

Facing Off-Time Mortality: Leaving a Legacy

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Considering one's legacy is usual in later life but may be accentuated after receiving a serious and terminal cancer diagnosis. This may be particularly true when timing of the diagnosis is nonnormatively early, evoking the sense of losing future years of life. Acknowledging the severity of one's illness may also promote focus on legacy. We investigated the extent to which older individuals diagnosed with cancer narrated *communion* (i.e., loving, caring themes) when telling their legacy, including narration of *aftermath concerns* (i.e., concern for how others will fare after one's death). Communion was assessed in relation to individuals' potential years of life to lose and illness acknowledgment. Participants were a national sample of adults ($N = 203$; $M = 65.80$ years; 66% women; 77.94% White; 48.53% college-educated) with serious and terminal cancer receiving outpatient palliative care. They narrated legacies in semistructured interviews and completed measures of illness acknowledgment. We developed a novel construct, potential years of life to lose, calculated as the difference between chronological age and national life expectancy at birth. Coders, trained to high reliability, content-analyzed legacy narratives for communion with follow-up coding for aftermath concerns. Hierarchical regression indicated that for those with more potential years of life to lose, acknowledging the severity of their illness was critical to narrating communion-rich legacies. Similarly, aftermath concerns were common in those with the most years of life to lose who were able to acknowledge the severity of their illness. Findings affirm the psychological richness of individuals' legacies in the second half of life and highlight one way they adaptively respond to the nonnormative timing of serious and terminal cancer.

Public Significance Statement

Leaving a legacy is an important task in the second half of life. However, facing death earlier than expected due to terminal illness can complicate the process of leaving a legacy and finding closure with loved ones. This study suggests that individuals facing death earlier than expected, who were closer to midlife, benefit from acknowledging their potential mortality in terms of narrating rich, warm legacies for their loved ones. These findings can inform how care providers and families may best support those facing serious and terminal illness earlier in life than expected through the death preparation process.

Keywords: legacy, life story, communion, life expectancy, illness acknowledgment

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Crafting a personal legacy is a developmental task that becomes increasingly salient in the second half of life (Hunter & Rowles, 2005; McAdams et al., 1993). Beyond the dispersal of wealth and possessions, one also leaves a psychosocial legacy. This includes passing down important words or memories to family and friends with hopes of long-lasting effects after one is gone. In the second half of life, adults' realization that time left to live is shorter than life already lived prompts interest in leaving a psychosocial legacy (Erikson, 1968). In the current research, we delve into the implicitly psychosocial nature of legacy through examining the long-standing construct of communion (McAdams et al., 1996) as represented in legacies. Communion refers to the expression of themes of love, caring, and union with others. Individuals often narrate a legacy specifically for family and friends: they hope to shape a legacy that fittingly represents their loving, caring relations with those they have known for years, or a lifetime (Reichstadt et al., 2010). Narrating legacies rich in communal themes such as love, caring, and union may be central in preparing for mortality in the wake of a life-threatening diagnosis (Hunter & Rowles, 2005).

While awareness of life's finitude generally increases in late life (Carstensen, 2021; Demiray & Bluck, 2014), this is heightened when directly facing a life-threatening illness. The risk of a serious and terminal cancer diagnosis is more likely in later adulthood (i.e., 50% of cancer-related deaths each year occur in adults over 65 years; Centers for Disease Control and Prevention [CDC], 2021) but there is also substantial risk in midlife (i.e., 25% of cancer-related deaths each year occur in adults aged 40–64 years; CDC, 2021). As such, though a serious and terminal cancer diagnosis in midlife is not normative, the likelihood of serious and terminal cancer diagnoses steadily increases after age 40 (White et al., 2014). A cancer diagnosis is difficult at any age. In midlife, however, individuals have more *potential years of life to lose*: their life can be characterized as being cut short in relation to general life expectancy (Gardner & Sanborn, 1990). Accordingly, we propose that those who have more potential years of life to lose may craft personal legacies with a greater focus on those they are leaving behind than individuals who are in late life.

In addition, regardless of when in the lifespan a life-threatening illness occurs, the first step is acknowledging the seriousness of the illness and the possibility of death (Anderson et al., 2013). Acknowledgment that one's illness is life-threatening shortens individuals' subjective sense of future years left to live. Although acknowledgment is difficult, it is also crucial in opening the door to engagement in end-of-life preparations including leaving a caring (i.e., communion-rich) legacy for close others. The present study examines how the timing of serious and terminal cancer in the lifespan (i.e., potential years of life to lose) and acknowledgment of illness shape the extent of communion included in narrated legacies of individuals receiving outpatient palliative care for cancer.

Leaving a Legacy of Care and Concern for Others

Desire for leaving a legacy is underpinned by motivations toward generativity, a classic construct in lifespan developmental psychology (Erikson, 1968). Generativity has been richly investigated in the adulthood and aging literature: it is theorized to be a central developmental task in midlife and beyond (McAdams & de St. Aubin, 1992). It captures the notion that, with the change in lifetime horizons in the second half of life, concern moves away from the self

and toward caring for the next generation (McAdams, 1993). Empirical work suggests individuals normatively become more generative in midlife and late life compared to young adulthood (McAdams et al., 1993) and that being more generative is linked with greater well-being in midlife and beyond (Schoklitsch & Baumann, 2012).

Clearly, generativity and legacy are thus linked, but leaving a legacy is just one specific form of generative behavior. As such, we focused in this research on the specific construct of legacy as it pertains directly to facing the end of life and to considering what one will leave behind for loved ones after their death. While legacy is often considered in terms of transference of tangible goods, it also includes intangibles handed down with long-lasting effects, to surviving others (Oxford English Dictionary, n.d.). We focus on this intangible, psychosocial form of legacy with particular emphasis on communion in individuals' legacies. Communion is a long-standing construct in psychology (Bakan, 1966) representing a fundamental aspect of human life: people's motivation to closely relate to and bond with others (McAdams et al., 1996). Our decision to focus on communion is grounded in past theory and research. Social connectedness is theorized as central to human life across the lifespan and particularly when facing endings, including death (Carstensen, 2021; Reichstadt et al., 2010). When reflecting on their lives, individuals describe communal relations more clearly as compared to other life domains (Morrison & Roese, 2011). Doing so may have positive consequences, particularly in the context of a legacy. Emphasizing relations with close others toward the end of life has been linked to greater psychological well-being and lower death anxiety than focusing on other domains (Van Hiel & Vansteenkiste, 2009).

Methodologically, communion can be studied with high ecological validity through content analysis of individuals' narratives (e.g., Grysman, 2022). Prior research on communion has focused on how individuals refer to warm, close relationships in their *current* social network (e.g., Diehl et al., 2004). In the present study, we extend narrative communion research to the novel situation of adults with serious and terminal cancer considering their legacy, that is, the messages they want to leave for others. One poignant consideration in this context is that individuals may express communal care and concern for what will happen in the future lives of their loved ones after they themselves are gone. Accordingly, we expanded the standard conceptualization and operationalization of communion to assess a new aspect, *aftermath concerns*. These have been defined by palliative care experts as concerns for how loved one's lives will unfold in the short- or long-term aftermath of one's death (Chochinov et al., 2004). Aftermath concerns have not traditionally been considered in research on communion but are, in fact, inherently communal. By definition, aftermath concerns involve care and concern for loved ones, but specifically as they relate to future situations in which one will not be present or have an opportunity to be there or positively intervene.

Potential Years of Life to Lose: Relation to Communion in Legacy

Theory stresses individuals' place in the lifespan as an important context for development (Baltes et al., 2006). Implicitly, individuals carry with them not only their chronological age but also their place in the lifespan in relation to potential years of life left (e.g., Demiray

& Bluck, 2014). One way individuals sense time left in life is through comparing their own life to the expected timing of events in a typical life (Neugarten, 1979), that is, a life script (e.g., Bohn, 2010). Though often implicitly, individuals carry a probabilistic sense of how much time is left in their lives (Liao & Carstensen, 2018). In the present research, we capture this operationalization through a novel construct, *potential years of life to lose*. This construct is grounded in epidemiological research that quantifies the impact of diseases, estimating premature death as the difference between life expectancy at birth (for a population) and age at death from a given disease (Gardner & Sanborn, 1990; Mitra et al., 2020). We created a person-level approach to this widely used population-level variable by calculating difference in life expectancy at birth (i.e., accounting for gender and race) and age at cancer diagnosis. The resulting value aligns with chronological age but importantly answers the repeated call to vary our conceptualization of chronological age (e.g., Wohlwill, 1970) to further empirical precision and conceptual richness in lifespan research. That is, while chronological age only represents time since birth, potential years of life to lose represents both time since birth and estimated time to death. Note also that, empirically, racial and gender disparities in life expectancy persist and have even widened in recent years (Arias et al., 2022). Another benefit of calculating potential years of life to lose is that it (i.e., unlike chronological age alone) accounts for demographic differences in life expectancy at birth.

Potential years of life to lose reflects that an off-time mortality threat is occurring in an individual's lifespan, which we posit may affect communal narration in legacy. As time horizons regarding years of life left to live shift in midlife and beyond, individuals tend to have increased concerns for meaningful closeness with loved ones and closure with family (Carstensen, 2021; McAdams & de St. Aubin, 1992). Individuals locate themselves as part of a multigenerational family that will continue forward after they are gone rather than focusing only on their own pursuits and well-being (King & Wynne, 2004). Accordingly, individuals with greater years of life to lose may have an increased drive for communion in their legacies as they seek closeness and closure on a shortened life timeline.

A life-threatening illness is not normatively expected during midlife. Such off-time occurrence may be even more stressful than receiving a diagnosis later in life (Linden et al., 2012). One aspect of this may be that, earlier in the lifespan, individuals have not often personally considered life's finality. In addition, given their life phase context, they are more likely to be caring for others, potentially multiple generations (Staudinger & Bluck, 2001). Termed the *sandwich generation* (Miller, 1981), adults in midlife often balance caregiving responsibilities, including financial, physical, and psychological aspects for both their children and aging parents while also maintaining their own employment (Lachman et al., 2015).

Adults in late life are also likely to narrate legacies rich in communion but are not subject to the same developmental pressures as adults in midlife. Older adults are often retired, though not always. However, retired older adults are typically no longer responsible for workplace roles, are less likely to have aging parents still living, and, most commonly, have adult children old enough to be self-sufficient. As such, adults at midlife, given their unique developmental obligations and more potential years of life to lose, may experience greater concerns about family than adults in late life when faced with the threat of mortality through serious illness diagnosis. They may thus narrate legacies infused with

greater communion as a way to address unfinished relationships with family and friends (e.g., children, partners, living parents, or coworkers).

Acknowledgment of Illness: Relation to Communion in Legacy

Since threats to mortality in midlife are developmentally off-time, the important task of acknowledging one's illness may be even more difficult. Prior research shows that those who acknowledge the serious and terminal nature of their illness have a more accurate idea of their life expectancy (Epstein et al., 2016), are more likely to openly discuss end-of-life issues surrounding their goals, values, hopes, and fears (Anderson et al., 2013), have more conversations about end-of-life with their family (Applebaum et al., 2014), and engage in more end-of-life planning (Ray et al., 2006). As such, it may be critical that adults at midlife acknowledge that their life may end, that it may even be cut short, so as to engage in end-of-life planning such as leaving a legacy.

Having a greater sense of the timing of one's death may facilitate crafting communal legacies with warmth and concern about those one will leave behind after death. Only half of patients with advanced cancer, however, accurately understand their prognosis, and this can lead to overestimating their life expectancy and not acknowledging death's nearness (Chen et al., 2017). Individuals who believe they have more time left in life than they likely do may not give priority to preparing themselves or their loved ones for their death. Taken together, we suggest that greater acknowledgment of one's illness may facilitate greater engagement in end-of-life preparation, specifically leaving a more caring, communal, legacy for others.

The Present Study

This research investigates the extent to which individuals in the second half of life express communion when narrating their personal legacy. Factors of interest include differing potential years of life to lose and the extent of acknowledging one's illness severity. The study has a preliminary aim, a multifaceted central aim, and an exploratory aim.

Aim 1: Examine Illness Acknowledgment by Cancer Prognosis

This aim was preliminary to assess whether cancer stage alone was responsible for participants' illness acknowledgment. This seemed prudent before investigating the role of acknowledgment in predicting the extent of communion in legacies. Illness acknowledgment is defined as reflecting participants' psychological perception of their illness severity, regardless of medical condition (Nipp et al., 2017). For the sake of rigor, however, we sought to empirically demonstrate that the acknowledgment variable was not simply reflecting the actual prognosis in our sample (i.e., diagnosed cancer stage). That is, we expected level of illness acknowledgment would not simply, directly align with cancer prognosis.

Aim 2: Determine Predictive Relations of Potential Years of Life to Lose, and Acknowledgment of Illness Severity, to Extent of Communion Expressed in Legacy Narratives

This aim is most central to the present research.

Aim 2a

Participants with more potential years of life to lose were expected to narrate more communal legacies.

Aim 2b

Participants who have acknowledged their illness as serious and terminal were expected to narrate more communion in legacies than those who perceived themselves as relatively healthy.

Aim 2c

Level of illness acknowledgment was expected to moderate relations between potential years of life to lose and extent of communion in legacy narratives; participants with more potential years of life to lose, who acknowledged the serious/terminal nature of their illness, were expected to narrate more communion in their legacies than participants who perceived themselves as relatively healthy.

Aim 3: Explore Relations Between Communion in Legacy and Aftermath Concerns

These analyses were exploratory. They focused on more deeply understanding how potential years of life to lose and illness acknowledgment were related to narrating communal legacies. Given the unique context of studying communion in adults seriously ill with cancer, we explored the extent to which those who narrated higher levels of communion did so in terms of aftermath concerns (i.e., communal care and concern for others once one has died). This provided an opportunity to define a new, specific form of communion grounded in extant palliative care literature on aftermath concerns.

Method

Transparency and Openness

This study leverages existing data from a six-site randomized controlled trial of Dignity Therapy (Kittelson et al., 2019). Our sample comprises those who completed Dignity Therapy in the parent study since the interview data were critical to present analyses. The sample size was determined prior to data collection and was considered sufficient for detecting weak effects at 80% power assuming a Type I error of 0.025. We employ a subset of measures from the larger study relevant to the present research questions. The deidentified data and R code to reproduce analyses are publicly available on the Open Science Framework along with the preregistered portion of this study. Hypotheses and analyses for the second aim were preregistered on the Open Science Framework. Hypotheses and analyses related to the first (preliminary) and third (exploratory) aims were not preregistered.

Participants

Participants were 203 adults in the second half of life who were receiving outpatient palliative care for serious and terminal cancer ($M = 65.80$ years, $SD = 7.45$, range = 55–88 years; 66% women). They self-identified race/ethnicity as 77.94% White, 11.76% Black or African American, 7.84% Hispanic or Latino, 0.49% American Indian or Alaska Native; 0.49% Asian, 0.49% Native Hawaiian or

other Pacific Islander, and 0.98% declined. The majority (82.84%) had completed some education posthigh school and about half (48.53%) had a college degree. Cancer types represented in the sample were diverse but most commonly lung (20%), breast (17%), and prostate (7%). Cancer Stages 1 through 4 were represented but the majority (54%) had a Stage 4 cancer diagnosis.

Recruitment occurred at six university medical centers across the United States during 2018. Participants were considered eligible for inclusion if they were (a) diagnosed with cancer, (b) receiving outpatient palliative care, (c) 55 years or older, (d) able to speak and read English, and (e) physically able to complete the study. Participants provided written informed consent and received \$150 for participation.

Procedure

The Institutional Review Board at each site approved the study (<https://clinicaltrials.gov>: NCT03209440). The University of Florida Institutional Review Board (RB201601190, “Dignity Therapy for Older Cancer Patients: Identifying Mechanisms and Moderators”) approved all research activities. Participants completed survey measures regarding their cancer stage, level of illness acknowledgment, and demographic information. They then engaged in a single one-on-one Dignity Therapy interview with a trained dignity provider, guided by an established protocol including a set of core questions. Dignity Therapy (Chochinov et al., 2005) is a brief psychotherapeutic intervention aimed at reducing psychosocial and existential distress in the seriously and terminally ill. It is rooted in a long lifespan developmental tradition of reminiscence and life review interventions (Birren & Deutchman, 1991; Bluck et al., 2014; Butler, 1963).

Data, including Dignity Therapy interview narratives used in the current narrative analyses, were collected between 2019 and 2022. Data collection occurred in person prior to the COVID-19 pandemic. After the onset of the COVID-19 pandemic, data collection was conducted virtually via telephone or video conference for safety. Interviews were audio recorded and subsequently professionally transcribed. Modality of data collection did not affect the length of interview that participants engaged in, $t(90.62) = 1.04$, $p = .30$, nor did it affect the frequency of the major outcome variable of communion, $t(64.93) = -1.12$, $p = .27$. Interview sessions lasted an average of 48.70 min (range = 19–94 min, $SD = 13.10$). The narratives participants produced in response to Dignity Therapy core questions focused on leaving a legacy (Chochinov et al., 2005; Core Questions 5–9; see *Supplemental Materials*) were reliably content-analyzed for themes of *communion* (McAdams, 2001) and a subset were further coded for *aftermath concerns* (Chochinov et al., 2004).

Measures

Potential Years of Life to Lose

Potential years of life to lose was calculated as the difference between average U.S. life expectancy at birth (individualized by each participant's gender and race/ethnicity; Arias et al., 2022) and their chronological age (i.e., when diagnosed with serious and terminal cancer and doing the interview). As such, potential years of life to lose is an indicator of the extent to which a person's life may be “cut short” due to their serious and terminal cancer diagnosis compared to general life expectancy. A score greater than zero

indicates more potential years of life to lose, that is, life being cut short (i.e., dying before reaching U.S. average life expectancy). Scores below zero (negative numbers) indicate living beyond U.S. average life expectancy. In general, scores greater than zero were indicative of midlife, and scores below zero were indicative of late life. On average, in this sample, participants had 11 potential years of life to lose ($SD = 8.32$). Potential years of life to lose ranged from -14.30 years (i.e., the participant had already lived 14.30 years beyond the national average life expectancy) to 25.60 years (i.e., the participant had the potential to die 25.60 years before the national average life expectancy at birth).

Illness Acknowledgment

All participants were in outpatient palliative care with serious and terminal cancer diagnoses. They self-reported their level of illness acknowledgment as (a) relatively healthy, (b) seriously but not terminally ill, or (c) seriously and terminally ill (Prigerson, 1992). Participants who endorsed the third category were considered to fully acknowledge their serious and terminal cancer diagnosis/palliative status. Across the sample, 42% reported being relatively healthy, 33% reported being seriously but not terminally ill, 21% reported being seriously and terminally ill, and 4% did not respond.

Content Analysis: Communion in the Legacy

Communion refers to instances in which, as part of narrating their legacy, individuals narrate concern for others or coming together in warm, close, communicative relationships (McAdams et al., 1996). We assessed themes of communion expressed in the legacy narratives, following best practices for narrative analysis (Adler et al., 2017) using a slightly modified standard communion codebook (McAdams, 2001). Before coding, transcribed narratives were divided into natural idea units (i.e., topical paragraphs; Baker-Brown et al., 1992).

As per standard guidelines, communion was coded as occurring when narratives contained any of the following: love and friendship,

caring and help, and unity and togetherness (see Table 1 for example). For each of the three communion subthemes, idea units were coded with a "1" if the subtheme was present and a "0" if the subtheme was absent. Accordingly, each idea unit could receive a sum communion score from 0 (*no communion present*) to 3 (*love and friendship, caring and help, and unity togetherness all present*). Two coders were rigorously trained on pilot narratives to achieve strong interrater reliability across all communion themes (love and friendship $\kappa = .71$; caring and help $\kappa = 1$; unity and togetherness $\kappa = 1$). Reliability was measured with Cohen's κ , which accounts for the proportion of agreement between coders that is not due to chance and is considered the gold standard of reliability indexes for life story coding (Cohen, 1960; Syed & Nelson, 2015). After the two coders reaching reliability, all legacy narratives were double-coded for additional rigor. Any remaining discrepancies between the two trained coders were resolved through discussion. Coder drift was avoided through regular coding team meetings.

A mean communion score was created by first summing the communion score for each idea unit in a given legacy narrative. The sum for the whole narrative was then divided by the total number of idea units in that narrative. This resulted in communion scores that were adjusted for the varying lengths of participants' legacy narratives.

Follow-Up Content Analysis: Aftermath Concerns

Aftermath concerns refer to thoughts a seriously ill person has related to the impact their death will have on important others they will leave behind (Chochinov et al., 2004). We created a go/no-go coding system for aftermath concerns to explore the extent to which instances already coded for communion in cancer outpatients' legacy narratives referred to aftermath concerns.

Two coders assessed the presence ("1") or absence ("0") of aftermath concerns, using a newly developed, standard codebook, in all idea units where communion had occurred. Aftermath concerns were defined as present if coders could (a) specify a perceived challenge or concern the participant narrated about an important other

Table 1
Examples of Communion Subthemes Coded in Study Narratives

Communion subtheme	Narrative Example no. 1	Narrative Example no. 2
Love and friendship	"Well, I just tell 'em [my children] I love 'em as much as I can and every time I touch 'em, every time they come to my house, I make sure I hug their neck and say, hey, I love you, man. I appreciate it, you know?"	"Reflect on the love that I had for them [my children]. If you can just keep that in mind, look at all the pictures that we've taken, they're going to be able to reflect on the love that I had for them."
Caring and help	"That I'm the grandma who you can come to for anything, and I want her to know—and I would love 'em to know that I can—they can always count on talkin' to me and me bein' there to listen and to understand and even if it's not somethin' that's really good."	"All my kids, they know that that I never try to give 'em bad advice. I just try to give them what I would do, not what I've done, but what I would do now. Because now that I'm more mature than what I was when I was their mom while they were growing up, I was still learning things 'cause I was so young. I didn't know, and they had to grow up with me. I can give them great advice now because of my maturity and what I've learned."
Unity and togetherness	"I think, because of this cancer, we've already gone through the phase of—I don't wanna say saying goodbye, but it brings that to the front because you've got—the first thing, when you heard the word cancer, is death. I think, because, now, I've lived five years with it, it's not such a scary thing. I think that we hold love a lot closer because of it. It made us a tighter unit, I think."	Participant: "We just all sit and laugh and talk and share things." Interviewer: "Oh, that's a terrific connection." Participant: "It is. Our group of girls from high school were so close. We really are, which is nice."

in the *future, after their death*, and (b) identify the particular person(s) the aftermath concern was directed toward (e.g., mother, brother). Two coders were trained to excellent interrater reliability ($\kappa = .93$). They both coded all the relevant narratives. Any discrepancies were resolved in regular coding meetings.

Results

Aim 1: Examine Illness Acknowledgment by Cancer Prognosis

As a preliminary aim, we conducted chi-square tests to assess whether illness acknowledgment was psychologically informative beyond medical prognosis in the form of cancer stage, or if acknowledging mortality was simply reflective of having a serious and terminal prognosis. Both chi-square results support our view of illness acknowledgment as a variable that provides psychological insight into participants' own perceptions of their health, distinct from their medically derived objective cancer stage. Sixteen participants had nonstaged cancer and were not included in these analyses.

In line with our conceptualization of illness acknowledgment as a matter of patient perception (Prigerson, 1992), the first chi-square test indicated no difference in illness acknowledgment by cancer stage, $\chi^2(6, 181) = 7.05, p = .32$. Inspecting the distribution of illness acknowledgment across Stages 1–3 compared to Stage 4, however, suggested potential differences between having Stage 4 cancer versus any other stage. Accordingly, we conducted an additional chi-square to decompose the pattern of illness acknowledgment between those with Stage 4 cancer prognoses compared to a collapsed Stages 1–3 category. Again, results indicated illness acknowledgment did not significantly differ according to whether participants had a Stage 4 cancer prognosis or not, $\chi^2(2, 181) = 5.55, p = .06$. Strikingly, participants with a Stage 4 diagnosis ($n = 110$) were approximately evenly distributed across the three acknowledgment categories (see Figure 1). This included 39 participants with a Stage 4 diagnosis rating themselves as relatively healthy. In sum, acknowledgment appears to be, as conceptualized, a psychological variable not directly associated with medical prognosis.

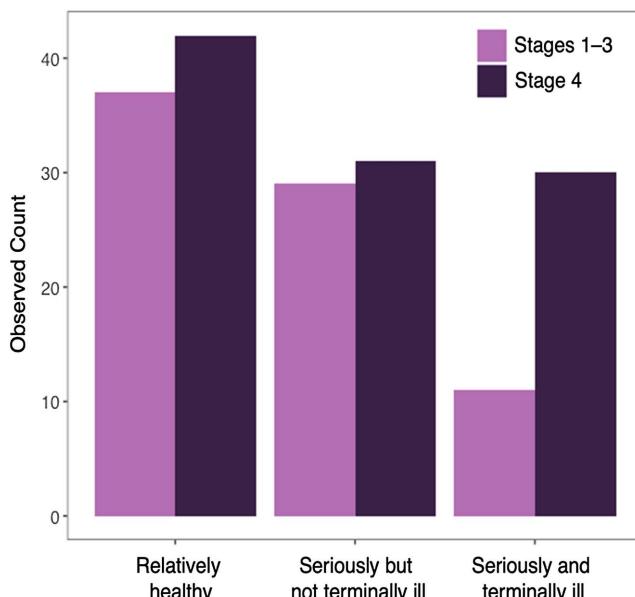
Aim 2a–2c: Determine Predictive Relations of Potential Years of Life to Lose, and Acknowledgment of Illness Severity, to Extent of Communion Expressed in Legacy Narratives

Aim 2a and 2b addressed main effects and Aim 2c focused on interaction effects in hierarchical regressions testing these relations in R (R Core Team, 2021). In both models, covariates included gender and cancer stage. Given results from Aim 1 analyses, we used a binary version of cancer stage where Stage 4 = 1 and Stages 1–3 = 0 for model simplicity. Note that result patterns were similar whether collapsing or not collapsing Stages 1–3.

Aim 2a and 2b

Descriptives of the communion variable are first provided to put analyses in context. Across the sample, 92% of participants included at least one instance of communion when narrating their legacy but there was considerable variation in the extent of communion narrated in their personal legacies. Sum communion ranged from 0 to

Figure 1
Frequency Distribution of Illness Acknowledgment by Cancer Stage



Note. See the online article for the color version of this figure.

18 ($M = 3.16, SD = 2.71$) with median sum communion at 3. To account for differences in narrative length, we conducted all analyses with the mean communion variable we constructed by dividing sum communion divided by total idea units. Mean communion ranged from 0 to 1.67 ($M = 0.43, SD = 0.32$) with median mean communion at .40. Content-wise, in communion-rich narratives, participants expressed such things as how they wished to be remembered, hopes they had for loved ones' futures, and loving feelings toward others in their lives (see Table 2). In contrast, participants low in communion responded to legacy questions without focusing on warm feelings or concerns for others in their lives.

We conducted hierarchical regression analyses to test whether communion in legacy was associated with the main effects of either potential years of life to lose or illness acknowledgment. Due to its multicategorical nature, we dummy-coded illness acknowledgment such that the seriously-and-terminally ill group was the reference group. Results from the main effects model indicated that potential years of life to lose positively predicted mean communion in legacies (Cohen's $f^2 = .05$): Participants whose lives may be cut short, who had more potential years of life to lose, narrated more communal legacies ($B = .01, SE = .003, p < .01$). There was also a main effect for illness acknowledgment (Cohen's $f^2 = .04$) such that participants in the seriously-and-terminally ill group acknowledgment group included more communion in their legacies ($M = 0.50, SD = 0.39$) than the seriously but not terminally ill group ($M = 0.37, SD = 0.30$). There was no significant difference in communion between the seriously-and-terminally ill group and the relatively healthy group in the main effect model ($M = 0.42, SD = 0.27$; see Table 3).

Aim 2c

Next, we tested an interaction model examining the moderating effect of illness acknowledgment on relations between potential

Table 2*Example of High and No Communion Code in the Legacy Narrative*

Communion code	Example from participant narrative
High communion	<p><i>Interviewer:</i> Are there things that you feel need to be said to your loved ones or things that you would want to say again?</p> <p><i>Interviewee:</i> ... the first thing, when you hear the word cancer, is death. I think, because, now, I've lived five years with it, it's not such a scary thing. I think that we hold love a lot closer because of it. It made us a tighter unit, I think.</p> <p><i>Interviewer:</i> Okay. What would you want to say to them?</p> <p><i>Interviewee:</i> ... Love them dearly. [I] hope they have a good life. I'll miss them. I hope they miss me.</p> <p><i>Interviewer:</i> Yeah. What are your hopes and dreams for your loved ones? What are your hopes and dreams for your daughter?</p> <p><i>Interviewee:</i> ... She has a wonderful husband. I hope that they live a long life together. They both seem to be in pretty good health. I'm hoping that they'll enjoy this part of their life even more ... livin' together as husband and wife and raisin' a family.</p>
No communion	<p><i>Interviewer:</i> Any particular advice or guidance you'd wish to pass along to your family?</p> <p><i>Interviewee:</i> No, I don't offer that. We're all gonna do what we wanna do, and we all do it for different reasons. They see, through me, what can result from your actions when you just don't give it a lotta thought and don't think it through. I think they're all very, very aware of that.</p> <p><i>Interviewer:</i> Any important words or instructions you'd like to offer them?</p> <p><i>Interviewee:</i> Yeah, I really don't think I can add to their life by anything that I would say anymore.</p>

years of life to lose and extent of communion in legacy narratives. Interaction terms were centered to reduce issues with collinearity. Illness acknowledgment was dummy-coded such that the seriously-and-terminally ill group was the reference group. In the interaction model, the main effect of potential years of life lost on mean communion remained significant (Cohen's $f^2 = .05$), as did the main effect of the seriously-and-terminally ill group compared to the seriously but not terminally ill group (Cohen's $f^2 = .04$). In addition, the seriously-and-terminally ill group showed a significant difference in communion compared to the relatively healthy group in the interaction model (see Table 3; Cohen's $f^2 = .04$). The interaction between potential years of life to lose and illness acknowledgment indicated that the slope of potential years of life to lose differed for those rating themselves as relatively healthy compared to those acknowledging that they are seriously and terminally ill. In particular, this effect was driven by more narration of communion in their legacy by those with more potential years of life to lose who also showed acknowledgment that their illness is terminal. The slopes of potential years of life to lose followed a similar trend for the seriously-and-terminally ill acknowledgment group and the seriously but not terminally ill acknowledgement group: Both narrated more communion when potential years of life to lose was greater (see Figure 2). However, this effect was strongest for the seriously-and-terminally ill acknowledgment group.

Aim 3: Explore the Relation Between Communal Legacy and Aftermath Concerns

To further explore findings from the interaction model, we derived a Johnson–Neyman interval of significance to determine for which participants the interaction between potential years of life to lose and illness acknowledgment was significant (D’Alonzo, 2004). Note that we used this analysis only as a technical approach to guide subset selection. The Johnson–Neyman interval indicated that the interaction was significant for participants with 13.04 or more potential years of life to lose (i.e., those whose diagnosis was occurring about 13 years before average life expectancy from birth). We thus identified the 89 participants whose lives may be “cut short.” In the cut short group, potential years of life to lose ranged from 13.20 to 25.60 years ($M = 17.99$, $SD = 3.20$). Chronologically, the cut short group was largely in late midlife. In terms of illness acknowledgment, in the “cut short” group, 42 participants indicated they were relatively healthy, 31 participants indicated they were seriously but not terminally ill, and 16 participants indicated they were seriously and terminally ill.

The focus of these exploratory analyses was to see if the higher levels of communion in those whose lives may be cut short, but who are able to acknowledge their illness, was because individuals were narrating aftermath concerns for others. As such, we conducted aftermath concern coding in the “cut short” group, exploring differences in the extent to which individuals narrated aftermath concerns by their level of acknowledgment of their illness. These aftermath concerns encompassed a range of themes related to concerns about how participants’ loved ones would repair family relationships, maintain religious faith, or learn certain skills once the participant dies (see Table 4 for narrative examples).

We examined differences in aftermath concerns in legacy across level of illness acknowledgment using one-way analysis of variance and Tukey’s method for pairwise mean comparison in R. There was a significant difference by level of illness acknowledgment in the number of aftermath concerns included in legacies, $F(2, 86) = 8.32$, $p < .001$ (Cohen’s $f = .44$). Those who indicated they were relatively healthy included the fewest aftermath concerns ($M = 0.09$, $SD = 0.12$). Those who reported they were seriously but not terminally ill were in the middle ($M = 0.13$, $SD = 0.14$). Those who acknowledged they were seriously and terminally ill included the most aftermath concerns in their legacy ($M = 0.28$, $SD = 0.28$). Pairwise comparisons indicated that the seriously-and-terminally ill group included significantly more aftermath concerns than both other acknowledgment groups. There was not a significant difference between the relatively healthy and seriously but not terminally ill group (see Figure 3). Further, aftermath concerns were present in almost half (45.16%) of all instances of communion in the seriously-and-terminally ill group. Conversely, aftermath concerns were only present in 28.26% of the seriously but not terminally ill and 20.93% of the relatively healthy groups’ instances of communion. That is, for those participants who had the most potential years of life to lose and fully acknowledged their illness, aftermath concerns were a common feature of communion narration in their legacies.

Discussion

It is a human desire to live on in the lives of others after death (Wade-Benzoni, 2019) and normative in the second half of life to

Table 3
Main and Interaction Effects for Regression Predicting Extent of Communion in Legacy

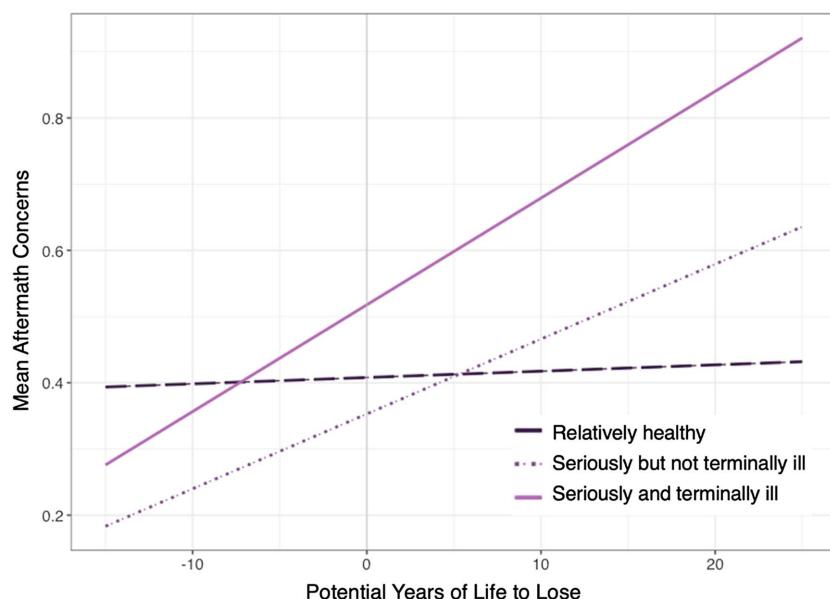
Variable	B	SE	95% CI	p
Main effects model				
Intercept	.53	.06	[.42, .64]	.001
Cancer stage (Stage 4 vs. Stages 1–3)	-.04	.05	[-.14, .04]	.26
Potential years of life to lose	.01	.003	[.002, .01]	.003
Illness acknowledgment (relatively healthy)	.01	.003	[-.21, .01]	.07
Illness acknowledgement (seriously but not terminally ill)	-.16	.06	[-.27, -.04]	.01
Interaction model				
Intercept	.54	.06	[.43, .65]	.001
Cancer stage (Stage 4 vs. Stages 1–3)	-.04	.04	[-.13, .04]	.33
Potential years of life to lose	.02	.006	[.01, .03]	.002
Illness acknowledgment (relatively healthy)	-.11	.06	[-.22, .001]	.05
Illness acknowledgment (seriously but not terminally ill)	-.16	.06	[-.28, -.5]	.006
Potential Years of Life to Lose × (Relatively Healthy)	-.02	.01	[-.03, -.002]	.02
Potential Years of Life to Lose × (Seriously But Not Terminally Ill)	-.005	.01	[-.02, .01]	.49

Note. Main effects model fit statistics, $F(4, 175) = 3.88, p = .004$. Interaction model fit statistics, $F(6, 173) = 3.66, p = .002$. The reference group for illness acknowledgment was “seriously-and-terminally ill.” SE = standard error; CI = confidence interval.

focus on how one will be remembered by others (e.g., Morrison & Roese, 2011). While motivation toward connection and communion with others occurs across the lifespan (Bakan, 1966), it may be a particularly important part of the psychosocial legacy one hopes to leave after death. In the current research, we proposed that facing mortality off-time (Neugarten, 1979) as compared to closer to life expectancy would be associated with greater expression of communal themes in legacy. Our findings, in a sample of adults in the second half of life with serious and terminal cancer, show that communion is a common component of most individual’s legacies.

Further, as predicted, communion was especially pronounced in the legacies of those who had the most potential years of life to lose (i.e., diagnosed in late midlife). Among such individuals, being able to acknowledge the terminal nature of their illness was critical: those with greater acknowledgment showed greater expression of communion (e.g., care and concern for others) in their legacy. Below we discuss the implications of these findings. In doing so, we also highlight the innovative approach taken in the present study: the extension of the long-standing construct of communion (Bakan, 1966) to include aftermath concerns.

Figure 2
Interaction Between Potential Years of Life to Lose and Illness Acknowledgment Predicting Mean Communion in Legacy



Note. Values below zero on the x-axis indicate years of life lived exceeds the national average life expectancy, and values above zero indicate years of life lived is fewer than the national average life expectancy. See the online article for the color version of this figure.

Table 4
Examples of Aftermath Concerns in the Legacy Narrative

Example from participant narrative
[Participant expresses concern that her adult siblings will not repair their relationships with one another.]
"To be honest with you, I feel they're being very selfish, not only to themselves, but to their children. I want them to know how I feel. I won't be around forever. ... I just want them to love each other. Whether I'm here or not here, I just think it's important for them to just forget and rebuild that relationship and just find a way to do it. I've tried to do it."
[Participant responds to question regarding instructions for family on her death, by focusing on their continuing emphasis on family and religiosity.]
"I want them all to stay close to God. I hope that I have left enough of a legacy for them to know that there is nothing stronger than family, nothing. I've learned in life that it's important to look to God for every decision 'cause he will never lead you astray, and I didn't always do that."
[Participant expresses concerns that he will not be there for important milestones and to teach and be a model for children after his passing.]
"I love you and I wish things could have been different, where I coulda seen you graduate. Where I could teach you and show you to do certain things. I took 'em fishin' and stuff when I could and I loved doin' that."

Facing Off-Time Mortality: Communion in Legacies

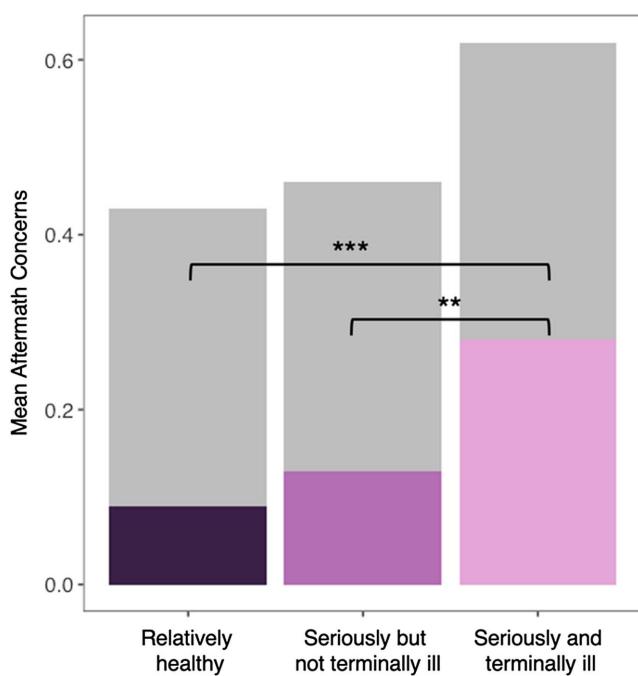
While cancer is not something individuals expect to face at any point in the lifespan, it does become more common in the second half of life (CDC, 2021). Facing a potentially life-threatening illness, like cancer, may prompt crafting one's legacy as part of the process of death preparation. Communion is a long-studied psychosocial construct capturing motivations toward bonding and relating to close others (McAdams et al., 1996). Overall, we found that communion was a central, important aspect of most individuals' legacies. More than 92% of the sample included at least one instance of communion in their legacy. Particularly though, those potentially facing early death (i.e., more potential years of life to lose) infused their legacies with even more communion, more love and care for others. This finding may reflect that individuals close to midlife, expecting a lot of life ahead of them, are embedded in a great number of roles and systems (e.g., children, aging parents, work colleagues). This full slate of activities and responsibilities (Lachman et al., 2015) may prompt personal consideration of what will happen when they must relinquish these roles due to sickness or death. In contrast, individuals in late life (i.e., already lived beyond life expectancy) have a different lifespan context: In their life phase, they may have fewer social obligations, dependents, or work roles that they will exit on death.

In addition to individuals' life phase, as predicted, acknowledgment of illness also played a role. The relation between off-time diagnosis and expressing communion in one's legacy emerged most strongly for those who were able to acknowledge that their cancer was a serious and terminal condition. One interpretation of this pattern is that individuals facing an early, off-time mortality threat have not considered legacy and death preparation because mortality is unexpected in this life phase (Liao & Carstensen, 2018; Neugarten, 1979). At their point in the lifespan, though they may be aware of shifting time horizons, they are unlikely to see future time as short or finite (Demiray & Bluck, 2014) unless they fully acknowledge their illness and its implications for life's ending.

In contrast, participants who had already lived many years beyond life expectancy did not benefit, in terms of the level of communion in their legacy, from terminal illness acknowledgment. Participants closer to the normative end of life (i.e., at or over life expectancy) may have already considered their mortality as part of the normative developmental process of awareness of shifting time horizons (Carstensen, 2021). This may have led them to express communal feelings for others across the years, before receiving their serious cancer diagnosis. For example, in the present study, participants were asked if they had any instructions they might like to offer their family to help prepare them for the future. One participant who had lived many years beyond national life expectancy stated: "No, you know what? My children, my four children, are very well—they know how to take care of themselves. They've grown up to have so much responsibility." In this example, the participant's confidence in her children's ability to carry on without her resulted in a response that did not show communion. Such a scenario may be less likely for participants closer to midlife whose children are likely younger and less clearly established. Accordingly, such individuals may respond to the same interview question by giving specific instructions of care and concern for their adult children's continuing welfare (i.e., greater communion narration).

An important consideration underscoring these results is that more participants with Stage 4 cancer diagnoses rated themselves "relatively healthy" than "seriously and terminally ill." One possibility is that these individuals may be engaging in social

Figure 3
Frequency of Aftermath Concerns According to Illness Acknowledgment



Note. The grey bar represents the mean communion in the legacies narrated by each group. Colored bars indicate the mean aftermath concerns narrated by each group. See the online article for the color version of this figure.
** $p < .01$. *** $p < .001$.

comparison based on how well they perceive themselves doing in relation to other cancer patients. Another possibility is that these individuals are engaging in a temporal comparison of how they felt during other parts of their treatment or illness. Given that outpatient palliative care is focused on pain management, these individuals may feel better at the time of measurement than they did during other parts of treatment. Last, these results may reflect denial about their health status. Future work investigating how individuals construct their illness acknowledgment response would be beneficial given that there are significant implications of denial on psychological well-being for individuals with cancer that may not have as much bearing for individuals who rated themselves as relatively healthy due to temporal comparison (e.g., Vos & de Haes, 2007).

Extending the Construct of Communion: Aftermath Concerns

Our findings demonstrate that communion manifests in its classic forms (McAdams et al., 1996) representing positive relations, such as loving and caring for others. We suggest that, particularly in the second half of life, considerations of communion may entail not only one's past or present social relations but imagining a future in which loved one's lives continue, after one's own death. To capture that, we expanded the standard conceptualization of communion by introducing the construct of aftermath concerns (Chochinov, 2004). We view aftermath concerns as a novel aspect of communion that is important to research on aging and particularly end-of-life. Dealing with one's own personal aftermath concerns is part of the personal closure needed in death preparation (e.g., Ray et al., 2006). In the current research, we thus developed and utilized narrative coding of aftermath concerns to deepen our examination of communion in legacies.

Acknowledgment of one's terminally ill status was related to higher communion for those whose lives were likely to be cut short by their illness. Beyond that, however, we identified that a higher level of communion was due to narrating more aftermath concerns in one's legacy. Notably, aftermath concerns sometimes add emotional complexity to individuals' legacies: they are not always unambiguously positive like other forms of communion. Classic communion coding encompasses positive relations: the love and care one has for close others (McAdams et al., 1996). While aftermath concerns sometimes manifested as these positive, warm feelings participants wished for their loved ones beyond their death (e.g., "I want my family to know my love for them goes on even once I'm dead."), those warm feelings were sometimes expressed in tandem with worries, and feelings of lack of control over how things will be for important others after one's death.

These ambivalent feelings may manifest as a reasonable reaction to knowing that one's illness and eventual death involve withdrawal from social relations that have been important, sometimes across decades or a lifetime. For example, one participant expressed an aftermath concern characterized by worry that his family would be emotionally overwhelmed by his death as he had seen this happen after his brother's passing. Bereaved families may often experience this sort of distress from not sufficiently talking about death with their dying loved one (Mori et al., 2017). Participants in the current research knew that their legacy narratives would be transcribed and shared with loved ones of their choosing (Chochinov, 2011). Voicing aftermath concerns may be part of leaving a legacy that is

authentic and helps the participant prepare their loved ones for their death.

Aftermath concerns that show mixed emotion may also reflect *intergenerational ambivalence*, the notion that relationships between aging parents and their adult children may not be exclusively positive (e.g., Connidis, 2015). For example, tensions can emerge between aging parents and adult children who are facing financial problems that require new job or career directions, or needing to move back home (Hammersmith, 2019). If the aging parent receives a diagnosis during time of transition for their adult child, their legacy may reflect not only love and care but tension in relation to whether the adult child will thrive after their death. This is exemplified in the present study by one participant describing an aftermath concern about her daughter:

I want her happy. She'd have a hard time, because she relies on me a lot, but I want her happy. I'm hoping that her boyfriend can maybe get some help, because he was on disability. They ended up cutting it off and I guess he's gonna have to try to fight for it again.

In this example, the participant is reflecting on positive aspects of her daughter and their relationship while also weaving in genuine concerns about her daughter's well-being should she have only her boyfriend to rely on.

In sum, we introduce aftermath concerns as an aspect of communion that can be reliably coded from narrative data. This offers a new method for capturing the long-standing construct of communion in the context of considering relations with others after one's death, including emotionally complex or ambivalent aspects of care and concern for others one will leave behind.

Limitations

Our sample was relatively gender-balanced but predominantly included White participants. Race and ethnicity, as well as gender, were considered in calculating the potential years of life to lose variable. There was not, however, sufficient power to test for moderation effects of race and ethnicity in the obtained pattern of findings. Prior research has found race and ethnicity differences in the acknowledgment of illness (Smith et al., 2008), a variable related to the narration of communion in legacies in the present study. In addition, the expression of communion and aftermath concerns may depend on varying values and family structures that align with race and ethnicity (Hayslip et al., 2019). Examination of factors affecting the construction of legacy in diverse samples is a rich area for future research.

Although we derived the potential years of life lost variable to advance analyses beyond only chronological age in the present study, we acknowledge that this variable is only an approximation of time until an individual might die. This line of research builds upon existing work on variables like future time perspective (Carstensen, 2021) and future possible selves (Ryff, 1991) by adding an element of how "expected" or off-time one's death may be, and how the impact of off-time change may affect developmental outcomes (Neugarten, 1979). Moving forward, a more nuanced approach to the variable may be one that better takes into the psychological components involved in one's perception of their time until death and its developmental timing. While most people may not regularly reflect on their relation to the national life expectancy for their demographic group, it is likely that people do reflect on personal information, such as their family health history and smoking behaviors, that may contribute to their time until death expectations.

In addition to capturing developmental pressures, it is possible that potential years of life lost acted as a proxy for capturing family context (e.g., children as dependents in the home). It is possible that family contexts in which participants had more dependent family members in the home may have driven outcomes like communion and aftermath concerns. However, the present study lacks sufficient data to tease apart the effects of specific family contexts from potential years of life lost. Future research examining the potential interplay between these variables would deepen understanding of the developmental pressures of facing death off-time.

Another consideration about the present sample that may be seen as a limitation is that we studied adults in the second half of life with a serious and terminal cancer diagnosis. It was a privilege to work with this relatively large, national, difficult-to-recruit sample. That said, our findings are relevant only to those facing serious and terminal cancer in later life, not to older adults who are healthy but may be thinking about or creating a psychosocial legacy. Further, our sample was recruited with an age selection criterion of 55 years of age or older, which limits our ability to comment on late midlife effects rather than the full developmental midlife period. Given present findings, we propose that legacy and aftermath effects in the event of serious and terminal cancer may be even stronger for those adults in early midlife, but we cannot test this hypothesis with present data. Future research is needed to fully understand the effect of potential years of life lost in the second half of life, from midlife to old age. Relatedly, we acknowledge that the nature of the sample does not allow differentiation between life phase and cohort effects.

Conclusion

Communion, caring relations with others, has long been studied as a vital part of life across the lifespan. Leaving a communion-rich legacy is a major developmental task in the second half of life, particularly in preparing for death. Our findings show that those facing an early, off-time, mortality threat from cancer particularly focus on communion during legacy narration. The sense that life is being cut short and one has not prepared loved ones, or expressed sufficient care and concern, may be partially addressed by leaving a warm, caring legacy full of instructions and lessons for those one will leave behind. Doing so, however, relies to some extent on the ability to acknowledge the seriousness of one's illness including that it may be terminal. Though we live in a society in which talking about death is still taboo, acknowledging the length of time one has left in life may help individuals prepare themselves and their close others accordingly.

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