



Themes from older men's lay definitions of successful aging as indicators of primary and secondary control beliefs over time: The Manitoba Follow-up Study[☆]

Audrey U. Swift^{*}, Robert B. Tate

Manitoba Follow-up Study, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba, Canada

ARTICLE INFO

Article history:

Received 24 July 2013

Received in revised form 4 September 2013

Accepted 24 September 2013

Keywords:

Successful aging

Primary control

Secondary control

Control beliefs

Prevalence

Trends in prevalence

Lay definitions

Narratives

ABSTRACT

Constructs of control have theoretically been equated to successful aging in the psychology literature. Hence, we used themes from lay definitions of successful aging to quantify the prevalence of primary and secondary control beliefs over time. In doing so we hoped to shed new light upon the virtually uncharted area of older men's primary and secondary control beliefs over time. Using successful aging narratives spanning a 10-year timeframe from the Manitoba Follow-up Study cohort, we mapped themes from older men's lay definitions of successful aging onto Rothbaum, Weisz, and Snyder's (1982) constructs of primary and secondary control. We then examined the prevalence of the constructs of control over 10 years and found that some men emphasized primary control, some emphasized secondary control, and others emphasized both, prospectively. Counter to what had previously been theorized, many older men continued to emphasize primary control as important well into late life. As expected, secondary control became more important with age. Furthermore, among those men who endorsed both primary and secondary control, significantly more men switched emphasis from primary to secondary control beliefs as they aged. This finding supported Rothbaum et al.'s (1982) surmise that individuals could switch from one type of control to another, presumably as life circumstances dictated. Knowing which types of control beliefs older men emphasize as they age has theoretical and practical implications. Theoretically, it sheds new light on the under-researched area of control beliefs in older men. Practically, it is informative for anyone interested in enhancing older men's perceptions of control in very late life, particularly in the face of otherwise uncontrollable age-related decline and imminent demise.

© 2013 Elsevier Inc. All rights reserved.

Introduction

Perceived control permeates virtually all aspects of life (Lachman, Neupert, & Agrigoroaei, 2011) and is widely accepted as a strong contributor to individual health and well-being (Skinner, 1996). Perceived control takes many

different forms, one of which is Rothbaum, Weisz and Snyder's (1982) two-process model of control. In the two-process model, Rothbaum and colleagues theorized that people gained feelings of control in primarily two ways: by taking direct action to change the environment to align it with their wishes (*primary control*) and by psychologically adapting to negative situations and events such as age-related decline, so as to come to terms with and accept them (*secondary control*). Along with recognizing secondary control as valuable in its own right, Rothbaum et al. (1982) posited that secondary control came about when attempts at primary control failed, suggesting that individuals could switch between primary and secondary control in response to changing life circumstances.

[☆] This research was supported by a Manitoba Health Research Council (MHRC) Postdoctoral Fellowship to the first author.

^{*} Corresponding author at: T148-770 Bannatyne Avenue, University of Manitoba, Winnipeg, MB R3E 0W3, Canada.

E-mail address: Audrey.Swift@med.umanitoba.ca (A.U. Swift).

In an extension of Rothbaum et al.'s (1982) work, Schulz and Heckhausen (1996) equated control with successful aging. These authors emphasized the “primacy of primary [over secondary] control” (Heckhausen & Schulz, 1995, p. 285) implying that the role of secondary control in relation to primary was purely compensatory, and positing that primary control decreased while secondary control increased in late life in response to presumably adverse circumstances like age-related decline. That said, short of discussing control in terms of “high” and “low”, Schulz and Heckhausen's (1996) lifespan model of successful aging did not quantify the degree to which individuals relied on primary or secondary control over the life course, it did not address Rothbaum et al.'s switching hypothesis, nor did it acknowledge that men could potentially gain perceptions of control differently than do women. To address these gaps in the literature, in the present study we mapped themes from the successful aging definitions of a long-term cohort of older men onto Rothbaum et al.'s two-process model of primary and secondary control. To the extent that successful aging can be equated with control (as per Schulz & Heckhausen, 1996), the mapping procedure allowed us to test the extent to which older men endorsed primary or secondary control beliefs or both prospectively in late life.

Objective 1 of the present study was to examine the trend in prevalence of older men's primary control beliefs over a 10-year period of time between 1996 and 2006. Objective 2 was to examine the trend in prevalence of older men's secondary control beliefs over the same period of time. Objective 3 was to look at the trend in prevalence of both types of control together over the 10 year period considered. Knowing how older men perceive control in later life will not only be informative for researchers, health care professionals, and others seeking to enhance older men's ability to age successfully in later life, it will also likely benefit older men themselves.

Primary control, health, and well-being

Much empirical evidence exists in support of the relationship between what Rothbaum et al. (1982) termed “primary control” and physical and psychological well-being. Primary control and related constructs (e.g., “perceived control”; Skinner, 1996) have been shown to relate to physical health outcomes such as decreased risk of becoming disabled or dying (Infurna, Gerstorf, Ram, Schupp, & Wagner, 2011; Surtees et al., 2010), increased functional health status (Chiu & Spencer, 2009), quicker recovery from open-heart surgery (Barry, Kasl, Lichtman, Vaccarino, & Krumholz, 2006), proper nutrition (Biela & Pajak, 2005), decreased asthma symptom severity (Calfee, Katz, Yelin, Iribarren, & Eisner, 2006), dialysis adherence (Cvengros, Christensen, & Lawton, 2004), and better pain management (Yates et al., 2004).

Psychological well-being outcomes linked to primary control include increased quality of life (Hernandez-Tejada, Lynch, Strom, & Egede, 2012; Peters & Sellick, 2006), decreased depression (Abramson, Seligman, & Teasdale, 1978; O'Rourke et al., 2010), lower stress (Folkman, 1984; Roberts, Dunkle, & Haug, 1994), cognitive adaptation (Thompson et al., 1998), happiness (Tong et al., 2005), greater positive affect, less negative affect, and general emotional well being (Bye & Pushkar, 2009; Kunzmann, Little, & Smith, 2002).

Secondary control, health, and well-being

Similar to primary control, secondary control has been linked to physical health outcomes such as fewer days limited by pain (Tennen, Affleck, Urrows, Higgins, & Mendola, 1992), lower morbidity and decreased risk of subsequent heart attack (Affleck, Tennen, Croog, & Levine, 1987), lower visual impairment due to macular degeneration (Boerner, Brennan, Horowitz, & Reinhardt, 2010), improved physical functioning over time (Pargament, Koenig, Tarakeshwar, & Hahn, 2004), decreased perceived illness severity (Walker, Lindner, & Noonan, 2009), increased perceived health (Sears, Stanton, & Danoff-Burg, 2003), increased health-related quality of life (Windsor, 2009), and better metabolic control over diabetes (Jaser & White, 2011).

Although secondary control has been linked to improved physical health outcomes, most research thus far has found secondary control and related constructs (such as positive reappraisal) to be significantly related to measures of psychological well-being, such as greater post-traumatic psychological growth in cancer patients (Schroevers, Kraaij, & Garnefski, 2011), greater coping effectiveness in terms of somatic life events (Garnefski & Kraaij, 2009), decreased anger (Bormann & Carrico, 2009), greater benefit-finding (Harrington, McGurk, & Llewellyn, 2008), decreased perceived stress (Lequerica, Forchheimer, Tate, Roller, & Toussaint, 2008), decreased depression (Braam et al., 2008; Garnefski, Teerds, Kraaij, Legerstee, & van den Kommer, 2003; Kraaij & Garnefski, 2006), increased life satisfaction (Büssing, Fischer, Ostermann, & Matthiessen, 2008), decreased causal uncertainty about personal outcomes, decreased negative affect (Tobin & Raymundo, 2010), higher perceived controllability (Cheng et al., 2012), increased sense of control (Chipperfield et al., 2012), and increased meaning in life (Park, Malone, Suresh, Bliss, & Rosen, 2007).

Secondary control in conditions of low primary control

According to Rothbaum et al. (1982), individuals gain and maintain perceptions of control via two processes, primary and secondary control. In brief, primary control can be thought of as taking direct action to change the world in accordance with one's wishes. In contrast, Rothbaum and colleagues defined secondary control as psychological adaptation in the face of otherwise uncontrollable situations and events. In their seminal article of 1982, Rothbaum et al. identified four sub-types of secondary control: interpretive, vicarious, illusory, and predictive control. Interpretive control was defined as gaining feelings of control through positive reinterpretation and acceptance. For example, an older man may “see the bright side” in response to the aging process, perhaps by believing that “with age comes wisdom”. Vicarious control was said to involve associating with powerful others, such as family or friends. Illusory control was theorized to involve beliefs in luck, fate, or chance; and predictive control involved knowing about an upcoming negative life event (such as moving to a personal care home), so as to better psychologically prepare for it and avoid disappointment. Rothbaum et al. (1982, p. 7) further suggested that individuals could switch from primary to secondary control in response to the objectively uncontrollable conditions imposed by circumstances like age-related decline, and that “knowledge of how and when to exert the two processes of control and how to integrate them” (p. 30) was “one of the most significant implications of the two

process model” (p. 29). Although Rothbaum and colleagues considered knowing when to switch from primary to secondary control to be a critical component of psychological adaptation in environmental conditions that were not directly controllable, their switching hypothesis has to date received only limited research attention, and only in the area of educational psychology (Hall, 2006, 2008). Furthermore, neither the two-process model of control (Rothbaum et al., 1982) nor the lifespan theory of successful aging (Schulz & Heckhausen, 1996) considered the possibility that older men could endorse control beliefs differently than did older women, a prospect suggested by Swift, Bailis, Chipperfield, Ruthig, and Newall in 2008.

Age and gender differences in control

In addition to being linked to health, well-being, and successful aging, some evidence of age and gender differences in primary and secondary control has been found. In terms of age differences, primary control has been shown to be more adaptive for the young–old, whereas secondary control is more adaptive for old–old individuals (e.g., Chipperfield, Perry, & Menec, 1999; Heckhausen & Schulz, 1995). In terms of gender differences, limited evidence suggests that older men may endorse primary control to a greater degree than do older women, whereas older women may endorse secondary control more or differently than do older men (Chipperfield, Perry, Bailis, Ruthig, & Chuchmach, 2007; Chipperfield et al., 1999; Swift et al., 2008). That said, most prior studies of control have focused on older women (e.g., Johnson & Barer, 1993). Not much is known about control beliefs in older men.

This gap in the control literature is highlighted in the work of Swift et al. (2008) which suggested that older women used secondary control beliefs to compensate for decreased life satisfaction and positive emotion when faced with serious health problems, whereas older men benefitted from secondary control beliefs while still healthy. Unfortunately, sample size was an issue in the 2008 study, and it was not possible to further investigate the adaptive influences of secondary control beliefs in the older men of the sample. One potential explanation for the healthy men's endorsement of the secondary control beliefs and their related high life satisfaction may stem back to Rothbaum et al.'s (1982) theoretical work, which suggested that in addition to endorsing secondary control when attempts at primary control failed, secondary control could be valuable in its own right. Nonetheless, in the present study our broad objective was to narrow the gap in the control literature on older men by exploring their control beliefs over time in a long-term cohort. Knowledge of how older men perceive control in the final quarter of their lives has important theoretical and practical implications: theoretically, it extends contemporary thinking on control; practically, it may serve to enhance the successful aging process in older men.

Method

In light of past theoretical work equating control to successful aging (Schulz & Heckhausen, 1996) we mapped themes from older men's lay definitions of successful aging onto Rothbaum et al.'s primary and secondary control. In particular, using the inaugural version of the Manitoba Follow-up Study Successful Aging Coding Manual (Tate, Swift, & Bayomi, 2013) we assigned

thematic codes to older men's lay definitions of successful aging, and then conceptually mapped the themes from the definitions onto Rothbaum et al. (1982) primary and secondary control. Based on previous theory in the field to suggest that primary control decreased while secondary control increased with age (Schulz & Heckhausen, 1996), we expected the men's emphasis on primary control beliefs to decrease over the 10 years considered (Hypothesis 1), and the men's endorsement of secondary control beliefs to increase over the same period of time (Hypothesis 2). Based on Rothbaum et al.'s (1982) hypothesis that people could switch from one type of control to the other in accordance with life circumstances, we expected the men's emphasis to switch from primary to secondary control with age (Hypothesis 3).

The Manitoba Follow-up Study cohort

Our study sample was made up of a cohort of older men from The Manitoba Follow-up Study (MFUS), one of the longest-running studies of health and aging in the world. MFUS began with a cohort of 3983 healthy young male aircrew recruits from the Royal Canadian Air Force on July 1, 1948. It was designed to study the prognostic significance of abnormalities identified on routine electrocardiograms for subsequent cardiovascular disease (Mathewson, Manfreda, Tate, & Cuddy, 1987). For the past 65 years, the majority of the surviving MFUS members have completed contact questionnaires and requests for routine medical examinations. In the spring of 1996, when the mean age of the 2043 surviving MFUS members was 78 years, MFUS researchers recognized the importance of studying successful aging, and expanded their research focus towards that end (Tate, Lah, & Cuddy, 2003). The Successful Aging Questionnaire (SAQ) was developed to examine the characteristics of successful aging among the cohort, details of which are described elsewhere (Tate et al., 2003). The core SAQ, a nine-page mail-in questionnaire, included measures of living arrangements; physical, mental and social functioning; activities of daily living; the SF-36; retirement; and successful aging. The survey concluded with the open-ended question, “What is YOUR definition of successful aging?” from which we obtained the lay definitions of successful aging for the purposes of the present study. The SAQ was mailed in April of 1996 and after two reminders, was returned by 89% of the MFUS members. Of the 89%, 1745 community-dwelling individuals provided narrative responses to the open-ended successful aging questions. Subsequent SAQs were mailed to the MFUS cohort in the spring of 2000, 2002, and have been mailed annually since 2004. Once the first wave of SAQs had been returned in 1996, a content analysis was performed on the responses to the open-ended successful aging question as described in Tate et al. (2003). Successive surveys since then have led to the development of the MFUS coding system, which today has evolved to include 86 themes. Throughout this paper we refer to the coding system as the “MFUS Successful Aging Coding Manual – Version 1” (MFUS-SA-CM v.1; Tate et al., 2013).

Conceptual methods: mapping successful aging themes onto constructs of control

The thematic categories in the MFUS-SA-CM v.1 illustrate that consistent with previous research on successful aging,

broad categories of health and well-being were reported by the MFUS men, as reflected in themes of physical health, mental health, independence, quality of life, social networks, and spirituality. In keeping with Schulz and Heckhausen's (1996) work equating control to successful aging, the 86 thematic codes from the MFUS-SA-CM v.1 that had been assigned to MFUS members' lay definitions of successful aging were mapped onto primary and secondary control by A. Swift, who studied Rothbaum et al.'s (1982) constructs of control while completing both her Master's thesis and her doctoral dissertation (Swift, 2004, 2010). Dr. Swift found that each of the 86 themes from the successful aging definitions fell into one of five sub-categories of control, sub-categories that were created based upon the amount of control MFUS members could potentially perceive over the aspects of life mentioned in their successful aging definitions. The five sub-categories of control were *Primary* and *Secondary control proper*, *Limited primary* and *Limited secondary control*, and *Pertinent to primary control*. The illustrative examples in the paragraphs that follow were borrowed from Tate et al. (2013), more of which are available upon request from the corresponding author.

Primary control proper

Many of the themes from the MFUS members' lay definitions of successful aging mapped onto primary control proper in that the themes indicated having taken some sort of direct action towards aging successfully. For example, some MFUS members reported that they had stayed active, kept up their interests, gotten lots of exercise, maintained their independence, remained productive members of society, ate right, and drank two glasses of red wine each day in the interest of aging successfully. According to Rothbaum et al. (1982), taking direct action in these ways exemplifies primary control proper.

Limited primary control

A number of the themes from our MFUS members' successful aging definitions mapped onto primary control to a lesser degree, in that they depicted areas of life over which the MFUS members did not have as much direct control. For instance, MFUS members mentioned being healthy, being of sound mind, being physically capable, and being able to communicate in their definitions of successful aging. Since these aspects of life are not completely directly controllable (particularly in the face of age-related decline), they were categorized as *Limited primary control*.

Pertinent to primary control

Four of the MFUS-SA-CM v.1 themes from our older men's successful aging definitions were pertinent to primary control in that they were instrumental to taking direct action so as to age successfully. However, these four themes represented life circumstances that could not be directly controlled by the MFUS men. For example, some successful aging definitions included not having mental illness, not being handicapped, reaching old age, and dying quickly. Although these aspects of life are for the most part not directly controllable, they are nonetheless instrumental to primary control in that without them, taking direct action (i.e., exerting primary control) would be considerably more difficult. In light of Heckhausen and Schulz's (1995) notion of the primacy of primary (over secondary) control, we felt it important to include the *Pertinent*

to primary control category in our five-part control classification scheme.

Secondary control proper

A number of the 86 MFUS-SA-CM v.1 themes that had been assigned to MFUS members' lay definitions of successful aging mapped onto Rothbaum et al.'s (1982) secondary control in that they indicated positive reinterpretation (interpretive control); association with powerful others (vicarious control); belief in luck, fate, or chance (illusory control); or ability to predict upcoming negative events (predictive control) in the interests of aging successfully. For example, some MFUS members reported "seeing the bright side" (interpretive control); associating with family or friends (vicarious control); believing that they had been lucky (illusory control); or planning for future support/assistance (e.g., preparing to eventually enter assisted living; predictive control) so as to come to terms with and accept the otherwise uncontrollable process of getting older. Rothbaum et al. considered psychological adaptation processes such as these to be secondary control proper.

Limited secondary control

Several of the MFUS-SA-CM v.1 themes mapped onto secondary control to some degree in that they depicted areas of life over which MFUS members had limited degrees of psychological control. For example, although some members mentioned having virtues, having dignity, and being less stressed or worried as being important for successful aging, these aspects of the self are thought to be partly hereditary (Tellegen et al., 1988) making them difficult to control psychologically. For this reason they were classified as *Limited secondary control*.

Both primary and secondary control

The open-ended nature of the MFUS narrative data made it possible for each study member's successful aging definition to be assigned one or more themes. In other words, any given successful aging narrative could potentially include only primary control themes, only secondary control themes, or both. An example from our narrative data of a successful aging definition that included both primary and secondary control themes was, "I go for regular medical check-ups [primary control] and I don't worry about the things I can't change [secondary control]" (Tate et al., 2013). In light of the possibility of the occurrence of both primary and secondary control themes being included in a given narrative, we created a "Both" category for the purposes of our quantitative analyses. The "Both" category was intended to capture individual definitions of successful aging that included thematic codes for both primary and secondary control. Classifying the themes from individual successful aging definitions into categories of primary control, secondary control, or both made it possible to empirically examine the prevalence and trends in prevalence of the categories of control our older male MFUS members had included in their successful aging definitions over the ten-year time period considered.

In summary, the conceptual overlap between the MFUS-SA-CM v.1 successful aging themes and Rothbaum et al.'s (1982) constructs of control made it possible to use the MFUS-SA-CM v.1 as a classification taxonomy for the references to primary and secondary control that appeared in our older men's successful aging definitions. To the extent that, as suggested by Schulz and Heckhausen (1996), successful aging definitions

can be used to represent constructs of control, this classification taxonomy made it possible to empirically examine the prevalence and trends in prevalence of older men's perceptions of primary and secondary control over time.

Statistical methods: prevalence and trends in prevalence of control beliefs over time

The 86 MFUS-SA-CM v.1 successful aging themes from five Successful Aging Questionnaires spanning the years 1996, 2000, 2002, 2004, and 2006 were used for this analysis. The SAS 9.2 Proc FREQ procedure was used to examine the prevalence of the MFUS men's perceptions of primary or secondary control or both over nine age categories. Specifically, frequency counts were performed on the MFUS-SA-CM v.1 thematic codes that had originated from the MFUS men's lay definitions of successful aging that represented primary or secondary control or both at two-year age intervals, when the men were between 74 and 88 years old. The SAS 9.2 Proc GLIMMIX procedure was then used to develop generalized linear regression models for binary outcomes (presence or absence of primary or secondary control) to examine trends in prevalence of primary or secondary control beliefs or both over time, while adjusting for multiple (up to five) surveys from one man.

Results

Conceptual findings: mapping successful aging themes onto constructs of control

In careful consideration of our older men's lay definitions of successful aging and of Rothbaum et al.'s (1982) definitions of

primary and secondary control, we found that each of the 86 MFUS-SA-CM v.1 themes fell into one of our five categories of control. In keeping with Heckhausen and Schulz's (1995) notion of the "primacy of primary [over secondary] control", the overall *Primary control mapping* category included not only those successful aging narratives indicative of MFUS members having taken direct action to age successfully (*Primary control proper*; $n = 32$ themes), but also narratives indicating members' *Limited primary control* ($n = 19$ themes) and mentions of aspects of life that were *Pertinent to primary control* ($n = 4$ themes; see Table 1).

In contrast, the overall *Secondary control mapping* category included narratives indicating psychological adaptation to the aging process via one of Rothbaum et al.'s four types of secondary control (*Secondary control proper*; $n = 24$ themes). Also included in the *Secondary control mapping* category were aspects of life over which MFUS members had *Limited secondary control* ($n = 7$ themes; Table 2). In keeping with Rothbaum et al.'s (1982) two-process model of control and the "switching" hypothesis, we retained the two main mapping categories of primary and secondary control and the "Both" category for our quantitative analyses.

Empirical results: prevalence and trends in prevalence of control beliefs over time

Counter to our theoretically-based expectation in Hypothesis 1 (i.e., that primary control would decrease in later life), the frequency of occurrence of the primary control themes across the nine two-year age intervals remained constant at approximately 40% (see Fig. 1). That said, among those men whose successful aging definitions included themes of secondary

Table 1

Primary control mapping: themes from older men's lay definitions of successful aging that conceptually mapped onto primary control ($n = 55$).

Primary control proper ^a ($n = 32$)		
Health care provider	Taking medication	Education/career
Having served in the war	Having/accomplishing goals/making plans	Assistive devices
Moderation/accommodation	Being productive/useful	Contributing/helping family
Contributing/helping friends	Volunteering	Donating to charity
Keeping physically fit/working out	Keeping physically active	Participating in sports
Golfing	Activity/interests/hobbies	Keeping active
Pursuing interests	Performing mental activities	Healthy nutrition
No smoking/drinking/drugs	Smoking/drinking in moderation	Healthy lifestyle choices
Independence – autonomy	Independence – make own decisions	Independence – independent living
Independence – instrumental activities	Independence – basic activities	Independence – mobility
Independence – driving/flying	Independence – financial	
Limited primary control ^b ($n = 19$)		
Being healthy	Having few health problems	Absence of illness/sickness
Gradual deterioration	Good physical health	No/minimal physical disease/impairment
Physical functional ability	Feeling healthy/energetic	Memory
Mind	Ability to communicate	Minimal/no health care required
Not aging	Staying alive	Comparative age
Being retired	Good lifestyle	Basic needs provided
Getting support when needed		
Pertinent to primary control ^c ($n = 4$)		
Not having disabilities	Not having mental illness	Reaching old age
Dying quickly		

^a MFUS members defined successful aging in terms of taking direct action (i.e., Rothbaum et al., 1982 primary control).

^b MFUS members defined successful aging in terms of aspects of life over which they had limited degrees of direct (primary) control.

^c MFUS members defined successful aging in terms of aspects of life that were pertinent to having direct (primary) control.

Table 2Secondary control mapping: themes from older men's lay definitions of successful aging that mapped onto secondary control ($n = 31$).

Secondary control proper ^a ($n = 24$)		
Positive attitude	Having good fortune	Don't think about aging
Thinking young	Being thankful	Knowing offspring are doing well
Coping with personal stressors	Coping with family/friend's declining health/death	Adjusting to wife's/friend's declining health/death
Accepting changing body	Accepting the "natural progression" of life	Accepting wife's/friend's declining health/death
Loving spouse	Relationships with family	Companionship/belonging – non-specific
Friendships/neighbors	Animal companionship	Intimate relationships
Keeping active socially	Interest in/ties to the community/world	Being spiritual/having faith
Sense of purpose	Planning for future support/assistance	Sense of meaning and purpose
Limited secondary control ^b ($n = 7$)		
Having virtues	Having dignity	Sense of humor/worth
Enjoying/having an interesting life	Less stress/worry	Content/satisfied/comfortable with self
Living one day at a time		

^a MFUS members defined successful aging in terms of psychological adjustment as per Rothbaum et al. (1982) four types of secondary control (i.e., positive reinterpretation; beliefs in powerful others; beliefs in luck, fate, or chance; or ability to predict upcoming negative events).

^b MFUS members defined successful aging in terms of aspects of life that afforded them limited degrees of psychological adjustment/secondary control.

control, secondary control was found to significantly increase with age (Hypothesis 2). Furthermore, among those men whose definitions included *both* primary and secondary control (approximately 60%), significantly more men switched emphasis from primary to secondary control with age (Hypothesis 3; Fig. 1). The corresponding odds ratio of 1.03 (95% CI = 1.01, 1.04) implied that with each one-year increase in age, the odds of a secondary control theme appearing in a man's successful aging definition increased by 3%.

Discussion

Our conceptual findings supported the theory that constructs of control are implicit in successful aging (Schulz & Heckhausen, 1996) and as such, we employed lay definitions of successful aging to quantify the prevalence of older men's

primary and secondary control beliefs over time. Consistent with past research on combinations of control performed on samples consisting of mainly older women (Swift & Chipperfield, 2013) our empirical findings suggest that some older men emphasize primary control, some emphasize secondary control, and others emphasize both as they age. In terms of the prevalence and trends in prevalence of control beliefs over time, counter to our theoretically-based expectation that primary control would decrease in late life, primary control (or taking direct action) remained vital for many MFUS men as they aged. Additionally, we found that the number of men whose lay definitions of successful aging included secondary control themes increased over time, and that among those men who endorsed *both* primary and secondary control, significantly more of them switched emphasis from primary to secondary control over time. Knowing older men's control

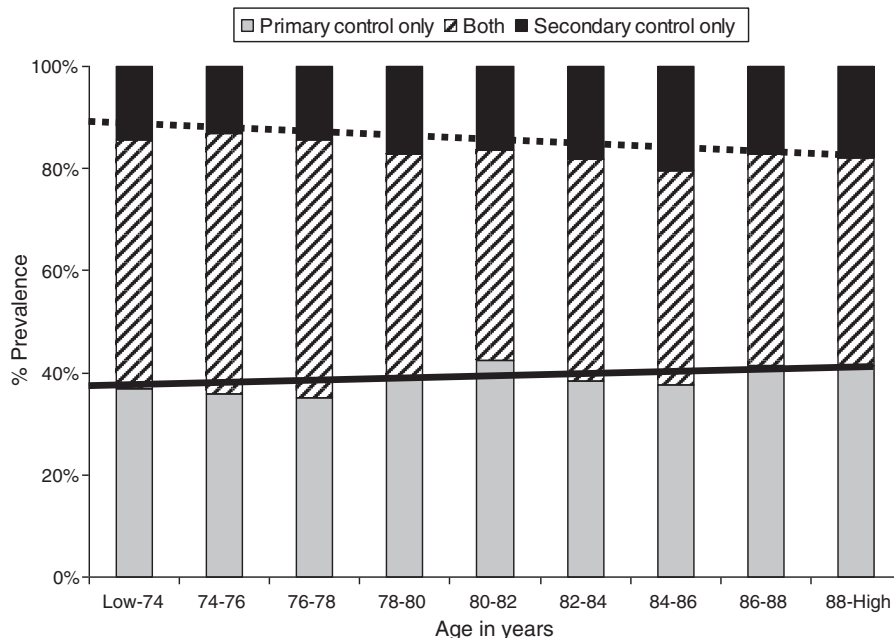


Fig. 1. Prevalence and trends in prevalence of older men's control beliefs as they age.

belief trajectories could provide a starting point for “widen [ing] their net of control” (Lachman et al., 2011, p. 185), and could enhance older men’s capability to age successfully at a time when many face otherwise uncontrollable age-related decline and imminent demise.

Conceptual findings

Little is known about primary and secondary control beliefs in older men, much less very old men. This gap in the control literature may exist partly because older men generally do not live as long as older women (Austad, 2006) hence, they are not as readily available for study; or it may be because of gender stereotypes that influence individual beliefs and behavior. That is, men are stereotypically expected to be “strong, silent types”, keeping information of a personal nature to themselves, and not expressing much emotion (Bennett, 2007). This scenario differs from that of women, who are stereotypically expected to be more communal, and open with their feelings (Bennett & Vidal-Hall, 2000; Helgeson, 1994). Such gender stereotypes may explain why it can be difficult to collect narrative data about the inner world of older men. Older cohorts of men, having grown up in a different social climate than many of us, may be particularly more likely to ascribe to gender stereotypes and may tend to keep sensitive information (such as the types of control they rely on) to themselves. That being said, since control beliefs can be equated to successful aging (Schulz & Heckhausen, 1996), sensitive information such as this can be gleaned from different dialogs, such men’s answers to presumably “safer” questions such as, “What is YOUR definition of successful aging?”

The difficulty in measuring the inner world of older men highlights the utility of being able to map themes from older men’s successful aging definitions onto constructs of control, a task that in our case could only have been accomplished by using the MFUS-SA-CM v.1 as a classification system. That we were successful in mapping themes from lay definitions of successful aging onto Rothbaum et al.’s constructs of control supports the theoretical notion that control can be equated to successful aging. It also highlights the potential utility of the coding system as a classification taxonomy for mapping themes from lay definitions of successful aging from other subgroups of the population onto other control paradigms, a purpose that could benefit researchers who are interested in testing theories of psychological control, but who do not have the primary data with which to do so.

Empirical findings

In the present study, once the 86 MFUS-SA-CM v.1 successful aging themes had been mapped onto Rothbaum et al.’s constructs of control, it was then possible to empirically examine the prevalence and trends in prevalence of primary and secondary control beliefs and both over time. We sought to do so in light of the gap in the literature on primary and secondary control beliefs in older men. Surprisingly, our findings suggested that contrary to what had previously been thought in Fig. 2 of Schulz and Heckhausen’s (1996) article, older men’s primary control beliefs did not sharply drop in later life. Rather, many older men continued to emphasize primary control as important, even into their very late life. Furthermore,

consistent with control theory, the percentage of those who endorsed secondary control increased with age; and of those whose narratives included both primary and secondary control, a significant number switched emphasis from primary to secondary control over time. This finding supported Rothbaum et al.’s (1982) notion that individuals could switch from one type of control to another in response to changing life circumstances. Hence, theoretically, our findings shed new light on the under-researched area of control beliefs in older men. Practically, our findings inform anyone seeking to help older men gain or maintain perceptions of control and age successfully near to the end of life.

Strengths and limitations

A major strength of the present study was the use of the Manitoba Follow-up Study’s longitudinal lay definitions of successful aging. To the best of our knowledge, no other studies have as detailed narrative data on successful aging from older men, who can be at times agentic when it comes to divulging things of a personal nature such as their control beliefs. Without this narrative data, our study on control perceptions and successful aging in older men would not have been possible.

Another strength of the present study was our use of the MFUS-SA-CM v.1 to map themes from older men’s lay definitions of successful aging onto Rothbaum et al.’s (1982) primary and secondary control. That the coding system was viable for use in this fashion with older men suggests that it could be used in the same way for mapping themes from the successful aging narratives of other cohorts onto this and other control paradigms, making it a useful tool for researchers interested in control and successful aging alike.

Concerning the limitations of the present study, the MFUS members were originally selected based on having been apparently healthy male WWII aircrew recruits. This calls into question the potential generalizability of our results to other subgroups of the population, such as women. That being said, in light of our goal to narrow the gap in the control literature on older men, the MFUS cohort was sufficient. A related question might be, what of the control beliefs of the men who were no longer part of the study due to their being deceased, too ill, or otherwise having dropped out? Although this is an interesting question, it is beyond the scope of this study, which focused on the continuation of successful aging for as long as possible into later life.

Another potential limitation of the present study is that our analyses on prevalence and trends in prevalence were not done at the individual level. Rather, they were performed at the population level, in the interests of seeing the “big picture”. Our reasoning for this was that seeing the “big picture” to begin with would be valuable in formulating specific hypotheses for future analyses in terms of knowing what to expect regarding changes in prevalence (or not) of older men’s control beliefs over time. Now that we have an idea of the prevalence and trends in prevalence of the themes representing primary and secondary control beliefs, additional studies are needed to highlight which specific control beliefs are beneficial for older men’s health and well-being over time and which are not. Once we have this information, we will be better positioned to start to consider the potential

design of a cognitive behavioral intervention aimed at promoting and enhancing perceived control and successful aging in older men.

Conclusions and implications

The present study employed a novel way of assessing control beliefs in older men, using the MFUS-SA-CM v.1 as a classification taxonomy with which to map themes from older men's lay definitions of successful aging onto Rothbaum et al.'s (1982) constructs of control. Our work builds on that of Schulz and Heckhausen (1996) who surmised that control could be equated to successful aging. This in turn helped us shed new light on the under-researched area of older men's control beliefs in later life. Our quantitative findings showed that counter to what was expected, primary control (i.e., taking direct action) remained important to older men as they aged. Consistent with our expectations, the prevalence of the successful aging definitions that included only secondary control beliefs (i.e., psychological adaptation) increased over time. Further, in the group of men whose successful aging definitions included themes of both primary and secondary control, a significant number switched emphasis from primary to secondary control with age, empirically supporting Rothbaum and colleagues' switching hypothesis. If, in future studies, we can determine which specific sub-types of primary and secondary control older men emphasize, and under what circumstances, we will be one step closer to being able to significantly and positively impact older men's well-being and perhaps even survival. As Tate et al. (2013, p. 317) so aptly put it, "Perhaps once the body starts to physically fail, it becomes progressively more important to try to help the individual inside".

Future directions for this research will involve repeating our quantitative analyses at the individual level. Doing so will allow us to look back at the different stressors that occurred throughout each man's life, and consider how these stressors influenced the man's perceptions of control over time and ultimately, his ability to age successfully. Repeating our analyses on different socio-demographic subgroups of the population would also be informative. Researchers with access to the longitudinal successful aging narratives of people of different ages, genders, or cultures could map themes from their successful aging definitions onto primary and secondary control, to explore the prevalence/trends in prevalence of the control beliefs reported. Stressors over the lifespan could then be considered, to examine how stress influences perceptions of control and ultimately shapes an individual's propensity to age successfully. By replicating and extending the present study findings with different sub-groups of the population, social scientists working together could gain increased insight into individuals' inner worlds, and their secrets to aging successfully.

References

- Abramson, L. Y., Seligman, M. E., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology*, 87(1), 49–74.
- Affleck, G., Tennen, H., Croog, S., & Levine, S. (1987). Causal attribution, perceived control, and recovery from a heart attack. *Journal of Social and Clinical Psychology*, 5(3), 339–355.
- Austad, S. N. (2006). Why women live longer than men: Sex differences in longevity. *Gender Medicine*, 3(2), 79–92.
- Barry, L. C., Kasl, S. V., Lichtman, J., Vaccarino, V., & Krumholz, H. M. (2006). Perceived control and change in physical functioning after coronary artery bypass grafting: A prospective study. *International Journal of Behavioral Medicine*, 13(3), 229–236.
- Bennett, K. M. (2007). "No sissy stuff": Towards a theory of masculinity and emotional expression in older widowed men. *Journal of Aging Studies*, 21, 347–356.
- Bennett, K. M., & Vidal-Hall, S. (2000). Narratives of death: A qualitative study of widowhood in later life. *Ageing and Society*, 20, 413–428.
- Biela, U., & Pajak, A. (2005). Intake of selected nutrients by perceived control over life, over health and general control in men and women aged 45–64, residents of Krakow. *Przegląd Lekarski*, 62(12), 1367–1371.
- Boerner, K., Brennan, M., Horowitz, A., & Reinhardt, J. P. (2010). Tackling vision-related disability in old age: An application of the life-span theory of control to narrative data. *Journal of Gerontology: Psychological Sciences*, 65B(1), 22–31.
- Bormann, J. E., & Carrico, A. W. (2009). Increases in positive reappraisal coping during a group-based mantra intervention mediate sustained reductions in anger in HIV-positive persons. *International Journal of Behavioral Medicine*, 16(1), 74–80.
- Braam, A. W., Schaap-Jonker, H., Mooi, B., De Ritter, D., Beekman, A. T., & Deeg, D. J. (2008). God image and mood in old age: Results from a community-based pilot study in the Netherlands. *Mental Health, Religion and Culture*, 11(2), 221–237.
- Büssing, A., Fischer, J., Ostermann, T., & Matthiessen, P. F. (2008). Reliance on God's help, depression and fatigue in female cancer patients. *International Journal of Psychiatry in Medicine*, 38(3), 357–372.
- Bye, D., & Pushkar, D. (2009). How need for cognition and perceived control are differentially linked to emotional outcomes in the transition to retirement. *Motivation and Emotion*, 33(3), 320–332.
- Calfee, C. S., Katz, P. P., Yelin, E. H., Iribarren, C., & Eisner, M. D. (2006). The influence of perceived control of asthma on health outcomes. *Chest*, 130(5), 1312–1318.
- Cheng, C., Chan, N., Hin-man Chio, J., Chan, P., On-on Chan, A., & Hui, W. (2012). Being active or flexible? Role of control coping on quality of life among patients with gastrointestinal cancer. *Psycho-Oncology*, 21, 211–218.
- Chipperfield, J. G., Newall, N. E., Perry, R. P., Stewart, T. L., Bailis, D. S., & Ruthig, J. C. (2012). Sense of control in late life: Health and survival implications. *Personality and Social Psychology Bulletin*, 38(8), 1081–1092.
- Chipperfield, J. G., Perry, R. P., Bailis, D. S., Ruthig, J. C., & Chuchmach, L. P. (2007). Gender differences in use of primary and secondary control strategies in older adults with major health problems. *Psychology and Health*, 22(1), 83–105.
- Chipperfield, J. G., Perry, R. P., & Menec, V. H. (1999). Primary and secondary control-enhancing strategies: Implications for health in later life. *Journal of Aging and Health*, 11(4), 517–539.
- Chiu, T., & Spencer, G. A. (2009). Functional health status among rural and urban older adults in Taiwan: The effect of personal control and social control. *International Journal of Older People Nursing*, 5(3), 202–210.
- Cvengros, J. A., Christensen, A. J., & Lawton, W. J. (2004). The role of perceived control and preference for control in adherence to a chronic medical regimen. *Annals of Behavioral Medicine*, 27(3), 155–161.
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology*, 46(4), 839–852.
- Garnefski, N., & Kraaij, V. (2009). Cognitive coping and psychological adjustment in different types of stressful life events. *Individual Differences Research*, 7(3), 168–181.
- Garnefski, N., Teerds, J., Kraaij, V., Legerstee, J., & van den Kommer, T. (2003). Cognitive emotion regulation strategies and depressive symptoms: Differences between males and females. *Personality and Individual Differences*, 36(2), 267–276.
- Hall, N. C. (2006). Optimizing primary and secondary control in achievement settings: An examination of Rothbaum et al.'s (1982) congruence hypothesis (doctoral dissertation). Retrieved from <http://hdl.handle.net/1993/202>
- Hall, N. C. (2008). Self-regulation of primary and secondary control in achievement settings: A process model. *Journal of Social and Clinical Psychology*, 27(10), 1126–1164.
- Harrington, S., McGurk, M., & Llewellyn, C. D. (2008). Positive consequences of head and neck cancer: Key correlates of finding benefit. *Journal of Psychosocial Oncology*, 26(3), 43–62.
- Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review*, 102(2), 284–304.
- Helgeson, V. S. (1994). Relation of agency and communion to well-being: Evidence and potential explanations. *Psychological Bulletin*, 116(3), 412–428.
- Hernandez-Tejada, M. A., Lynch, C. P., Strom, J. L., & Egede, L. E. (2012). Effect of perceived control on quality of life in indigent adults with Type 2 diabetes. *The Diabetes Educator*, 38(2), 256.

- Infurna, F. J., Gerstorf, D., Ram, N., Schupp, J., & Wagner, G. G. (2011). Long-term antecedents and outcomes of perceived control. *Psychology and Aging, 26*(3), 559–575.
- Jaser, S. S., & White, L. E. (2011). Coping and resilience in adolescents with type 1 diabetes. *Child: Care, Health and Development, 37*(3), 335–342.
- Johnson, C. L., & Barer, B. M. (1993). Coping and a sense of control among the oldest old: An exploratory analysis. *Journal of Aging Studies, 7*(1), 67–80.
- Kraaij, V., & Garnefski, N. (2006). The role of intrusion, avoidance, and cognitive coping strategies more than 50 years after war. *Anxiety, Stress, and Coping, 19*(1), 1–14.
- Kunzmann, U., Little, T., & Smith, J. (2002). Perceiving control: A double-edged sword in old age. *Journal of Gerontology: Psychological Sciences, 57B*(6), P484–P491.
- Lachman, M. E., Neupert, S. D., & Agrigoroaei, S. (2011). The relevance of control beliefs for health and aging. In K. W. Schaie, & S. L. Willis (Eds.), *Handbook of the psychology of aging* (pp. 175–190) (7th ed.).
- Lequerica, A. H., Forchheimer, M., Tate, D. G., Roller, S., & Toussaint, L. (2008). Ways of coping and perceived stress in women with spinal cord injury. *Journal of Health Psychology, 13*(3), 348–354.
- Mathewson, F. A., Manfreda, J., Tate, R. B., & Cuddy, T. E. (1987). The University of Manitoba Follow-up Study — an investigation of cardiovascular disease with 35 years of follow-up (1948–1983). *The Canadian Journal of Cardiology, 3*(8), 378–382.
- O'Rourke, N., Kupferschmidt, A. L., Claxton, A., Smith, J. Z., Chappell, N., & Beattie, B. L. (2010). Psychological resilience predicts depressive symptoms among spouses of persons with Alzheimer disease over time. *Aging and Mental Health, 14*(8), 984–993.
- Pargament, K. I., Koenig, H. G., Tarakeshwar, N., & Hahn, J. (2004). Religious coping methods as predictors of psychological, physical and spiritual outcomes among medically ill elderly patients: A two-year longitudinal study. *Journal of Health Psychology, 9*(6), 713–730.
- Park, C. L., Malone, M. R., Suresh, D. P., Bliss, D., & Rosen, R. I. (2007). Coping, meaning in life, and quality of life in congestive heart failure patients. *Quality of Life Research, 17*, 21–26.
- Peters, L., & Sellick, K. (2006). Quality of life of cancer patients receiving inpatient and home-based palliative care. *Journal of Advanced Nursing, 53*(5), 524–533.
- Roberts, B. L., Dunkle, R., & Haug, M. (1994). Physical, psychological, and social resources as moderators of the relationship of stress to mental-health of the very old. *Journals of Gerontology, 49*(1), S35–S43.
- Rothbaum, F., Weisz, J., & Snyder, S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*(1), 5–37.
- Schroevers, M. J., Kraaij, V., & Garnefski, N. (2011). Cancer patients' experience of positive and negative changes due to the illness: Relationships with psychological well-being, coping, and goal re-engagement. *Psycho-oncology, 20*(2), 165–172.
- Schulz, R., & Heckhausen, J. (1996). A life span model of successful aging. *American Psychologist, 51*(7), 702–714.
- Sears, S. R., Stanton, A. L., & Danoff-Burg, S. (2003). The yellow brick road and the emerald city: Benefit finding, positive reappraisal coping, and posttraumatic growth in women with early-stage breast cancer. *Health Psychology, 22*(5), 487–497.
- Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology, 71*(3), 549–570.
- Surtees, P. G., Wainwright, N. W., Luben, R., Wareham, N. J., Bingham, S. A., & Khaw, K. (2010). Mastery is associated with cardiovascular disease mortality in men and women at apparently low risk. *Health Psychology, 29*(4), 412–420.
- Swift, A. (2004). A longitudinal analysis of control beliefs as moderators of the relationship between stress and well-being in later life. Retrieved from: <http://hdl.handle.net/1993/15751>
- Swift, A. (2010). An analysis of secondary control beliefs and physical and psychological well-being in older individuals. Retrieved from: <http://hdl.handle.net/1993/4345>
- Swift, A. U., Bailis, D. S., Chipperfield, J. G., Ruthig, J. C., & Newall, N. E. (2008). Gender differences in the adaptive influence of folk beliefs: A longitudinal study of life satisfaction in aging. *Canadian Journal of Behavioural Science, 40*(2), 104–112.
- Swift, A. U., & Chipperfield, J. G. (2013). Secondary control belief combinations and well-being in older adults: The benefits of adjustment and acceptance. *Canadian Journal on Aging, 32*(4).
- Tate, R. B., Lah, L., & Cuddy, T. E. (2003). Definition of successful aging by elderly Canadian males: The Manitoba follow-up study. *The Gerontologist, 43*(5), 735–744.
- Tate, R. B., Swift, A. U., & Bayomi, D. J. (2013). Older men's lay definitions of successful aging over time: The Manitoba follow-up study. *International Journal of Aging and Human Development, 76*(4), 299–324.
- Tellegen, A., Lykken, D. T., Bouchard, T. J., Wilcox, K. J., Segal, N. L., & Rich, S. (1988). Personality similarity in twins reared apart and together. *Journal of Personality and Social Psychology, 54*(6), 1031–1039.
- Tennen, H., Affleck, G., Urrows, S., Higgins, P., & Mendola, R. (1992). Perceiving control, construing benefits, and daily processes in rheumatoid arthritis. *Canadian Journal of Behavioural Science, 24*(2), 186–203.
- Thompson, S. C., Thomas, C., Rickabaugh, C. A., Tantamjarik, P., Otsuki, T., Pan, D., et al. (1998). Primary and secondary control over age-related changes in physical appearance. *Journal of Personality, 66*(4), 583–605.
- Tobin, S. J., & Raymundo, M. M. (2010). Causal uncertainty and psychological well-being: The moderating role of accommodation (secondary control). *Personality and Social Psychology Bulletin, 36*(3), 371–383.
- Tong, E. M., Bishop, G. D., Enkelmann, H. C., Why, Y. P., Diong, S. M., Khader, M., et al. (2005). The use of ecological momentary assessment to test appraisal theories of emotion. *Emotion, 5*(4), 508–512.
- Walker, K., Lindner, H., & Noonan, M. (2009). The role of coping in the relationship between depression and illness severity in chronic fatigue syndrome. *Journal of Allied Health, 38*(2), 91–99.
- Windor, T. D. (2009). Persistence in goal striving and positive reappraisal as psychosocial resources for aging well: A dyadic analysis. *Aging & Mental Health, 13*(6), 874–884.
- Yates, P., Edwards, H., Nash, R., Aranda, S., Purdie, D., Najman, J., et al. (2004). A randomized controlled trial of a nurse-administered educational intervention for improving cancer pain management in ambulatory settings. *Patient Education and Counseling, 53*(2), 227–237.