of our available resources on endeavors like constructing age-friendly communities, in which we try to improve environmental conditions for younger seniors so that they can continue to function independently (Menec, Means, Keating, Parkhurst, & Eales, 2011), we may want to reconsider the allocation of some of our resources toward trying to help very old, presumably frail individuals come to terms with and accept the inevitable end of life. Perhaps once the body starts to physically fail, it becomes progressively more important to try to help the individual inside.

Perhaps the greatest strength of our analysis is the use of the longitudinal successful aging narratives, which made it possible for us to explore trends in prevalence of successful aging themes derived from close to 6,000 lay definitions of successful aging over an 11-year timeframe. Our lay definitions came from community dwelling older men, some of whom may have only contributed one definition, and others up to six definitions, for our analysis. All lay definitions written on these surveys contributed to the development of our coding system, whether they were from a man who was in good health or poor, or from a man who had reported having aged successfully, or not. Hence, the effect of selective attrition on the potential for missing some themes over time is likely minimal.

Past research has considered successful aging narratives longitudinally, but the cohort sizes in those studies were notably smaller (Phelan et al., 2004). The present study answers the call for large-scale longitudinal narrative-based research in the area of successful aging. Our presentation of the themes from lay definitions of successful aging are derived from a select group of men who were born in a fairly narrow range of years, lived in Canada most all of their lives, served in the Royal Canadian Air Force during the years of World War II, and survived to at least 1996. These men characterize a very unique cohort. Hence, the potential effects of shared experiences throughout their lives may call into question whether the present results are unique to them, that is, characterize a cohort effect,

or whether the results we present could be generalizable to other populations. Many, if not most, of the themes reported in our present analysis certainly seem to be generalizable. For instance, the themes of physical and mental health, independence, relationships, and others, are not unique to the MFUS cohort, having been reported by others (Bowling, 2007; Phelan et al., 2004). What might be specific to the men of our cohort are certain thematic examples in the category of *Life Experiences*. For example, our LE3 sub-theme is specific to military service. This supports our coding system being readily adaptable to incorporate new themes or sub-themes specific to other cohorts' themes that may not have been mentioned by the MFUS men.

The composition of the MFUS cohort being limited to men only can be seen as both a strength and a limitation of the present study. Narrative research is typically not conducted on men only, presumably since men have not historically been considered as communal as women (Helgeson, 1994). MFUS has been successful in the collection of considerable narrative data over time, providing rare insight into older men's views of successful aging.

While we acknowledge that different themes may emerge from women's self-definitions of successful aging than from men's, there is no evidence in the literature to suggest that gender differences in themes from self-definitions of successful aging exist. Had previous research been able to empirically compare the themes from self-definitions of men versus women, young versus old individuals, or people of different cultures, we feel confident that many of the themes that would emerge would be the same as those already captured by the MFUS coding system. Aging is, after all, part of the human condition.

With regard to any new themes that may emerge, our coding system was designed to be flexible enough to accommodate new themes in our own cohort and in others as they might arise, without having to start the coding process over again from the ground up. As Creswell (1994, p. 159) points out, in qualitative case study research in which the goal is to examine replicability in different contexts, "one can examine whether the same . . . thematic constructs are replicated in different settings." Yin (1989) took this idea even further by strongly advising qualitative researchers to report a detailed protocol for data collection, so as to allow their procedures to be replicated in different settings.

The use of narrative inquiry has previously been questioned as an appropriate methodology due to its subjectivity (Manchester Metropolitan University, 2008). However, the use of narrative inquiry methodology in our work constitutes a definite strength, since lay definitions of successful aging are currently thought to be much more complete than researcher-defined models (Bowling, 2007). Previous work in this field suggests that the best way to find out what older people think about successful aging is to ask them.

We reported an analysis of the first successful aging questionnaire administered to the male MFUS cohort in 1996 (Tate et al., 2003). In that contribution we described a small set of broad themes that were provided in lay definitions of

successful aging, analyzed how the themes were interrelated, and explored how characteristics of the respondents were related to the presence or absence of a theme in their definitions. Since then, the "Successful Aging Questionnaire" has been repeated, now 11 times over 15 years, using the same methodology. We have continued to mail the same core questions to the surviving members of the cohort, and have repeatedly asked for a written narrative of their definition of successful aging. Early in our repeat surveys, we wanted to establish whether our methodology was appropriate, that is, whether the written narratives the men provided were consistent in their themes of successful aging over time. To address this concern, we developed a sub-study within the ongoing study, and sent our questionnaire to the men twice over a 30-day time period. Our manuscript (Tate et al., 2009) describes the design and results of that sub-study wherein we provide evidence that indeed the respondents are consistent in their written narratives, thus providing supportive evidence for the mailed survey with the written narrative methodology. Both of these manuscripts, and what we have learned about the dynamic process of successful aging since 1996, have led to the present article. We are confident that this more detailed coding system, compared to that described in our initial article, will better support research in this field. The unique contributions of the present manuscript are twofold: the breadth of the sub-themes that have been provided by this cohort; and the empirical description at the population level of the variation in prevalence of the themes over time.

We have no intention of proposing or endorsing a universal definition of successful aging to the research community, nor do we feel that a definition should be proposed. The results of our work support the notion that successful aging is a diverse and dynamic process with seemingly many dimensions. We hope that the coding system presented herein can be adopted as a basis for describing themes from lay definitions of successful aging obtained by other researchers with other study populations. For instance, it might be valuable to apply our coding system to the successful aging definitions of older women, perhaps the MFUS study members' wives, to see how older women's views on successful aging compare to those of older men. An application of the MFUS coding system to narrative data obtained from people of other nationalities or cultures, to explore variation in distributions of their themes of successful aging, would be interesting and informative from a policy planning perspective. A common system for coding lay definitions of successful aging can only improve our understanding of successful aging as articulated through the voices of older individuals. We invite interested persons to inquire about The Manitoba Follow-up Study coding manual and accompanying rule book via the MFUS website at www.mfus.ca

In this study, we undertook population-level analyses aimed at investigating trends in prevalence of themes generated from older men's lay definitions of successful aging. We found that the prevalences of some successful aging themes decreased, others increased, while some remained unchanged over time.

We are now free to explore hypotheses at the individual level. Future research may involve examining themes or replication of themes in relation to sustained or improved physical or psychological well-being, and/or disability-free survival, at the individual level.

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