9-5-2017

Changing Attitudes Toward Euthanasia and Suicide for Terminally Ill Persons, 1977 to 2016: An Age-Period-Cohort Analysis

Brandon K. Attell

OMEGA—Journal of Death and Dying
0(0) 1–25

DOI: 10.1177/0030222817729612
journals.sagepub.com/home/ome
SAGE

Changing Attitudes Toward Euthanasia and Suicide for Terminally Ill Persons, 1977 to 2016: An Age-Period-Cohort Analysis

Brandon K. Attell[1]

Abstract

Several longitudinal studies show that over time the American public has become more approving of euthanasia and suicide for terminally ill persons. Yet, these previous findings are limited because they derive from biased estimates of disaggregated hierarchical data. Using insights from life course sociological theory and cross-classified logistic regression models, I better account for this liberalization process by disentangling the age, period, and cohort effects that contribute to longitudinal changes in these attitudes. The results of the analysis point toward a continued liberalization of both attitudes over time, although the magnitude of change was greater for suicide compared with euthanasia. More fluctuation in the probability of supporting both measures was exhibited for the age and period effects over the cohort effects. In addition, age-based differences in supporting both measures were found between men and women and various religious affiliations.

Keywords

euthanasia, physician-assisted suicide, suicide, longitudinal research, general social survey

[1]Georgia Health Policy Center, Georgia State University, Atlanta, GA, USA

Corresponding Author:
Brandon K. Attell, Georgia Health Policy Center, Georgia State University, P.O. Box 3992, Atlanta, GA 30302-5020, USA.
Email: battell1@gsu.edu

Introduction

In 1997, Oregon made U.S. history by becoming the first state to enact legislation that legally permitted physicians to prescribe medication to terminally ill persons that would end their life. In regard to the legislation, termed the Death with Dignity Act, attitudes mattered. The legislation barely passed voter approval with a rate of 51% (Curran, 1998). Following the foundation set in place by the Oregon Death with Dignity Act, voters in Washington in 2008 legalized the Washington Death with Dignity Act with an approval rate of almost 58%. In 2009 in Montana and 2014 in New Mexico, state Supreme Courts ruled that physicians who help individuals requesting compassionate care at the end of life are not violating public policy. In 2013, the state of Vermont legislature passed the Patient Choice and Control at End of Life Act, which gave physicians legal rights to prescribe life-ending medication to individuals with terminal illnesses. Most recently, between 2015 and 2016, California, Colorado, and Washington, DC, all legalized physician-assisted suicide.

Seven states and Washington, DC, now legally allow for physician aide in the ending of life, which represents a liberalization of attitudes toward euthanasia and suicide for terminally ill persons. Indeed, the passage of legislature alongside the hearings of state Supreme Courts reflects a growing approval of personal control over the end of life, especially when individuals are terminally ill. Unfortunately, there is little research that documents and explains these trends. Most research to date has primarily considered cross-sectional demographic determinants of these attitudes. Very few studies exist regarding longitudinal changes in attitudes toward euthanasia and suicide for terminally ill persons. This dearth of literature raises important questions such as what exactly are the trends over time, especially in recent years when more states have approved physician-assisted suicide and for which demographic groups do attitudes change the most. Using cumulative data from the 1977 to 2016 general social survey (GSS), I contribute to the body of literature on attitudes toward euthanasia and suicide for terminally ill persons in several ways. First, my analysis adds an additional 11 years of survey data to the existing longitudinal trend research on this topic. Second, I more accurately decompose social change in these attitudes over time by simultaneously examining how age, period, and cohort effects work in concert to shape public opinion toward euthanasia and suicide. Third, I determine if previously found cross-sectional demographic determinants of attitudes toward euthanasia and suicide such as sex, race, education, or political affiliation remain significant in the longitudinal context.

Previous Attitudinal Research

Early research on attitudes toward euthanasia and suicide for terminally ill persons began by documenting cross-sectional demographic correlates. In 1977, the GSS, a nationally representative sample of the American public's

opinion on a variety of topics, included several measures asking respondents about their attitudes toward euthanasia and suicide for terminally ill persons. Two years later, in 1979, Singh used the 1977 GSS data to publish the first empirical article on attitudinal correlates, focusing on how sociodemographic and socioeconomic characteristics, religious and political ideology, and geographic region predict attitudes toward euthanasia and suicide for terminally ill persons. Stated broadly, Singh (1979) found that as age increased, approval of euthanasia and suicide decreased; men and those who were White were more approving of euthanasia and suicide; increased income and education positively affected attitudes; approval for both measures was higher for non-Catholics; and those living in New England, the Pacific region, and the Mountain region all expressed higher approval rates.

Previous research also finds that attitudes toward euthanasia and suicide for terminally ill persons vary by sex, race, educational attainment, political affiliation, and religious ideology. Compared with men, women are less likely to support euthanasia or suicide for terminally ill persons (DeCesare, 2000; Finlay, 1985). Whites are more likely than Blacks and ''other races'' to approve of euthanasia and suicide for terminally ill persons, which most scholars attribute to the historical mistrust that non-Whites have toward the medical profession (DeCesare, 2000; Jorgenson & Neubecker, 1980; Lichtenstein, Alcser, Corning, Bachman, & Doukas, 1997; Wasserman, Clair, & Ritchey, 2006). Contrary to the preliminary evidence provided by Singh (1979), in regard to education, additional research shows that an inverse relationship exists in which approval toward the voluntary taking of life decreases as educational attainment increases (Blackhall et al., 1999; Finlay, 1985). This is likely because higher education reflects social class positions in which individuals have better access to medical care and treatment (Braveman, Egerter, & Williams, 2011). In addition, individuals who identify as democrats or liberals, rather than as republicans or conservatives, are the most supportive of euthanasia and suicide for terminally ill persons (DeCesare, 2000). Finally, because of the ideological commitments associated with religion, religious affiliation also has strong connections to the voluntary taking of life. Compared with Protestants, Catholics, or Jewish individuals, those who report no religious affiliation have the greatest approval of suicide and euthanasia for terminally ill persons (Burdette, Hill, & Moulton, 2005; DeCesare, 2000).

Alongside research documenting these demographic correlates, a parallel body of empirical studies examines longitudinal changes in attitudes toward euthanasia and suicide for terminally ill persons. Perhaps the earliest was a comparison of several nationally representative surveys conducted by Benson (1999), who found an overall liberalization of attitudes toward these social phenomena. When it comes to attitudes toward euthanasia, data from Gallup (a private firm that researches trends in public attitudes, among other topics) reveal a significant trend: In 1947, only 37% of individuals stated that euthanasia should

be allowed, but by 1996, this number increased to 69% (Benson, 1999). Data from the GSS reveal a similar trend: In 1977, 60% of individuals stated that euthanasia should be allowed, and by 1998, approval rates increased slightly to 68% (Benson, 1999). Regarding suicide for terminally ill persons, GSS data demonstrate a sea change of support: In 1977, only 38% of individuals agreed that a person has the right to end his or her own life if they have an incurable disease (Benson, 1999). By 1998, the percentage of those in support for suicide jumped to 61% (Benson, 1999).

In 2000, DeCesare replicated Singh's classic (1979) study of attitudes toward euthanasia and suicide for terminally ill persons. Utilizing the same coding schemes and statistical methods, DeCesare carried out a separate but identical analysis on 1996 GSS data to determine whether and how the effects of demographic correlates have changed over time. DeCesare's findings mirror the trends outlined by Benson (1999): Approval of euthanasia increased from 62.4% in 1977 to 70.4% in 1996, and approval of suicide for terminally ill persons increased from 39.6% of individuals in 1977 to 65.8% of individuals in 1996 (DeCesare, 2000). Using the two endpoints of 1977 and 1996 in separate regression models, DeCesare then determined that the demographic correlates of attitudes toward euthanasia and suicide for terminally ill persons largely remained the same.

In a follow up to Benson (1999), Allen et al. (2006) utilized Gallup data and report a longer time-period trend: In 1936, 46% of individuals approved of euthanasia for terminally ill persons, but by the year 2002, that number had increased to 72%. Utilizing GSS data, Moulton, Hill, and Burdette (2006) analyzed attitudes toward euthanasia from 1977 to 2004. Although Moulton et al. (2006) do not report specific rates of approval of euthanasia, they do state that "with the exception of spikes in opposition during the late 1970s/early 1980s and the early 1990s, attitudes toward euthanasia have remained fairly stable since the early 1970s" (p. 259). Moulton et al. took their analysis a step further than the existing trend research by decomposing the longitudinal effect of religious ideology on attitudes toward euthanasia. The results of their analysis indicate that across all religious denominations monitored by the GSS, attitudes toward euthanasia significantly liberalized over time, with moderate Protestants exhibiting the most change over time.

Perhaps the most comprehensive analysis to date of longitudinal trends in attitudes toward euthanasia and suicide for terminally ill persons has been carried out by Duncan and Parmelee (2006) utilizing GSS data from 1977 to 2002. Their findings on approval rates of euthanasia and suicide mirror those of other research (e.g., Allen et al., 2006; Benson, 1999; DeCesare, 2000; Moulton et al., 2006), indicating an increase in support of euthanasia and suicide for terminally ill persons from 1977 onward. However, their unique contribution rests in their cohort analysis of the "old, middle, and new" birth cohorts, respectively, representing individuals born: before 1924, between 1924 and 1959, and after 1959

(Duncan & Paremelee, 2006). The main findings of their cohort analysis indicate that the approval trends for those in the *middle* birth cohort are almost identical to the aggregate trends that do not take cohort into account; the highest rates of approval on both measures are from individuals in the *new* birth cohort; and across all three cohorts, there exists a rapid increase in approval of suicide for terminally ill persons from 1977 to the late 1980s, while the acceptance of euthanasia for terminally ill persons grows much slower across the same time period (Duncan & Paremelee, 2006).

Taken together, there are several conclusions that can be drawn regarding social change in attitudes toward euthanasia and suicide for terminally ill persons. First, public approval on both measures has increased over time, although the magnitude of the increase over time is greater for suicide for terminally ill persons. Second, when utilizing pooled analytic techniques, as is the case with the Moulton et al. (2006), demographic correlates change over time, as made evident by the increasing liberalization of attitudes across all religious groups. Third, cohorts play an important role in shaping attitudes toward euthanasia and suicide for terminally ill persons, with those in a younger cohort showing higher approval rates on both measures compared with those in the older cohort.

Limitations of Previous Research

While this body of previous research is important in examining attitudes toward euthanasia and suicide for terminally ill persons, there are several methodological issues that warrant discussion. The structure of the responses to the GSS questions about euthanasia and suicide for terminally ill persons is dichotomous. A dichotomous response structure can be described as answers to a question that only have two options, in this case yes or no. In statistical analyses, dichotomous dependent variables require special consideration regarding hypothesis testing. Both Singh (1979) and DeCesare (2000) model the relationship between demographic variables and attitudes toward euthanasia and suicide for terminally ill persons using ordinary least squares (OLS) regression. OLS regression is not appropriate for modeling dichotomous dependent variables because two of the assumptions of OLS regression are a univariate normal distribution of scores on the dependent variable and linear relationships between independent and dependent variables. The dichotomous structure of responses to the GSS euthanasia and suicide questions violates these assumptions of OLS regression because they take on the shape of a logistic s-shaped curve, and are therefore nonnormally distributed and nonlinear. The results of the analyses carried out by Singh (1979) and DeCesare (2000) are therefore biased and should have been properly modeled using binary logistic regression.

In addition, almost all the longitudinal research to date on this topic has not statistically accounted for change over time. The researches carried out by

Benson (1999), Allen et al. (2006), and Duncan and Parmelee (2006) are descriptive statistics that describe percentage change over time, rather than inferential statistics that account for contributors to change over time, such as race or gender, or determine if yearly changes in attitudes are significantly different from one another. Indeed, these studies (Allen et al., 2006; Benson, 1999; Duncan & Paremelee, 2006) demonstrate that attitudes have changed over time, but do not determine whether time predicts the likelihood of supporting or not supporting euthanasia or suicide.

One exception is the findings of Moulton et al. (2006), who account for the survey year in their multivariable binary logistic analysis of attitudes toward euthanasia and suicide. However, they treat year of survey as an individual-level variable, which ignores the hierarchical structure of the data. Properly accounting for the year of survey requires a multilevel statistical approach in which individuals are nested within survey years. Accordingly, the treatment of year of survey as an individual-level variable is a disaggregation of the hierarchically structured data. Disaggregation of hierarchically structured data typically results in false positive tests of statistical significance (Snijders & Bosker, 2012), yielding inappropriate conclusions about the relationship between the two variables tested. Accordingly, the year of survey measure analyzed by Moulton et al. (2006) should have been modeled in a multilevel framework.

Furthermore, the most recent longitudinal research on attitudes toward euthanasia and suicide for terminally ill persons (Moulton et al., 2006) ends with data from the 2004 GSS. The most recently available data from the GSS include samples from 2006, 2008, 2010, 2012, 2014, and 2016. Thus, it is important to understand whether attitudes toward euthanasia and suicide for terminally ill persons changed since 2004, particularly considering the number of states that have passed death with dignity laws since that time. This analysis will also update our understanding of—in addition to religious ideology—whether the effects of other demographic correlates remain significant when controlling for broader societal changes in these attitudes.

Theoretical Perspective

A life course theoretical perspective is particularly useful for examining social change over time. In general, the life course perspective consists of several central themes: "the interplay of human lives and historical times, the timing of lives, linked or interdependent lives, and human agency in choice making" (Elder, 1994, p. 5). The life course perspective does not necessarily encompass a single theory, but rather a paradigm of theoretical assumptions that account for social change over an individual's life in concert with the broader sociohistorical context (Elder, 1998). Three such assumptions are that social change: (a) occurs between and within cohorts, (b) takes place over an extended

time period, and (c) is determined by one's social location across a variety of domains (Mayer, 2009).

Cohort is of central importance in the sociological study of change over time. The term *cohort* refers to a group of individuals who collectively experience some event at the same time (Ryder, 1965). The most commonly used cohort in the study of social change over time is the birth cohort, or all individuals born in a given year or set of years (Glenn, 2005). The birth cohort is an important determinant of individuals' attitudes toward social phenomena because the timing of birth provides an anchoring frame of reference and worldview unique to that cohort that shape attitudes and opinions toward various social phenomena (Alwin & McCammon, 2003). For example, individuals born during the great depression who experienced childhood poverty are likely to hold different viewpoints on social security and social welfare policy compared with individuals born during the post world war II era, when the United States experienced an economic boom on many fronts.

Because each cohort is born in its own milieu, cohorts may differ from one another in terms of their attitudes. As newly born individuals replace those who pass away from previous cohorts, they likely bring new ideas, opinions, and attitudes to society—a process that Ryder (1965) terms "demographic metabolism," also known as "cohort succession" (Firebaugh, 1997). For instance, individuals in newer birth cohorts belong to a generation of declining trust in the medical profession (e.g., see Blendon, Benson, & Hero, 2014), compared with individuals in older birth cohorts who witnessed the rise of medical authority and power (Starr, 1982). Attitudes toward euthanasia and suicide for terminally ill persons may also vary directly as a function of these cohort differences in generational attitudes.

Although birth cohort membership is one way attitudes may change over time, there are two additional temporal parameters that may account for change over time. The first of those is age. Age is an important determinant of attitudes because as individuals live longer, they experience more formative life events that shape their beliefs and opinions (Elder, 1994). Accordingly, as members of any given cohort become older, it is likely that their opinions and attitudes toward social phenomena change. Age is particularly important in understanding attitudes toward euthanasia and suicide for terminally ill persons because the transition to late adulthood is when most individuals experience the onset of multimorbidity, relinquish previously held roles or statuses, and shift their attention to the management of chronic conditions (Bury, 1982; Marengoni et al., 2011). Attitudes toward euthanasia and suicide for terminally ill persons will be especially important during this time as older adults contemplate end of life care, compared with younger adults who may not yet be confronting these issues.

The third temporal parameter that may account for attitudinal change over time includes exposure to events that life course sociologists call period effects.

Period effects can be thought of as exposure to historical events over time that impact the attitudes of all the people who experience them—largely independent of their age or cohort membership. To date, previous research on attitudes toward euthanasia and suicide for terminally ill persons has largely ignored the role of passing time in contributing to attitudinal change. It is plausible that major historical events in the right to die movement, such as the passage of the Oregon Death with Dignity Act, were key in shaping public opinion toward euthanasia and suicide for terminally ill persons. Therefore, period effects are included in my analysis to account for these important moments of history.

Age, period, and cohort effects are synergistic and work together in a longitudinal nature to account for social change over time. That is, trends in societal attitudes cannot be assessed at one point in time, but rather must be accounted for using longitudinal data that can account for age, period, and cohort effects (Glenn, 2005). Said another way, to fully understand that nature of change over time, it is necessary to consider all three temporal parameters (i.e., age, period, and cohort). Failure to account for all three parameters may lead to incorrect inferences as to why change is occurring over time.

Methods

The data for this research come from the cumulative 1977 to 2016 GSS. The GSS monitors public opinion and social change through periodic surveys using a national probability sample of all English speaking noninstitutionalized individuals 18 years of age and older living in the United States. The GSS began as an annual survey of the U.S. public in 1972 and in 1994 switched to a biannual survey design. The analysis is restricted to only the years containing focal variables of interest and therefore does not include the 1972 to 1976 annual survey years, and the 1980, 1984, and 1987 survey years. Pooling the available data for years 1977 to 2016 creates a data set of 23 cross-sectional, nationally representative surveys ($N = 62{,}466$ prior to listwise deletion), which are ideal for use in age-period-cohort (APC) analyses (Yang & Land, 2006). The analysis was limited to those individuals with nonmissing values on all study variables ($N = 30{,}319$).

APC Analysis

APC analyses have a long-standing history in the development of longitudinal research on attitudinal trends. Their early appeal was to social scientists interested in studying the effects of aging, where traditional experimental methods in the laboratory could not capture the longitudinal effects of age on attitudinal measures (Glenn, 2005). Social scientists interested in the process of aging and attitudinal change foundered with the use of the cross-sectional survey as well,

because "differences by age shown by cross-sectional data may or may not be age effects, because the people of different ages are members of different cohorts and may have been shaped by different formative experiences and influences" (Glenn, 2005, p. 3). APC analysis was developed, therefore, to surpass the problems associated with cross-sectional findings and to decompose longitudinal change by accounting for the unique role that age effects, period effects, and cohort effects have in shaping public opinion.

From its inception, APC analysis has suffered from what is referred to as the "identification problem." The identification problem refers to the situation in which variance in the dependent variable of interest cannot be explained because the independent variables are linear functions of one another. Regarding APC analysis, for example, an individual's birth cohort is a linear function of their age and survey year (birth cohort=survey year−age). Vice versa, age is a linear function of birth cohort and survey year (age=survey year−birth cohort). Because the variables are linear functions of one another, they will be perfectly collinear and therefore their effects cannot be simultaneously estimated (Warner, 2013). Accordingly, simultaneously estimating these effects requires special statistical models that until recently have been unavailable (Yang & Land, 2006).

In this analysis, the APC methods outlined by Yang (2008) and Yang and Land (2006) are utilized to examine changing attitudes toward euthanasia and suicide for terminally ill persons. Yang and Land circumvent the identification problem by estimating age, period, and cohort effects utilizing generalized linear mixed modeling, specifically cross-classified mixed effects modeling. Unlike traditional hierarchical models, cross-classified models take into account that individuals can be nested within multiple higher order structures, but that those higher order structures are not necessarily nested within one another (Raudenbush & Bryk, 2002). In the case of the APC model, the cross-classified design addresses the issue that some members of Cohort A will be alive during period or Year Z, and some members of Cohort A will be alive during period or Year W. However, members of other cohorts (e.g., Cohorts B and C) will also be alive during periods or Years Z and W (Yang & Land, 2008).

Dependent Variables

There are two dependent variables in this analysis. The first is a measure of public opinion on euthanasia. During data collection, respondents were asked the following question: "When a person has a disease that cannot be cured, do you think doctors should be allowed by law to end the patient's life by some painless means if the patient and his family request it?" The second dependent variable asks participants: "Do you think a person has the right to end his or her own life if this person has an incurable disease?" Both variables are coded as dichotomous indicators, where 0 represents a response of *no* and 1 represents a response of *yes*.

APC Variables

APC analysis relies on variables that measure individuals' age at the time of survey, indicators for the period in which the survey was administered, and a cohort measure that partitions individuals into conceptually related groups. Three variables are used, respectively, to properly specify the APC analysis. *Age* is a ratio level variable measured by the age in years of the respondent at the time of the interview. *Year* is the period indicator, in this case, the year in which each cross-sectional survey was administered. Finally, *cohort* refers to the sorting of individuals into intervals of 5-year birth cohorts. The 5-year grouping is convention in most APC analyses to ensure enough statistical power to detect cohort-based differences (Costanza, Darrow, Yost, & Severt, 2017). The grouping also helps with breaking the linear dependency among age, period, and cohort and as Donnelly et al. (2016) argue "provides the best compromise between specificity and breadth" (p. 45).

Control Variables

Based on the previous research discussed earlier, several demographic variables were employed as control measures. *Female* is an indicator of the variable sex that represents all women present in each of the cross-sectional surveys, while *male* represents all men present. *Male* is the reference category for these two indicators. The GSS race variable was trichotomized to create three dummy coded indicators for *White race, Black race*, and *other race*.[1] *White race* is the reference category for the race indicators. A measure of educational attainment was also included, where *education* represents each year of formal schooling the respondent has completed. The education variable was top coded at 20 years by the GSS. Four indicators represent political affiliation: *Democrat*, *Republican*, *Independent*, *and other party* with *democrat* as the reference category. Finally, religious affiliation was modeled with dummy coded indicators for *Protestant, Catholic*, *Jewish*, *other religion*, and *no religious affiliation*. For the religion indicators, *Protestant* is the reference category.

Analysis

This analysis begins by updating descriptive longitudinal trends in attitudes toward euthanasia and suicide for terminally ill persons with the addition of GSS data through 2016. Next, following the methods outlined by Yang (2006) and Yang and Land (2008), two-level cross-classified logistic regression models were employed to estimate longitudinal changes in attitudes toward euthanasia and suicide that are attributable to age, period, and cohort effects. Models 1a and 1b represent the baseline models without control variables, while Models 2a and 2b nest in the demographic controls discussed earlier. The models

with control variables were parameterized at Level 1 as:

$$\log\left[\frac{\varphi_{ijk}}{1-\varphi_{ijk}}\right] = \pi_{0jk} + \pi_{1jk}(Age_{ijk}) + \sum_{p}^{P} \mathbf{\Pi}_{pjk} \mathrm{A}_{pijk} \quad (1)$$

for
$i = 1, 2, 3, \ldots,$ 30,319 individuals cross-classified by period j and cohort k;
$j = 1, \ldots,$ 23 survey years;
$k = 1, \ldots,$ 21 5-year birth cohorts;
where φ_{ijk} represents the probability of supporting euthanasia or suicide for terminally ill persons, π_{0jk} represents the regression intercept, π_{1jk} represents the age effect, and $\mathbf{\Pi}_{pjk}$ represents the vector of effects for the control variables discussed earlier. At Level 2, the models were parameterized as:

$$\begin{cases} \pi_{0jk} = \theta_0 + b_{00j} + c_{00k} \\ \pi_{1jk} = \theta_1 \\ \mathbf{\Pi}_{pjk} = \mathbf{\Theta}_m \end{cases} \quad (2)$$

where θ_0 represents the log odds of agreeing to euthanasia or suicide when all variables in the model equal zero, θ_1 represents the Level 1 age effect which is modeled as fixed at Level 2, $\mathbf{\Theta}_m$ represents the vector of Level 1 control variables that are modeled as fixed at Level 2, and b_{00j} and c_{00k} represent the random period and cohort effects, respectively. All models were estimated using the lme4 package (Bates, Maechler, Bolker, & Walker, 2015) in R version 3.3.3 (R Core Team, 2017).

Results

Summary statistics for all variables in the analysis are presented in Table 1. A majority of individuals support both euthanasia (68%) and suicide for terminally ill persons (57%) across all survey years. The average age of respondents was 45.75 years ($SD = 17.43$ years), with the youngest person in the sample being 18 years of age and the oldest person in the sample being 89 years of age. There were more women (56%) than men (44%) in the sample. White individuals (81%) compromised the majority of the sample, followed by Black individuals (14%) and relatively few individuals reporting "other race" (5%). On average, individuals in this sample completed a high school education ($M = 12.98$ years, $SD = 3.11$ years). Almost half (49%) of the individuals were democrats, while 35% were republicans, 15% were independent, and 1% belonged to another political party. Over half of the individuals were Protestant (57%), while 24% were Catholic, 13% reported no religious preference, 2% were Jewish, and 4% reported belonging to another religion.

Table 1. Summary Statistics for All Variables in the Analysis ($N = 30{,}319$).

	Mean or proportion	*SD*	Minimum	Maximum
Dependent variables				
Euthanasia	0.68		0	1
Suicide	0.57		0	1
Level 1 variables				
Age	45.75	17.43	18	89
Female	0.56		0	1
Black	0.14		0	1
Other race	0.05		0	1
Education	12.98	3.11	0	20
Democrat	0.49		0	1
Independent	0.15		0	1
Other party	0.01		0	1
Protestant	0.57		0	1
Catholic	0.24		0	1
Jewish	0.02		0	1
No affiliation	0.12		0	1
Other religion	0.04		0	1
Level 2 variables		*N*	Minimum	Maximum
Period		23	1977	2016
Cohort		21	1888	1998

The 1977 to 2016 time-period trends for attitudes toward euthanasia and suicide for terminally ill persons are displayed graphically in Figure 1. The displayed trends represent the percentage of individuals in each survey year who support euthanasia or suicide. From 1977 to 1982, support for euthanasia declines from 62% to 58%. From 1983 (66% support) to 1998 (71% support), there is a stable increase in support for euthanasia, despite several small decreases in support in the years 1985 (65% support) and 1993 (68% support). Beginning in the year 2000, support for euthanasia drops slightly to 68%, where it remains relatively stable (fluctuating between 67% and 74%) until the year 2016. Overall, for the past 39 years, support for euthanasia for terminally ill persons has increased by 12 percentage points, from 62% in 1977 to 74% in 2016.

From 1977 to 1982, support for suicide increases from 39% to 43%. From 1983 (50% support) to 1998 (65% support), there is a stable increase in support for suicide, despite several small decreases in support in the years 1985 (46% support), 1989 (50% support), and 1993 (60% support). Support for suicide for

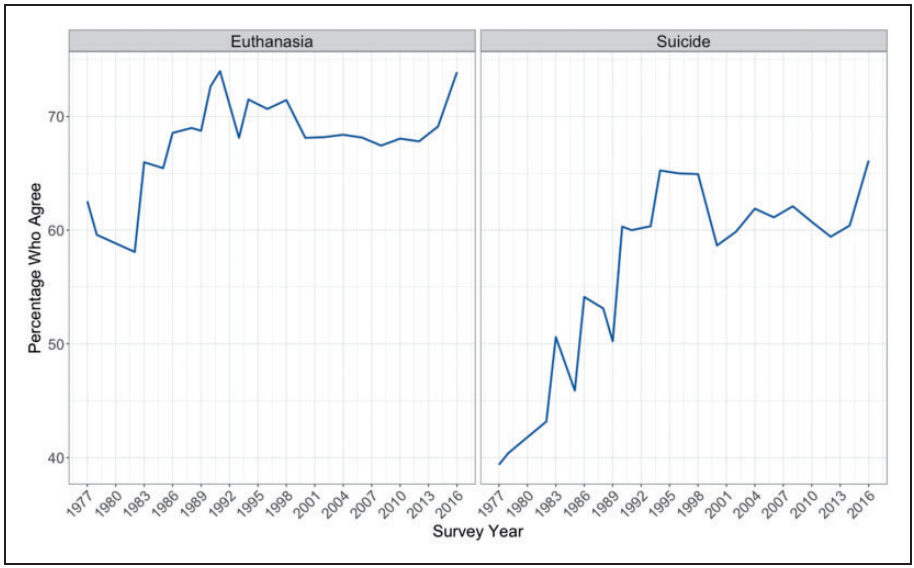

Figure 1. Agreement to euthanasia and suicide over time.

terminally ill persons drops between the years 1998 (65% support) and 2000 (58% support). However, beginning in the year 2002, support for suicide remains relatively stable, fluctuating between 59% and 66%. Overall, for the past 39 years support for suicide for terminally ill persons has increased by 27 percentage points, from 39% in 1977 to 66% in 2016.

To gain a better understanding of how age, period, and cohort effects work together to shape attitudes over time, the interactive nature of these variables is plotted in Figure 2. Each point in the plot represents for any given year the percentage of individuals in each birth cohort that agree to euthanasia or suicide, and each point is shaded to represent the average age of individuals in that cohort at the time of survey administration. Several interesting findings emerge. First, the between-cohort differences in agreement to both measures generally decrease over time, especially when comparing the two end points of 1977 and 2016. This is seen in the plot through the decreasing vertical dispersion of points over time, with more overlapping points in the later survey years. Second, approval of both measures generally increases over time, although there is much more consistent approval of euthanasia compared with suicide. Third, the groups of individuals that deviate from the broader societal trend tend to be birth cohorts where the average age is at the lower or upper extremes. This is most notable for the suicide measure, where many of the outlier cohorts are shaded red rather than blue. Finally, the groups that tend to be the most

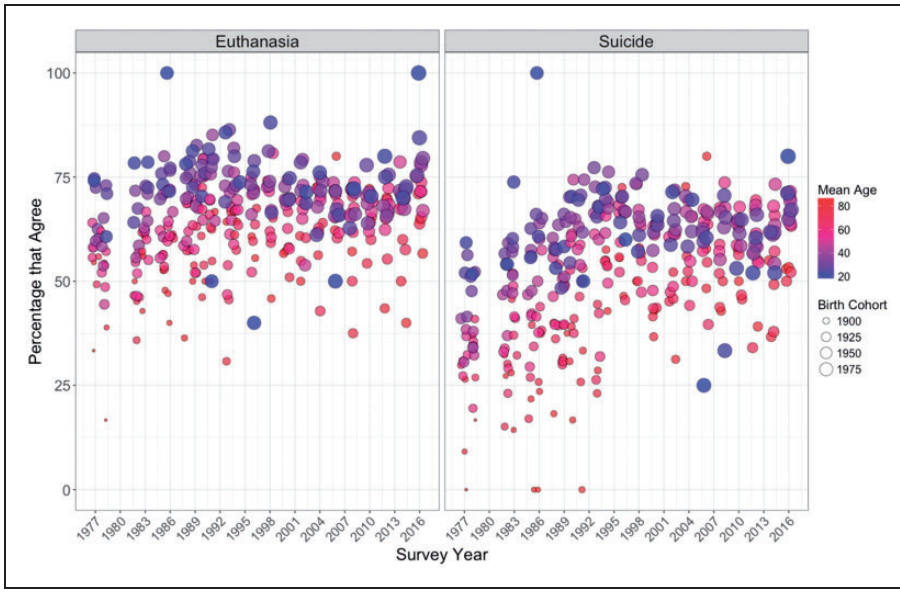

Figure 2. Agreement to euthanasia and suicide over time, scaled by birth cohort and average age.

approving of both measures are generally younger in nature. Indeed, moving upward along the *y* axis, the points gradually change from red to purple to blue.

The odds ratios from the APC models are displayed in Table 2. For the baseline models, there was a negative relationship between age and agreement to both measures, such that as individuals aged, they became less likely to support euthanasia ($OR = 0.28$, $p \leq .001$) and suicide ($OR = 0.26$, $p \leq .001$). This relationship is shown visually in Figure 3, which displays the probability of agreement to both measures as predicted from the baseline APC models. Regarding period effects as predicted by the model, for both euthanasia and suicide, there is a generally positive trend such that as time passes, the probability of supporting both measures increases. However, there is more fluctuation in this trend for support of suicide, especially during the mid-1980s to 2000. Regarding support for euthanasia, there is not much between cohort variation in the probability of agreement. Across birth cohorts, the probability of supporting euthanasia tends to hover around .80. However, much more variation in cohort effects are seen for the support of suicide, with somewhat of a negative curvilinear trend exhibited in the 1930s to 1960s cohorts.

Controlling for age, period, and cohort effects, women were less likely to agree to both euthanasia ($OR = 0.73$, $p < .001$) and suicide ($OR = 0.77$, $p < .001$) compared with men. Compared with White individuals, Black individuals were less likely to agree to euthanasia ($OR = 0.34$, $p < .001$) and suicide

Table 2. Odds Ratios From Age-Period-Cohort Models ($N = 30{,}319$).

	1a	1b	2a	2b	3a	3b	4a	4b
	Euthanasia baseline	Suicide baseline	Euthanasia with controls	Suicide with controls	Euthanasia with sex interactions	Suicide with sex interactions	Euthanasia with religion interactions	Suicide with religion interactions
Level 1 parameters								
Intercept	3.74***	2.15***	2.98***	0.71*	2.63***	0.61***	2.91***	0.73*
Age	0.28***	0.26***	0.33***	0.37***	0.43***	0.53***	0.35***	0.36***
Female (ref = male)			0.73***	0.77***	0.89	1.00	0.73***	0.77***
Black (ref = White)			0.34***	0.39***	0.34***	0.39***	0.34***	0.40***
Other race (ref = White)			0.68***	0.61***	0.68***	0.61***	0.67***	0.61***
Independent (ref = democrat)			0.77***	0.84***	0.77***	0.84***	0.77***	0.83***
Republican (ref = democrat)			0.67***	0.74***	0.67***	0.74***	0.67***	0.74***
Other party (ref = democrat)			0.74*	1.19	0.74*	1.19	0.74*	1.19
Education			1.60***	2.65***	1.60***	2.65***	1.59***	2.63***
Catholic (ref = Protestant)			0.97	0.99	0.97	0.99	0.51***	1.31**
Jewish (ref = Protestant)			2.32***	3.58***	2.23***	3.58***	1.97	2.34*
No affiliation (ref = Protestant)			2.74***	3.43***	2.75***	3.43***	1.95***	1.92***
Other religion (ref = Protestant)			1.16*	1.17*	1.16*	1.17*	0.92	0.78
Level 1 interaction effects								
Age × Sex					0.64**	0.55***		
Age × Catholic							0.51***	0.55***
Age × Jewish							1.26	2.16
Age × No affiliation							2.39**	4.33***
Age × Other religion							1.83	2.76*

(continued)

Table 2. Continued

	1a	1b	2a	2b	3a	3b	4a	4b
	Euthanasia baseline	Suicide baseline	Euthanasia with controls	Suicide with controls	Euthanasia with sex interactions	Suicide with sex interactions	Euthanasia with religion interactions	Suicide with religion interactions
Variance components								
Cohort	0.007	0.037	0.007	0.027	0.007	0.026	0.006	0.022
Period	0.031	0.115	0.024	0.083	0.024	0.082	0.025	0.085
Model fit								
Deviance	37,469	40,006	35,526	37,305	35,517	37,288	35,497	37,254
Akaike information criterion	37,476	40,014	35,556	37,335	35,549	37,320	35,535	37,292
Bayesian information criterion	37,510	40,047	35,681	37,460	35,682	37,454	35,693	37,450

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

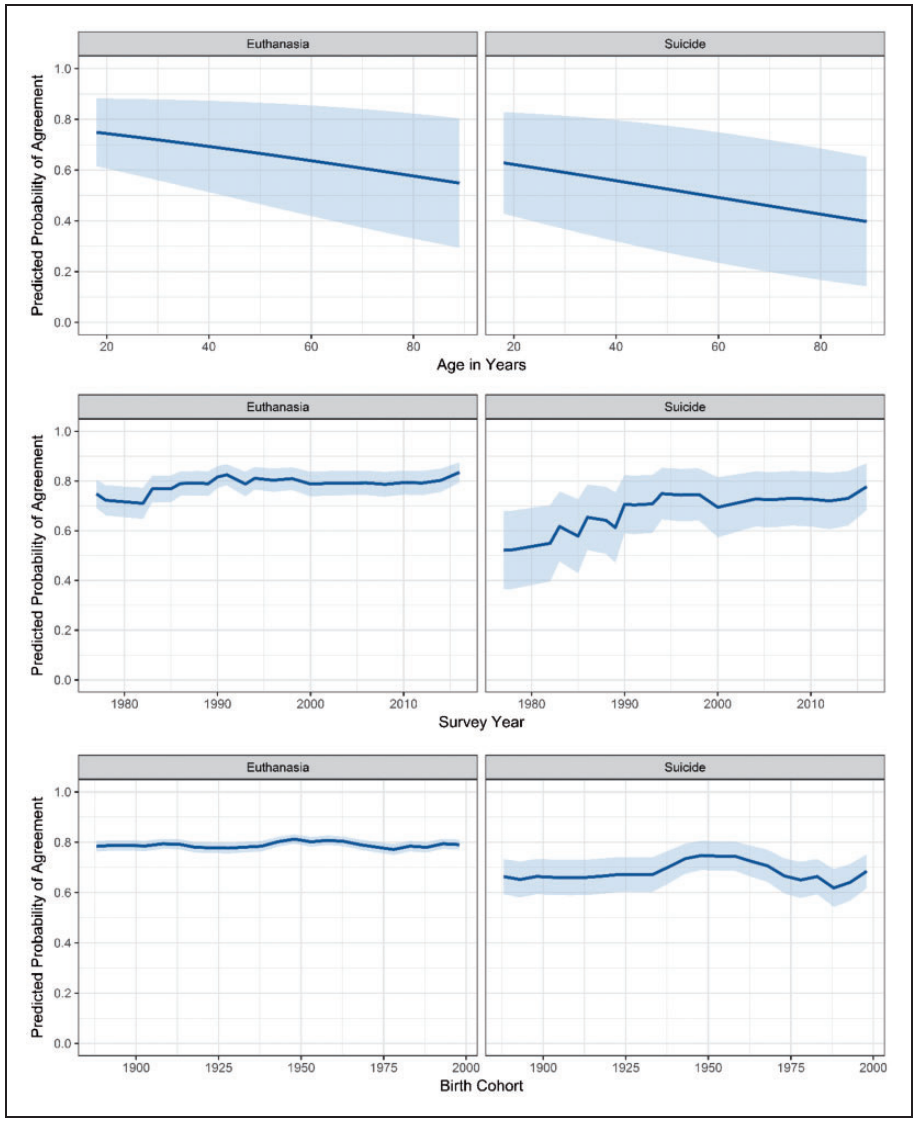

Figure 3. Age, period, and cohort effects for agreement to euthanasia and suicide.

($OR = 0.39$, $p < .001$). Compared with White individuals, other race individuals were less likely to agree to euthanasia ($OR = 0.68$, $p < .001$) and suicide ($OR = 0.61$, $p < .001$). Compared with democrats, independents were less likely to agree to euthanasia ($OR = 0.77$, $p < .001$) and suicide ($OR = 0.84$, $p < .001$).

Compared with democrats, republicans were less likely to agree to euthanasia ($OR = 0.67$, $p < .001$) and suicide ($OR = 0.74$, $p < .001$). Compared with democrats, other party individuals were less likely to agree to euthanasia ($OR = 0.86$, $p = .21$). As education increased, the likelihood of agreeing to both euthanasia ($OR = 1.60$, $p < .001$) and suicide ($OR = 2.65$, $p < .001$) also increased. Compared with Protestants, those who were Jewish were more likely to support euthanasia ($OR = 2.32$, $p < .001$) and suicide ($OR = 3.58$, $p < .001$). Compared with Protestants, those who reported no religious affiliation were more likely to support euthanasia ($OR = 2.74$, $p < .001$) and suicide ($OR = 3.43$, $p < .001$). In addition, compared with Protestants those who reported some other religious affiliation were more likely to support both euthanasia ($OR = 1.16$, $p < .05$) and suicide ($OR = 1.17$, $p < .05$).

As a follow-up analysis to the significant effects identified by the APC models with demographic controls, interaction effects between age and all of the demographic variables were tested. Any significant interaction effect would indicate differences in the probability of agreement to euthanasia or suicide as individuals' age, where these differences are dependent on the specific demographic measure being tested. Of all the demographic measures tested, significant interactions were found only for sex and religion. These effects are displayed in Table 2 and presented graphically in Figure 4. The results indicate that as men and women age, they diverge in their probability of supporting both euthanasia and suicide, with men consistently more likely to support both measures across the life course. There are also age-based differences in supporting both measures across religious affiliation. Compared with Protestants, those with no religious affiliation are more likely to support both measures across the life course. Compared with Protestants, Catholics are more likely to support both measures earlier in the life course and less likely beginning in their mid-40s. While there was not a significant difference between Protestants and those reporting "other religious affiliation" for agreement to euthanasia, the trend for suicide indicates that those affiliating with "other" religion hold more stable attitudes toward suicide as they age.

Discussion and Conclusion

The purpose of this study was to improve our understanding of attitudes toward euthanasia and suicide for terminally ill persons. For more than 30 years, scholars have utilized data from the GSS to examine how these attitudes vary as a function of demographic characteristics as well as how approval of euthanasia and suicide have changed over time. Using insights from life course sociological theory and recently developed cross-classified mixed effects logistic regression, I better account for longitudinal changes in these attitudes by disentangling the age, period, and cohort effects that contribute to attitudinal change over time.

Previous research on longitudinal change in these attitudes documents a liberalization process in which approval for euthanasia and suicide for terminally

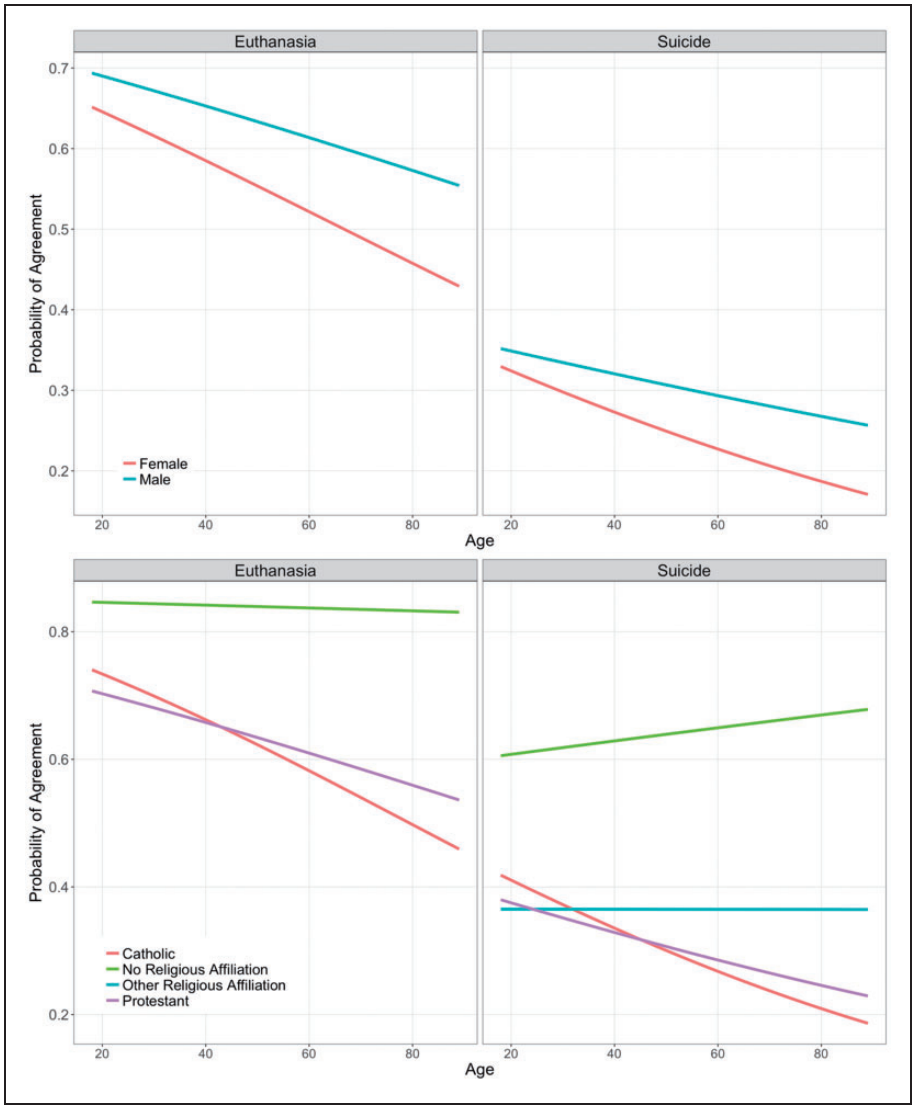

Figure 4. Probability of agreement to euthanasia and suicide by sex and religious affiliation.

Note. The upper panel represents probabilities to both measures derived from interaction effects between age and sex. The lower panel represents probabilities to both measures derived from interaction effects between age and religious affiliation.

ill persons generally increases from the 1970s onward (Allen et al., 2006; Benson, 1999; DeCesare, 2000; Duncan & Parmelee, 2006; Moulton et al., 2006). However, because the most recently published study regarding longitudinal change ends with data from 2004, an important question is do these attitudes continue to liberalize in recent years? Regarding euthanasia, 68% of individuals approve in 2004 and 74% of individuals approve in 2016, an increase in approval of 6%. Regarding suicide, 62% of individuals approve in 2004 and 66% of individuals approve in 2016, an increase in approval of 4%. Accordingly, one conclusion to be drawn is that while these attitudes have slightly liberalized during the 2004 to 2016 time period, the greatest fluctuation in rising approval for both measures occurred during the 1980s and 1990s (see Figure 1.)

There are two other important conclusions to be made about changes among these attitudes from 1977 to 2016. Foremost, across all survey years, public approval of euthanasia is higher than approval of suicide. There are two possible explanations for this trend. First, the societal stigma surrounding suicide in general may result in lower public approval even though both suicide and euthanasia result in the termination of life. Second, individuals may see death with the help of a physician as safer and more controlled than without the help of a physician and therefore be more approving of euthanasia than suicide. Another important conclusion is that from 1977 to 2016, the magnitude of the change in attitudes toward suicide is greater than that of the change in attitudes toward euthanasia. From 1977 to 2016, approval of suicide for terminally ill persons increases by 27 percentage points while approval of euthanasia increases by only 12 percentage points. While approval of euthanasia remains higher than suicide in all survey years, attitudes toward both measures converge over time, especially from 2000 onward (see Figure 1). There are at least two possible explanations for the observed increase in approval of suicide over time. The first is that there may be a relationship between both measures such that as more individuals became approving of euthanasia, suicide became more publicly acceptable. The second is that the trend may be part of the broader, historical liberalization of social attitudes in general. Indeed, many acts that used to be considered taboo or controversial have become more liberal over time. One salient example is the rising approval of same sex marriage documented across similar time periods and birth cohorts used in this study (Baunach, 2011, 2012).

Life course sociologists argue that broad social change is a result of the synergistic combination of age, period, and cohort effects. Age effects refer to attitudinal changes that arise as people move throughout various life stages and experience formative life events. Period effects account for the passing of time and can be thought of as those historical events that impact the attitudes of all the people who experience them—largely independent of their age or cohort membership. Cohort effects refer to attitudinal changes that result in differences of opinion between birth cohorts, which most notably arise as new birth cohorts

replace older birth cohorts in the population. While previous research has examined one or two of these effects at a time, this study is the first to fully examine how age, period, and cohort effects work together to influence longitudinal changes in attitudes toward euthanasia and suicide for terminally ill persons.

The effect of age on attitudes toward euthanasia and suicide for terminally ill persons can be summarized as a negative relationship. The results of this analysis indicate that even when controlling for period effect, cohort effects, and demographic measures, as individuals age their support for both measures generally decreases. Indeed, as individuals advance through each year of life, they become considerably less likely to support euthanasia and suicide for terminally ill persons.

Previous research examining how these attitudes change because of passing time is considerably limited. Many findings (Allen et al., 2006; Benson,1999; DeCesare, 2000; Duncan & Paremelee, 2006) are descriptive in nature; they state the percentage of individuals who support or do not support euthanasia or suicide for each year of the GSS data. These previous studies find that as time passes the percentage of individuals who support both measures increases. While these findings are important at a descriptive level, they are not inferential. They do not determine if the effect of each period, for example, 2010 versus 1977, is statistically different from one another. Considering all previous research, only one study to date (Moulton et al., 2006) has attempted to statistically account for period effects. However, their treatment of survey year as an individual level variable disaggregated the hierarchically structured data (see Snijders & Bosker, 2012) and therefore biased the results of their analysis. Accordingly, this analysis improves our understanding of longitudinal changes in attitudes toward euthanasia and suicide for terminally ill persons by statistically accounting for period effects in the framework of hierarchical linear modeling. The findings of this analysis support the previously noted descriptive effects of time. Generally speaking, as time progresses, individuals are more likely to support euthanasia and suicide regardless of their birth-cohort membership or age at the time of survey.

Another important finding of this study is the effect of birth-cohort membership on attitudes toward euthanasia and suicide for terminally ill persons. Previous research (Duncan & Parmelee, 2006) finds significant birth-cohort effects, in which those belonging to younger cohorts have higher approval rates on both measures compared with those in older cohorts. The findings of this analysis partially support this previous research. Descriptively, there is much more between cohort variation in these attitudes during the earlier survey years compared with the later survey years (see Figure 2). However, the results of the APC models indicate much more fluctuation in attitudinal change for both measures attributable to age and period effects (see Figure 3). This effect is more pronounced in approval of euthanasia, where the probability of agreement based on birth cohort membership barely changes across cohorts. These findings indicate that while birth cohort membership is an important

determinant of attitudes toward euthanasia and suicide for terminally ill persons, age and period effects may play more of a contributing factor in the broad societal changes in these attitudes over time.

In addition to age, period, and cohort effects, this study also controlled for the effect of sex, race, education, political affiliation, and religious affiliation at the individual level. The purpose of this extension of the model was to examine if the significant APC effects remained after accounting for additional individual level factors found to be important by previous research. Overall, the addition of these control variables supported previous research. Consistent with previous findings, women were less likely to support euthanasia and suicide for terminally ill persons (DeCesare, 2000; Finlay, 1985), Black individuals and "other race" individuals were less likely to support (DeCesare, 2000; Jorgenson & Neubecker, 1980; Lichtenstein et al., 1997; Wasserman et al., 2006), democrats were more likely to support than other political parties (DeCesare, 2000), and Jewish individuals, those who reported belonging to an "other religion," and those who reported no religious affiliation were more likely to support both measures (Burdette et al., 2005; DeCesare, 2000). Previous research (Blackhall et al., 1999; Finlay, 1985) finds a negative relationship between education and these attitudes. However, these findings indicate a positive relationship in which those with higher education levels are more likely to support euthanasia and suicide.

It is important to note that while this research overall supports previous literature regarding demographic differences in these attitudes, it is not fully capable of explaining why these differences exist. It is likely that the demographic controls employed in this study are mere identifiers for individuals' lived experience which may explain the observed demographic group-based differences. For example, Sharp (2017a, 2017b) argues that variation in attitudes toward end of life issues exhibited across denominations are more likely to be a cause of the underlying differences in ideologies regarding the afterlife among various religions. It may also be the case that the observed sex differences are being driven by the lived experience of gender. Other death and dying literature has documented how gender roles shape attitudes and expectations about end of life issues (Hilario, 2015). Regarding political party affiliation, it is likely that democrats are more liberal in general than other political parties and therefore more likely to agree to both euthanasia and suicide.

The overarching goal of this study was to examine broad social changes in attitudes toward euthanasia and suicide for terminally ill persons from 1977 to 2016. Drawing on life course sociological theory, I examined micro and macro level social processes that affect changes in these attitudes over time. Given the important effects found in this study, how do attitudes toward euthanasia and suicide change? At the individual level, people are less likely to support euthanasia and suicide as they age. Although this analysis reveals this important trend, it does not explain why it occurs. One possible explanation is that younger

individuals are more naïve about the realities of euthanasia or suicide. These options surrounding the end of life may seem appealing or even heroic in early life stages, especially because most individuals during early adulthood do not encounter death and dying very frequently (DeSpelder & Strickland, 2015). However, as people age their awareness of death grows and mortality becomes more salient. Individuals in later adulthood may not support euthanasia or suicide because these issues hit much closer to home, and rather than ending what time is left, they may believe that life should be extended. Future research should seek to better explicate this possibility.

Beyond the individual level, this study finds that attitudes more drastically change with the passage of time compared with birth cohort membership. The progression of time brings about new medical technologies, advances in health social movements related to death with dignity, and changes in our society's health-care system. Accordingly, future research should continue to monitor broad changes in support for euthanasia and suicide for terminally ill persons. One particularly interesting issue will be if the U.S. population will experience rising, falling, or stabilizing of these attitudes. Given the rising approval of both euthanasia and suicide for terminally ill persons found in this study, it will also be interesting to monitor the future legalization of physician-assisted suicide. Because many states pass death with dignity laws through citizen voting, it may be the case that rising approval of both euthanasia and suicide will result in more laws allowing assisted suicide for terminally ill persons.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Note

1. To protect respondent identity, the GSS codes race as White, Black, and other race. Accordingly, the other race category refers to any individual who does not solely identify as White or Black.

References

Allen, J., Chavez, S., DeSimone, S., Howard, D., Johnson, K., LaPierre, L., . . . Sanders, J. (2006). Americans' attitudes toward euthanasia and physician-assisted suicide, 1936-2002. *Journal of Sociology & Social Welfare*, *33*(2), 5–23.

Alwin, D. F., & McCammon, R. J. (2003). Generations, cohorts, and social change. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 23–49). New York, NY: Plenum Publishers.

Bates, D., Maechler, M., Bolker, M., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48.

Baunach, D. M. (2011). Decomposing trends in attitudes toward gay marriage, 1988-2006. *Social Science Quarterly*, *92*(2), 346–363.

Baunach, D. M. (2012). Changing same-sex marriage attitudes in America from 1988 through 2010. *Public Opinion Quarterly*, *76*(2), 364–378.

Benson, J. M. (1999). Trends: End-of-life issues. *Public Opinion Quarterly*, *63*(2), 263–277.

Blackhall, L. J., Frank, G., Murphy, S. T., Michel, V., Palmer, J. M., & Azen, S. P. (1999). Ethnicity and attitudes towards life sustaining technology. *Social Science & Medicine*, *48*(12), 1779–1789.

Blendon, R. J., Benson, J. M., & Hero, J. O. (2014). Public trust in physicians- U.S. medicine in international perspective. *The New England Journal of Medicine*, *371*(17), 1570–1572.

Braveman, P., Egerter, S., & Williams, D. R. (2011). The social determinants of health: Coming of age. *Annual Review of Public Health*, *32*(1), 381–398.

Burdette, A. M., Hill, T. D., & Moulton, B. E. (2005). Religion and attitudes toward physician-assisted suicide and terminal palliative care. *Journal for the Scientific Study of Religion*, *44*(1), 79–93.

Bury, M. (1982). Chronic illness as biographical disruption. *Sociology of Health & Illness*, *4*(2), 167–182.

Costanza, D. P., Darrow, J. B., Yost, A. B., & Severt, J. B. (2017). A review of analytical methods used to study generational differences: Strengths and limitations. *Work, Aging and Retirement*, *3*(2), 149–165.

Curran, P. M. (1998). Regulating death: Oregon's death with dignity act and the legalization of physician-assisted suicide. *The Georgetown Law Journal*, *86*, 725–749.

DeCesare, M. A. (2000). Public attitudes toward euthanasia and suicide for terminally ill persons: 1977 and 1996. *Social Biology*, *47*(3/4), 264–276.

DeSpelder, L. A., & Strickland, A. L. (2015). *The last dance: Encountering death and dying*. New York, NY: McGraw Hill.

Donnelly, K., Twenge, J. M., Clark, M. A., Shaikh, S. K., Beiler-May, A., & Carter, N. T. (2016). Attitudes toward women's work and family roles in the United States, 1976-2013. *Psychology of Women Quarterly*, *40*(1), 41–54.

Duncan, O. D., & Paremelee, L. F. (2006). Trends in public approval of euthanasia and suicide in the US, 1947-2003. *Journal of Medical Ethics*, *32*(5), 266–272.

Elder, G. H. (1994). Time, human agency, and social change: Perspectives on the life course. *Social Psychology Quarterly*, *57*(1), 4–15.

Elder, G. H. (1998). The life course as developmental theory. *Child Development*, *69*(1), 1–12.

Finlay, B. (1985). Right to life vs the right to die- some correlates of euthanasia attitudes. *Sociology and Social Research*, *69*(4), 548–560.

Firebaugh, G. (1997). *Analyzing repeated surveys*. Thousand Oaks, CA: Sage.

Glenn, N. D. (2005). *Cohort analysis* (2nd ed.). Thousand Oaks, CA: Sage.

Hilario, A. P. (2015). Making sense of a changed physical body: Why gender matters at end of life. *Journal of Aging Studies*, *33*, 58–66.

Jorgenson, D., & Neubecker, R. (1980). Euthansia: A national survey of attides toward voluntary termination of life. *OMEGA—Journal of Death and Dying*, *11*(4), 281–291.

Lichtenstein, R. L., Alcser, K. H., Corning, A. D., Bachman, J. G., & Doukas, D. J. (1997). Black/white differences in attitudes toward physician-assisted suicide. *Journal of the National Medical Association*, *89*(2), 125–133.

Marengoni, A., Angleman, S., Melis, R., Magialasche, F., Karp, A., Garmen, A., . . . Fratiglioni, L. (2011). Aging with multimorbidity: A systematic review of the literature. *Ageing Research Reviews*, *10*(4), 430–439.

Mayer, K. U. (2009). New directions in life course research. *Annual Review of Sociology*, *35*, 413–433.

Moulton, B. E., Hill, T. D., & Burdette, A. (2006). Religion and trends in euthanasia attitudes among U.S. adults, 1977-2004. *Sociological Forum*, *21*(2), 249–272.

R Core Team. (2017). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Ryder, N. B. (1965). The cohort as a concept in the study of social change. *American Sociological Review*, *30*(6), 843–861.

Sharp, S. (2017a). Belief in life after death and attitudes toward voluntary euthanasia. *OMEGA: Journal of Death and Dying*. doi:10.1177/0030222817715755

Sharp, S. (2017b). Belief in miracles and attitudes toward volunatry euthanasia. *Death Studies*, *41*(4), 211–219.

Singh, B. K. (1979). Correlates of attitudes toward euthanasia. *Biodemography and Social Biology*, *26*(3), 247–254.

Snijders, T., & Bosker, R. J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling* (2nd ed.). Thousand Oaks, CA: Sage.

Starr, P. (1982). *The social transformation of American medicine*. New York, NY: Basic Books.

Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques*. Thousand Oaks, CA: Sage.

Wasserman, J., Clair, J. M., & Ritchey, F. J. (2006). Racial differences in attitdues toward euthansia. *OMEGA—Journal of Death and Dying*, *52*(3), 263–287.

Yang, Y. (2008). Social inequalities in happiness in the United States, 1972 to 2004: An age-period-cohort analysis. *American Sociological Review*, *73*(2), 204–226.

Yang, Y., & Land, K. C. (2006). A mixed models approach to the age-period-cohort analysis of repeated cross-section surveys, with an application to data on trends in verbal test scores. *Sociological Methodology*, *36*(1), 75–97.

Yang, Y., & Land, K. C. (2008). Age–period–cohort analysis of repeated cross-section surveys: Fixed or random effects? *Sociological Methods & Research*, *36*(3), 297–326.

Author Biography

Brandon K. Attell is a research associate at the Georgia Health Policy Center at Georgia State University. His research interests include mental health and stress, life course sociology, quantitative methods, and behavioral health.