Sociology Theses   Department of Sociology

12-16-2015

Social Change in Attitudes Toward Euthanasia and Suicide for Terminally Ill Persons, 1977-2014: An Age-Period-Cohort Analysis

Brandon Attell

Follow this and additional works at: https://scholarworks.gsu.edu/sociology_theses

Recommended Citation

Attell, Brandon, "Social Change in Attitudes Toward Euthanasia and Suicide for Terminally Ill Persons, 1977-2014: An Age-Period-Cohort Analysis." Thesis, Georgia State University, 2015.
doi: https://doi.org/10.57709/7617010

SOCIAL CHANGE IN ATTITUDES TOWARD EUTHANASIA AND SUICIDE FOR

TERMINALLY ILL PERSONS, 1977-2014: AN AGE-PERIOD-COHORT ANALYSIS

by

BRANDON KYLE ATTELL

Under the Direction of Ben Kail, PhD

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 recently developed cross-classified mixed effects logistic regression, I better account for this liberalization process by disentangling the age, period, and cohort effects that contribute to longitudinal changes in these attitudes. Findings indicate that while attitudes toward euthanasia and suicide have liberalized over time, they remained relatively stable over the past 10 years. Furthermore, this study finds significant age effects in which the probability of agreement to euthanasia and suicide steadily decreases throughout the life course. Contrary to previous research, this study finds that when controlling for age and period effects, there are no significant birth-cohort effects that contribute to longitudinal changes in these attitudes.

INDEX WORDS: Euthanasia, Physician-assisted suicide, Public opinion, Longitudinal research, General social survey, Hierarchical linear modeling

SOCIAL CHANGE IN ATTITUDES TOWARD EUTHANASIA AND SUICIDE FOR

TERMINALLY ILL PERSONS, 1977-2014: AN AGE-PERIOD-COHORT ANALYSIS

by

BRANDON KYLE ATTELL

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2015

SOCIAL CHANGE IN ATTITUDES TOWARD EUTHANASIA AND SUICIDE FOR

TERMINALLY ILL PERSONS, 1977-2014: AN AGE-PERIOD-COHORT ANALYSIS

by

BRANDON KYLE ATTELL

Committee Chair: Benjamin Lennox Kail

Committee: Erin Ruel

Wendy Simonds

Electronic Version Approved:

Office of Graduate Studies

College of Arts and Sciences

Georgia State University

December 2015

ACKNOWLEDGEMENTS

I would first like to thank Ben Kail for directing this project, spending time reviewing the various drafts that it went through, providing insightful feedback, and never letting me leave his office with my statistics questions unanswered. My gratitude is also extended to Erin Ruel and Wendy Simonds for their committee work on this project. Their thoughtful comments both guided and improved my thesis considerably. I would also like to thank Elisabeth Burgess of the Gerontology Institute at GSU for thoughtful conversations and feedback on a much earlier version of this project.

I am deeply indebted to the friends I have made in graduate school for the social support they have provided during this time of professional socialization. In no particular order, Leah Kozee Youngblood, Eryn Grucza-Viscarra, and Ana LaBoy have been the sisters that I never had growing up. To all three of you, thank you for: burritos, beer, karaoke, dancing, laughing, cupcakes, car rides, and Eryn's 30th birthday party. I would also like to thank Jacob Allen for the encouragement and motivation he has offered to me in graduate school, and for always listening at length when I wanted to talk sociology or statistics.

To Linda Treiber, thank you for inspiring me to be a sociologist and for your continued support and faith in me. To Gail Markle, thank you for inspiring me to be a better writer and showing me the perseverance it takes to be a good academic.

Finally, thank you Mom, Dad, Robert, and Dave for loving me no matter what.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

On October 27, 1997 the state of 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 regards to the legislation, termed the Death with Dignity Act, attitudes mattered. The legislation barely passed voter approval with a rate of 51 percent (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 percent. 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.

Five states 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. The majority of 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 four states have approved physician assisted suicide; and for which groups do attitudes change the most.

Using cumulative data from the 1977-2014 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 10 years of survey data to the existing longitudinal trend research on this topic. Second, using age-period-cohort analysis I more accurately decompose social change in these attitudes over time. Third, I determine if previously found cross-sectional demographic determinants of attitudes toward euthanasia and suicide such as gender, race, education, or political affiliation, remain significant in the longitudinal context.

2   LITERATURE REVIEW

2.1   Changing Attitudes in America

Attitudes of the American public have significantly liberalized over time on a variety of social phenomena. Homosexuality[1], once widely considered to be deviant and immoral, has become more socially accepted since the early 1990s (Loftus 2001). For instance, the tolerance and equality framing of the gay rights movement led to a sea change in public attitudes toward same-sex marriage; whereas 71 percent of the U.S. population disapproved of same-sex marriage in 1986, only 56 percent disapproved in 2006 (Baunach 2011), and by 2010 only 40% disapproved[2] (Baunach 2012). Furthermore, from the early 1970s onward, Americans became more supportive of free speech and first amendment rights (Davis 2012; Davis 1975), moved away from discriminatory attitudes regarding racial inequality (Bobo et al. 2012; Firebaugh and Davis 1988), and increasingly favored women's equality across a variety of measures (Bolzendahl and Myers 2004; Campbell and Marsden 2012). A recent Gallup analysis of American's moral attitudes from 2001 to 2014 reports record high approval rates regarding the morality of birth control, divorce, and sex between unmarried men and women (Riffkin 2014). Clearly, there are many domains in which American's attitudes have become more liberal over time.

Similarly, this liberalization process is mirrored in rising approval rates toward euthanasia and suicide for terminally ill persons. Early research began by documenting cross-sectional demographic correlates; for instance, in 1977 the General Social Survey (GSS), a

---

[1] Many of the findings from previous research reported in this thesis derive from analyses of the General Social Survey. Data collected from the GSS involve the use of several problematic terms, among them the words "homosexuality", "male", and "female." These words have clinical and pathological connotations, and sociologists have pointed out their problematic usage. I use these words in this thesis to match the language used during data collection and subsequently how other scholars report findings in peer-reviewed work.

[2] Baunach (2011; 2012) uses separate decomposition techniques to model longitudinal changes in attitudes toward gay marriage. For comparative purposes, I collapsed the percentages of individuals who strongly disagree (24.5%) and disagree (15.4%) to gay marriage in the 2012 article to match percentages reported in the 2011 article.

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, B.K. Singh used the 1977 GSS data to publish the first empirical paper 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 (Singh 1979). 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 gender, race, educational attainment, political affiliation, and religious ideology. Compared to 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 nonwhites have toward the medical profession (DeCesare 2000; Jorgenson and Neubecker 1980; Lichtenstein et al. 1997; Wasserman, Clair and 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; Finaly 1985). This is likely because higher education reflects social class positions in which individuals have better access to medical care and treatment (Braveman, Egerter, and Williams

2011). Additionally, 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 ideology also has strong connections to the voluntary taking of life. Compared to 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 and 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, Gallup data 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). In regard to suicide for terminally ill persons, GSS data demonstrates 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 B.K. 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 (DeCesare 2000).

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 1977-2004. Although Moulton et al. 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" (2006:259). 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, Hill, and Burdette 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 and 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 and 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 to those in the older cohort.

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 2 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 non-normally distributed and non-linear. 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.

Additionally, almost all of the longitudinal research to date on this topic has not statistically accounted for change over time. The research 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 and 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[3], 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 (Hox 2010). Disaggregation of hierarchically structured data typically results in false positive tests of statistical significance (Hox 2010; Snijders and 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, and 2014. Thus, it is important to understand whether attitudes toward euthanasia and suicide for terminally ill persons changed since 2004, particularly in light of the passage of the 2008 Washington Death with Dignity Act and the 2009 ruling of the Montana Supreme Court that upheld compassionate care for the end of life. Moreover, this analysis will update our understanding of – in addition to religious ideology – whether the effects of other demographic correlates change over time (for example, by racial identity or political affiliation).

2.2 Temporal Variation: Life Course Theory

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

---

[3] Individual-level variables refer to characteristics of people that are modeled in multi-level frameworks. Typical individual-level variables include the age, race, and gender of a person. An indicator for which year a person completed a survey is not a "true" individual-level variable because survey years represent higher order social phenomenon.

interplay of human lives and historical times, the timing of lives, linked or interdependent lives, and human agency in choice making" (Elder 1994: 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 (Elder 1998). Three such assumptions are that social change: (a) occurs between and within cohorts; (b) takes place over an extended period of time; 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). For example, all individuals who marry in a given year or all women who give birth in a given year are both examples of cohorts. 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 (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 and 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 to individuals born during the post World-War II era, when the United States experienced an economic boom on many fronts.

For the purposes of this research, cohort attitudes are individual level characteristics that are stable across time within any given cohort. However, 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 (for example, see Blendon, Benson, and Hero 2014), compared to 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 cohort succession 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. This process is known as intracohort change (Firebaugh 1997). Age, or intracohort change, 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). As individuals age with chronic illnesses, strain will be placed on the already fragmented American health care system (Wiener and Tilly 2002). 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 to 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 refer to specific historical events that deeply impact an individual, for example experiencing the stock market

crash of 1929, the civil rights movement of the 1960s, or the terroristic attacks on the United States on September 11, 2001. Thus, period effects can be thought of as those historical events that impact all 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 completely ignored the role of period effects 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 (Dowbiggin 2003), were key in shaping public opinion towards 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.

2.3   Moderation of Cohort Effects

While cohorts hold a central place in shaping individual's attitudes and opinions, they cannot wholly account for attitudinal change over time. This is because within cohorts, individuals are born into stratifications across a variety of social domains, such as race, class, gender, and sexuality, which all shape the lived experience across the life course (Newman 2003), a process which Mannheim (1972) terms the *stratification of experience*. Therefore, the stratification of experience can be understood as a moderator of cohort effects. That is, attitudes

toward social phenomena depend on both an individual's existence within a cohort as well as their lived experience along the lines of stratified social domains within that cohort

2.4 Summary and Hypotheses

Synthesizing all of these viewpoints, the life course theoretical perspective frames my work on attitudinal changes toward euthanasia and suicide for terminally ill persons in several ways. The theoretical viewpoint posits that attitudinal change is tied to cohorts, perhaps through cohort succession (i.e. cohort effects), intracohort change (i.e. age effects), or period effects. Within a cohort, however, these attitudes may also be shaped by the specific location of an individual within various stratifications, such as race, class, gender, and sexuality.

Taking together the review of previous literature as well as the life-course theoretical perspective, I test the following hypotheses in this research. Based on the previous trend research noting the liberalization of attitudes over time (Allen 2006, Benson 1999, DeCesare 2000, Duncan and Parmelee 2006, Moulton, Hill, and Burdette 2006), hypothesis 1 states that public approval of euthanasia and suicide for terminally ill persons will continue to increase following the addition of the 2006-2014 GSS data.

Based on a life-course perspective (Firebaugh 1997, Ryder 1965), hypothesis two states that longitudinal changes in attitudes toward euthanasia and suicide for terminally ill persons are independently determined by age, period, and cohort effects.

Based on the life course perspective (Mannheim 1972) and previous research noting cross-sectional demographic differences in attitudes toward the voluntary taking of life (Blackhall 1999, Burdette, Hill, and Moulton 1999, DeCesare 2000, Finlay 1985, Jorgenson and Neubecker 1980, Lichtenstein et al. 1997, Wasserman, Clair and Ritchey 2006), hypotheses three-A through three-E states that the influence of cohort membership on longitudinal approval

of euthanasia and suicide for terminally ill persons is determined by the stratification of

experience. Specifically:

H3$_a$: Women will be less approving of these attitudes.

H3$_b$: Compared to whites, blacks and those reporting "other race" will be less

approving of these attitudes.

H3$_c$: As education increases, support for the voluntary taking of life decreases.

H3$_d$: Democrats will be more approving of these attitudes compared to

republicans.

H3$_e$: Compared to Protestants, Catholics, or Jewish individuals, those who report

no religious affiliation will have the greatest approval of suicide and euthanasia

for terminally ill persons.

3   METHODS

The data for this research comes from the cumulative 1977-2014 General Social Survey (GSS). The GSS monitors public opinion and social change through periodic surveys using a national probability sample of all English speaking non-institutionalized individuals 18 years of age and older living in the United States (Smith, Hout, and Marsden 2012). The GSS began as an annual survey of the U.S. public in 1972 and in 1994 switched to a biannual survey design. My analysis is restricted to only the years containing focal variables of interest, and therefore does not include the 1972-1976 annual survey years, and the 1980, 1984, and 1987 survey years. Pooling the available data for years 1977-2014 creates a dataset of 22 cross-sectional, nationally representative surveys (N=47,249 prior to listwise deletion), which are ideal for use in age-period-cohort analyses (Yang and Land 2013). I limited analysis to those individuals with non-missing values on all study variables (N=28,493)[4]. The GSS is the best data for this analysis because it is the longest running nationally representative survey of the American public.

3.1   Age-Period-Cohort Analysis

Age-period-cohort (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 2005:3). APC analysis was developed, therefore, to surpass the problems associated with cross-sectional

---

[4] See Appendix A for a discussion of missing data.

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. In regard to 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 and Land 2006).

The identification problem has plagued APC analyses for more than thirty years (for example, see Fienberg and Mason 1979; Glenn 2005; and Mason and Fienberg 1985). In the past, APC studies have treated period and cohort as fixed effects. Treating the period and cohort effects as fixed effects, however, runs the risk of violating the assumption of independence of errors term of ordinary least squared regression because the error term is likely correlated among members of the same cohort or among people observed during the same period, and assumes that the impact of level-1 covariates (e.g. age) are equivalent across higher order units (i.e. period and cohort). In other words, it is predicated on the assumption that the group level variances are equal and, that there is no between-group variance. In contrast, adding cohort and period random effects (i.e. variance components) means assuming that members of a particular cohort or period are in fact similar to each other (and so the assumption is that the error term of that parameter

will be correlated among members of the same cohort or period), but that there is random variation between groups. A mixed effects model, therefore, is a special case of a hierarchical model that simultaneously estimates fixed effects and random effects. This technique estimates the direct effects of periods and cohorts (as well as age) on attitudes toward euthanasia and suicide for terminally ill people through the fixed effects cohort and period parameters, but also accounts for any unmeasured period and cohort level heterogeneity through the random effects parameters (Rabe-Hesketh and Skrondal 2012; Raudenbush et al. 2011; Yang and Land 2008).

In my analysis, I use the APC methods outlined by Yang (2008) and Yang and Land (2006). Yang and Land circumvent the identification problem by estimating age, period, and cohort effects utilizing generalized linear mixed modeling (GLMM), specifically cross-classified mixed effects modeling. Cross-classified mixed effects modeling is a type of hierarchical linear modeling (HLM). 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. One of the classic examples of this kind of nesting structure involves students nested within middle schools and high schools. Some students will go from middle school A to high school Z, but some students from middle school A will go to high school W. However, in addition to receiving students from middle school A, some students who attend high school Z will have come from middle schools B and C, etc. In the case of the Age-Period-Cohort model, the cross-classified design addresses the issue that some members of cohort A will be alive during period/year Z, and some members of cohort A will be alive during period/year W. However, members of other cohorts (e.g. cohorts B and C) will also be alive during periods/years Z and W. (Raudenbush, et al. 2011; Yang and Land 2008).

3.2   Measures

3.2.1   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?" It is important to note that both of these questions aim to measure attitudes regarding the ending of life for medical reasons, specifically terminal illness. The former is a measure of voluntary active euthanasia while the latter is a measure of active suicide (Huxtable 2013). Both variables are coded as dichotomous indicators, where 0 represents a response of "no" and 1 represents a response of "yes".

3.2.2   APC Variables

Age-period-cohort 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. I use three variables, 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 10-year birth cohorts, which is determined by subtracting *age* from *year* for each participant.

3.2.3   *Moderation of Cohort Effects Variables*

In order to account for how the stratification of experience affects attitudes toward euthanasia and suicide for terminally ill persons, I identify several thematically interesting groups. *Female* is an indicator of the variable gender 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. I also trichotomize the GSS race variable to create three dummy coded indicators for *white race, black race*, and *other race. White race* is the reference category for the race indicators. I also include a measure of educational attainment, where *education* represents each year of formal schooling the respondent has completed. Four indicators represent political affiliation: *Democrat*, *Republican, Independent, and other party* with *Republican* as the reference category. Finally, I model religious affiliation with dummy coded indicators for *Protestant, Catholic, Jewish, other religion,* and *no religious affiliation.* For the religion indicators, *no religious affiliation* is the reference category. I selected all reference categories based on the previous research showing that these groups are most likely to support euthanasia and suicide for terminally ill persons.

3.2.4   *Control Variables*

I include 2 control measures as level-1 covariates in order to account for any potential spurious relationships. The first control measure, *children*, accounts for the number of children had by each respondent at the time of the survey. The second control measure accounts for marital status with the indicators *married, widowed*, *divorced*, *separated*, and *never married*. *Never married* is the reference category for the marital status control measure. Previous researchers failed to include these 2 control measures in their analyses. However, it is plausible that an individual's attitudes toward euthanasia and suicide may be a function of marital status or

the number of children they have. Marital partners or children may provide social support or a

sense of connectivity that make an individual less likely to support the ending of a life. For these

reasons, I control for the effect of marital status and children in my analysis.

3.3   Plan of Analysis

I begin my analysis with bivariate statistics for the relationships between age, period, and

cohort membership and support for euthanasia and suicide for terminally ill persons. Bivariate

statistics test for a significant relationship between two variables of interest (for example, age

and support for euthanasia), and are therefore an important starting point for subsequent

multivariate analyses that account for the relationship between more than two variables. I

specifically test the bivariate relationships between age, period, and cohort membership and

support for euthanasia and suicide for terminally ill persons using the chi-square test. The chi-

square test utilizes cell counts of tabular data between the two categorical variables of interest.

For the purposes of this chi-square analysis, I categorize age into 5-year age groups, period into

5-year period groups, and birth cohort into 10-year cohort groups. Because support for

euthanasia and suicide for terminally ill persons are dichotomous indicators, they do not need to

be recoded for this analysis. The chi-square test is specified as:

$$\chi^2 = \sum_{i=1}^{k} \frac{(f_o - f_e)^2}{f_e} \tag{1}$$

where f_o represents the observed cell frequencies in the bivariate table and f_e represents

expected cell frequencies in the bivariate table.

In addition to the chi-square test, I further examine the bivariate relationship between age

and support for euthanasia and suicide for terminally ill persons with an independent samples t-

test. The independent samples t-test examines if two separate groups significantly differ on

mean scores of a variable of interest. In this case, I test whether the mean age of those who support euthanasia or suicide differs from those who do not support. While the chi-square test requires a categorical grouping of age, the independent samples t-test utilizes the original linear form of age. The independent samples t-test is specified as:

$$t = \frac{\bar{Y}_1 - \bar{Y}_2}{\sqrt{\frac{S_{Y_1}^2}{N_1} + \frac{S_{Y_2}^2}{N_2}}} \tag{2}$$

where $\bar{Y}_1$ represents the average age of those who support, $\bar{Y}_2$ represents the average age of those who do not support, $S_{Y_1}^2$ represents the variance in age of those who support, $S_{Y_2}^2$ represents the variance in age of those who do not support, N_1 represents the number of individuals who support, and N_2 represents the number of people who do not support.

Following the procedures outlined by Yang (2008) and Yang and Land (2006), I estimate longitudinal changes in attitudes toward euthanasia and suicide for terminally ill persons using the following equations. Equation 3, which accounts for the level-1 individual age effects, is:

$$\log\frac{P_{ijk}}{(1 - P_{ijk})} = \alpha_{jk} + \beta_{1ijk}A + \beta_{2ijk}A^2 + \beta_{3ijk}F + \beta_{4ijk}B + \beta_{5ijk}O + \beta_{6ijk}E + \beta_{7ijk}D \tag{3}$$

$$+ \beta_{8ijk}I + \beta_{9ijk}OP + \beta_{10ijk}P + \beta_{11ijk}C + \beta_{12ijk}J + \beta_{13ijk}OR + \sum_{p=5}^{P}\beta_p X_p$$

$$+ e_{ijk}, e_{ijk} \sim N(0, \sigma^2)$$

for
    i=1, 2, …, 28,493 individuals nested within cohort j and period k;

    j=1, …, 11 birth cohorts;

    k=1, …, 22 survey years;

where P_{ijk} represents the probability of supporting euthanasia or suicide for terminally ill persons, α_{jk} represents the regression intercept, A represents age, A^2 represents age squared, F is

the indicator for being female, B is the indicator for being black, O is the indicator for being

"other race", E represents years of education, D is the indicator for being a Democrat, I is the

indicator for being Independent, OP is the indicator for being "other party", P is the indicator for

being Protestant, C is the indicator for being Catholic, and J is the indicator for being Jewish, and

OR is the indicator for belonging to an "other religion." β_p represents the vector of regression

coefficients for the control measures outlined above. The equation also accounts for the random

individual effect, e_{ijk}, which is assumed normally distributed with a mean of 0 and variance σ^2

(Yang and Land 2006).

Equations 4.1 through 4.12 represent the level-2 effects:

$$\alpha_{jk} = \pi_0 + t_{0j} + c_{0k} \tag{4.1}$$
$$\beta_{3ijk} = \pi_3 + c_{3k} + \sigma_{k3} \tag{4.2}$$
$$\beta_{4ijk} = \pi_4 + c_{4k} + \sigma_{k4} \tag{4.3}$$
$$\beta_{5ijk} = \pi_5 + c_{5k} + \sigma_{k5} \tag{4.4}$$
$$\beta_{6ijk} = \pi_6 + c_{6k} + \sigma_{k6} \tag{4.5}$$
$$\beta_{7ijk} = \pi_7 + c_{7k} + \sigma_{k7} \tag{4.6}$$
$$\beta_{8ijk} = \pi_8 + c_{8k} + \sigma_{k8} \tag{4.7}$$
$$\beta_{9ijk} = \pi_9 + c_{9k} + \sigma_{k9} \tag{4.8}$$
$$\beta_{10ijk} = \pi_{10} + c_{10k} + \sigma_{k10} \tag{4.9}$$
$$\beta_{11ijk} = \pi_{11} + c_{11k} + \sigma_{k11} \tag{4.10}$$
$$\beta_{12jk} = \pi_{12} + c_{12k} + \sigma_{k12} \tag{4.11}$$
$$\beta_{13ijk} = \pi_{13} + c_{13k} + \sigma_{k13} \tag{4.12}$$

Equation 4.1 specifies the period and cohort effects, where α_{jk} is the random intercept

accounting for the mean variation from period to period and cohort to cohort, π_0 is the grand

mean when all level 1 variables equal zero, t_{0j} is the random period effect, and c_{0k} is the random

cohort effect. Equations 4.2 thru 4.12 specify the cohort moderation effects of the level 1

variables, where π_3 ... π_{13} represent fixed effect coefficients for each of the level 1 demographic

variables, $c_{3k} \ldots c_{13k}$ represent the cohort variation for each of the level 1 demographic variables,

and $\sigma_{k3} \ldots \sigma_{k13}$ represent the random variance components (error variances) of the cohort effects.

Combining equations 3 thru 4.12 yields the fully specified cross-classified mixed effects

APC model:

$$\log\frac{P_{ijk}}{\left(1 - P_{ijk}\right)} = \pi_0 + \beta_{1ijk}A + \beta_{2ijk}A^2 + \sum_{p=11}^{P}\left[\pi_p X_p + c_{pk}X_p + \sigma_{kp}X_p\right] + \sum_{p=5}^{P}B_p X_p \tag{5}$$

$$+ t_{0j} + c_{0k} + e_{ijk}, e_{ijk}\sim N(0, \sigma^2)$$

for

$i=1, 2, \ldots, 28{,}493$ individuals nested within cohort j and period k;

$j=1, \ldots, 11$ birth cohorts;

$k=1, \ldots, 22$ survey years.

4   RESULTS

Summary statistics for all variables in the analysis are presented in Table 1. A majority of individuals support both euthanasia (67%) and suicide for terminally ill persons (56%) across all survey years. The average age of respondents was 45.55 years (S.D.=17.37 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=12.93 years, S.D.=3.12 years). Most individuals had at least 1 child (M=1.91, S.D.=1.76). Regarding marital status, 48% of individuals were married at the time of the survey, 22% were never married, 13% were divorced, 9% were widowed, and 4% were separated. Almost half (49%) of the individuals were Democrats, while 36% were Republicans, 14% were Independent, and 1% belonged to another political party. Over half of the individuals were Protestant (57%), while 25% were Catholic, 12% reported no religious preference, 2% were Jewish, and 4% reported belonging to another religion.

The 1977-2014 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 percent to 58 percent. From 1983 (66 percent support) to 1998 (71 percent support) there is a stable increase in support for euthanasia, despite several small decreases in support in the years 1985 (65 percent support) and 1993 (68 percent support). Beginning in the year 2000, support for euthanasia drops slightly to 68 percent, where it remains relatively stable (fluctuating between 67 to 69 percent) until the

Table 1. Summary Statistics For All Variables in the Analysis

	Description and Coding	Mean or Proportion	SD	Min	Max
Dependent Variables					
Euthanasia	Support euthanasia for terminally ill person: 1=yes 0=no	0.67		0	1
Suicide	Support suicide for terminally ill person 1=yes 0=no	0.56		0	1
Level-1 Variables					
Age	Respondent's age at survey year	45.55	17.37	18	89
Female	Respondent's sex: 1=female; 0=male	0.56		0	1
Black	Respondent's race: 1= black; 0=white or other race	0.14		0	1
Other Race	Respondent's race: 1=other race; 0=white or black	0.05		0	1
Education	Respondent's level of schooling in years	12.93	3.12	0	20
Children	Respondent's number of children at time of survey	1.91	1.76	0	8
Divorced	Marital status: 1=divorced; 0= otherwise	0.13		0	1
Widowed	Marital status: 1=widowed; 0=otherwise	0.09		0	1
Separated	Marital status: 1=separated; 0=otherwise	0.04		0	1
Never Married	Marital status: 1=never married; 0=otherwise	0.22		0	1
Democrat	Political affiliation: 1=democrat; 0=otherwise	0.49		0	1
Independent	Political affiliation: 1=independent; 0=otherwise	0.14		0	1
Other Party	Political affiliation: 1=other party; 0=otherwise	0.01		0	1
Protestant	Religious affiliation: 1=protestant; 0=otherwise	0.57		0	1
Catholic	Religious affiliation: 1=catholic; 0=otherwise	0.25		0	1
Jewish	Religious affiliation: 1=jewish; 0=otherwise	0.02		0	1
Other Religion	Religious affiliation: 1=other religion; 0=otherwise	0.04		0	1

Level- 2 Variables		N	Min	Max
Period	Survey year	22	1977	2014
Cohort	10-year birth cohort	11	1888	1996

N=28,493. Cumulative General Social Survey

year 2014. Overall, for the past 37 years, support for euthanasia for terminally ill persons has increased by 7 percentage points, from 62 percent in 1977 to 69 percent in 2014.

From 1977 to 1982, support for suicide increases from 39 percent to 43 percent. From 1983 (50 percent support) to 1998, (65 percent support) there is a stable increase in support for suicide, despite several small decreases in support in the years 1985 (46 percent support), 1989 (50 percent support), and 1993 (60 percent support). Support for suicide for terminally ill persons drops between the years 1998 (65 percent support) and 2000 (58 percent support). However, beginning in the year 2002, support for suicide remains
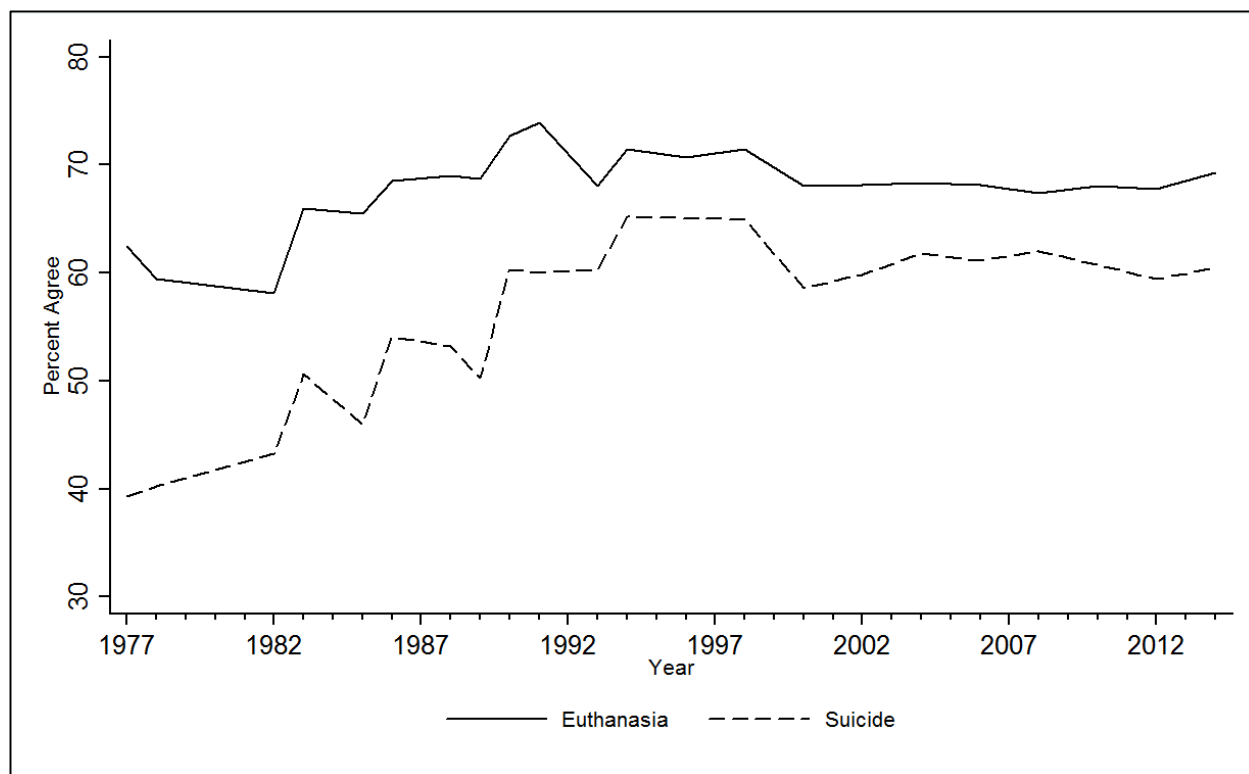
Figure 1. Support for Euthanasia and Suicide Over Time

relatively stable, fluctuating between 59 to 62 percent. Overall, for the past 37 years support for

suicide for terminally ill persons has increased by 21 percentage points, from 39 percent in 1977

to 60 percent in 2014.

Bivariate statistics for the relationship between age, period, and cohort membership and

support for euthanasia and suicide for terminally ill persons are displayed in Table 2. As age

increases the percentage of individuals supporting euthanasia ($\chi^2(14)$=351.26, $p\leq$.001) and

suicide ($\chi^2(14)$=590.06, $p\leq$.001) generally decreases. One exception to this trend is the peak in

support for suicide among the 28-32 year old age group, after which support for suicide

continues to decrease. The results of the independent samples t-test indicate that those who

support euthanasia for terminally ill persons (mean age=44.23 years, SD=16.96 years) are on

Table 2. Support for Euthanasia and Suicide by Age, Period, and Cohort Membership

Age	Euthanasia	Suicide	Period	Euthanasia	Suicide	Cohort	Euthanasia	Suicide
18-22	73.23	59.10	1977-1981	60.92	39.76	1888-1897	41.86	18.60
23-27	73.25	61.96	1982-1986	64.24	48.21	1898-1907	51.99	30.22
28-32	73.62	63.44	1987-1991	71.09	55.90	1908-1917	58.33	36.45
33-37	70.93	61.40	1992-1996	70.46	64.12	1918-1927	58.07	41.55
38-42	69.09	58.79	1997-2001	69.75	61.75	1928-1937	60.53	45.60
43-47	67.94	59.88	2002-2006	68.21	60.99	1938-1947	66.62	55.59
48-52	65.92	58.05	2007-2011	67.86	61.14	1948-1957	71.11	61.89
53-57	65.66	55.07	2012-2014	68.62	60.02	1958-1967	73.70	65.24
58-62	62.45	48.14				1968-1977	72.45	64.49
63-67	62.85	48.59				1978-1987	70.10	61.90
68-72	59.50	41.87				1988-1996	72.42	55.67
73-77	58.37	42.79						
78-82	57.86	42.01						
83-87	54.03	39.81						
88-89	57.84	41.62						
Total	67.59	56.11		67.59	56.11		67.49	56.11
χ^2	351.26***	590.06***		133.61***	687.76***		493.24***	.00012***
Df	14	14		7	7		10	10

N=28,493. Cumulative General Social Survey. Percentages appear in table cells. ***$p\leq.001$

average 4 years younger than those who do not support (mean age=48.31 years, SD=17.88 years), t (28,491)=18.68, $p\leq.001$. Similarly, those who support suicide for terminally ill persons (mean age=43.52 years, SD=16.45 years) are on average 5 years younger than those who do not support (mean age=48.15, SD=18.15 years), t (28,491)= 22.53, $p\leq.001$.

Regarding the period effects, support for euthanasia ($\chi^2(7)$=133.61, $p\leq.001$) and suicide ($\chi^2(7)$=687.76, $p\leq.001$) increases from 1977 to 1996, decreases slightly beginning in 1997, and remains relatively stable throughout the remainder of the survey years. Despite these small fluctuations, there is an overall liberalization of support for both measures. From 1977 to 2014, support for euthanasia increases by almost 8 percent while support for suicide for terminally ill persons increases by 20 percent. Finally, there is an inverse relationship between cohort membership and support for euthanasia ($\chi^2(14)$=351.26, $p\leq.001$) and suicide ($\chi^2(14)$=351.26, $p\leq.001$), in which the oldest birth cohorts have the lowest percentages of support. This relationship is most pronounced for the birth cohort differences in support for

suicide, where there is a 37-percentage point difference in support between those in the oldest and youngest birth cohort. For support for euthanasia, there is a 30-percentage point difference between the oldest and youngest birth cohort. While these bivariate findings point towards significant age, period, and cohort effects, it remains unclear whether each of these stand-alone effects remains significant after accounting for the other temporal parameters.

Accordingly, APC models were estimated to assess the conjoined influence of age, period, and cohort in a multivariable framework. The odds ratio estimates for the cross-classified mixed effects model of support for euthanasia for terminally ill persons are displayed in Table 3. Model 1 estimates a bivariate linear and quadratic relationship between age and support for euthanasia. While there is no significant quadratic relationship in this bivariate model, there is a significant negative linear effect; for every one year increase in age the odds of supporting euthanasia for terminally ill persons decreases by 2 percent (odds=0.98, $p \leq .001$). Model 2 estimates individual level age effects as well as period effects modeled on the individual level intercept. The linear age effect in model 1 remains significant in model 2 (odds=0.98, $p \leq .001$). Beginning in 1983, the period effects in model 2 show a small but stable increase in support for euthanasia over time. For example, those interviewed in 1983 are 13 percent more likely to support euthanasia (odds=1.13, $p \leq .05$) compared those interviewed in 1977. By the year 1993, individuals are 27 percent more likely to support (odds=1.27, $p \leq .001$), by the year 2004 individuals are 32 percent more likely to support (odds=1.32, $p \leq .05$), and by the year 2014 individuals are 45 percent more likely to support (odds=1.45, $p \leq .001$).

Model 3 estimates individual level age effects as well as cohort effects, also modeled on the individual level intercept. At the individual level there are significant linear (odds=0.98,

Table 3. Cross-Classified Mixed Effects Logistic Regression of Support for Euthanasia

	Model 1	Model 2	Model 3	Model 4
Intercept	3.96***	3.28***	1.70	3.10**
Age	0.98***	0.98***	0.98***	0.97***
Age^2	1.00	1.00	1.00*	1.00*
Period Effects[a]				
1978		0.86		0.86
1982		0.81		0.82*
1983		1.13*		1.13
1985		1.13		1.14
1986		1.29		1.30**
1988		1.30**		1.32*
1989		1.29**		1.31*
1990		1.58*		1.61***
1991		1.69***		1.72***
1993		1.27***		1.30*
1994		1.50*		1.54***
1996		1.41***		1.46**
1998		1.49***		1.54**
2000		1.28***		1.33*
2002		1.31**		1.38*
2004		1.32*		1.40*
2006		1.33**		1.42*
2008		1.28*		1.37
2010		1.35**		1.46*
2012		1.34**		1.46*
2014		1.45***		1.59*
Cohort Effects[b]				
1898-1907			1.38	1.25
1908-1917			1.68	1.39
1918-1927			1.61	1.22
1928-1937			1.72	1.20
1938-1947			2.12*	1.36
1948-1957			2.44**	1.44
1958-1967			2.55**	1.38
1968-1977			2.28*	1.14
1978-1987			2.03*	0.94
1988-1996			2.14*	0.92

N=28,493. Cumulative General Social Survey. Odds ratios appear in table cells.
*$p \leq$.05, **$p \leq$.01, ***$p \leq$.001; a: reference=1977; b: reference=1888-1897

$p \leq$.001) and quadratic (odds=1.00, $p \leq$.05) age effects. Beginning with the 1938 to 1947 birth

cohort, there are strong positive increases in support for euthanasia, with individuals born into

newer birth cohorts more likely to support euthanasia. This cohort effect is greatest for those

born between 1958 and 1967, who are 2.55 times more likely to support euthanasia compared to those born between 1888 and 1897 (odds=2.55, $p \leq .001$).

Model 4 estimates the full APC model of support for euthanasia for terminally ill persons. While model 2 accounts for period-to-period variation and model 3 accounts for cohort-to-cohort variation in support for euthanasia, model 4 simultaneously accounts for both of these level-2 effects while also controlling for the level-1 age effects. In the full APC model, there are significant linear (odds=0.97, $p \leq .001$) and quadratic (odds=1.00, $p \leq .05$) age effects. The period effects in model 4 indicate that controlling for the age and cohort effects, there is a small but significant curvilinear relationship in the odds of supporting euthanasia over time. Beginning in 1983, the odds of support steadily increases, peaking in the year 1991 (odds=1.72, $p \leq .001$). From 1993 onward, the odds of support remain greater compared to the year 1977 but exhibit several small fluctuations, namely in the years 1994 (odds=1.54, $p \leq .01$) and 2000 (odds=1.33, $p \leq .05$). By 2014, the odds of supporting euthanasia are 59 percent more likely than in 1977 (odds=1.59, $p \leq .05$).

The estimates of model 4 also indicate that controlling for the age and period effects, there are no significant cohort effects that contribute to attitudes toward euthanasia for terminally ill persons. Therefore, when simultaneously estimating the effect of age, period, and cohort membership on attitudes toward euthanasia, the statistically significant cohort effects observed in model 3 (in which period effects are not controlled for) no longer remain significant. Because the cohort parameters in the full APC model are not significant, model 2 (which accounts for age and period effects) is retained as the best model predicting attitudes toward euthanasia. The predicted probabilities of support for euthanasia by age and period from model 2, discussed above, are graphically displayed in figures 2 and 3.
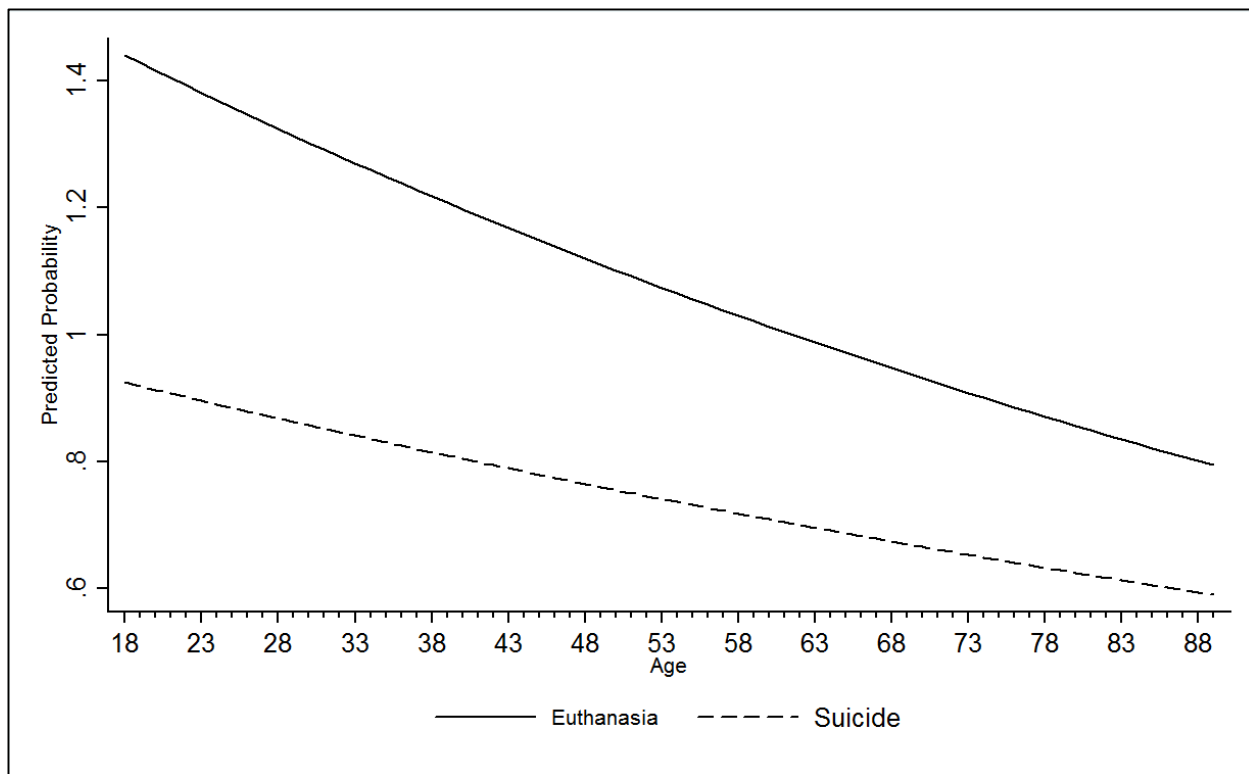
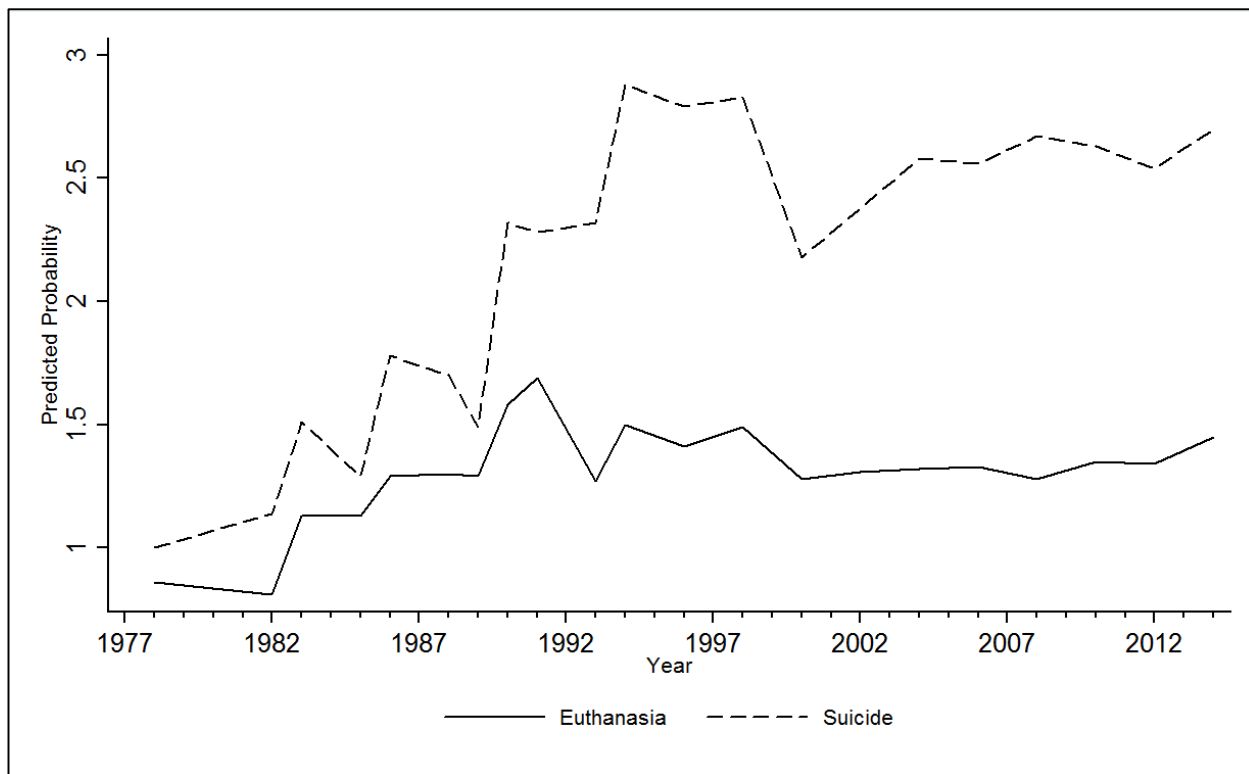**Figure 2. Predicted Probability of Support for Euthanasia and Suicide by Age**

Figure 3. Predicted Probability of Support for Euthanasia and Suicide by Period

The odds ratio estimates for the cross-classified mixed effects model of support for suicide for terminally ill persons are displayed in Table 4. Model 1 estimates a bivariate linear and quadratic relationship between age and support for suicide. While there is no significant quadratic relationship in this bivariate model, there is a significant negative linear effect; for every one year increase in age the odds of supporting suicide for terminally ill persons decreases by 1 percent (odds=0.99, $p \leq .001$). Model 2 estimates individual level age effects as well as period effects. The negative linear age effect in model 1 remains significant in model 2 (odds=0.99, $p \leq .001$). Beginning in 1983, the period effects in model 2 show a general increase in the odds of supporting suicide over time. Model 3 estimates individual level age effects as well as cohort effects. Beginning with the 1918 to 1927 birth cohort, there are strong positive increases in support for suicide, with individuals born into newer birth cohorts more likely to support euthanasia. This cohort effect is greatest for those born between the years 1958 and 1967, who are 4.09 times more likely to support suicide for terminally ill persons compared to those born between 1888 and 1897 (odds=4.09, $p \leq .01$).

Model 4 estimates the full APC model of support for suicide for terminally ill persons. In the full APC model, there is a significant negative linear age effect (odds=0.97, $p \leq .001$). Net of the effect of period and cohort, for every one year increase in age, the odds of supporting suicide decrease by 3 percent. The period effects in model 4 indicate that controlling for the effects of age and cohort, there is a steady increase in the odds of supporting suicide over time. Beginning in 1983, the odds of support increases, peaking in the year 1994 (odds=1.72, $p \leq .001$). From 1994 onward, the odds of support remain greater compared to the year 1977 but exhibit several small fluctuations, namely in the year 2000 (odds=2.25, $p \leq .001$). By 2014, the odds of supporting suicide are 190 percent more likely than in 1977 (odds=2.90, $p \leq .001$).

Table 4. Cross-Classified Mixed Effects Logistic Regression of Support for Suicide

	Model 1	Model 2	Model 3	Model 4
Intercept	1.91***	1.08	0.54	0.83
Age	0.99*	0.99**	0.99	0.98**
Age^2	1.00	1.00	1.00	1.00
Period Effects[a]				
1978		1.00		1.00
1982		1.14		1.14
1983		1.51***		1.52***
1985		1.29**		1.30**
1986		1.78***		1.80***
1988		1.70***		1.72***
1989		1.49***		1.51***
1990		2.32***		2.36***
1991		2.28***		2.33***
1993		2.32***		2.38***
1994		2.88***		2.95***
1996		2.79***		2.87***
1998		2.83***		2.91***
2000		2.18***		2.25***
2002		2.38***		2.47***
2004		2.58***		2.69***
2006		2.56***		2.69***
2008		2.67***		2.82***
2010		2.63***		2.79***
2012		2.54***		2.72***
2014		2.70***		2.90***
Cohort Effects[b]				
1898-1907			1.62	1.45
1908-1917			1.83	1.46
1918-1927			2.11*	1.51
1928-1937			2.32*	1.48
1938-1947			3.26**	1.85
1948-1957			4.02**	2.04
1958-1967			4.09**	1.86
1968-1977			3.53**	1.43
1978-1987			3.20**	1.16
1988-1996			2.42	0.80

N=28,493. Cumulative General Social Survey. Odds ratios appear in table cells.
*p≤.05, **p≤.01, ***p≤.001; a: reference=1977; b: reference=1888-1897

The estimates of model 4 also indicate that controlling for the effects of age and period, there are no significant cohort effects that contribute to attitudes toward suicide for terminally ill persons. Just as with the full APC model for support for euthanasia, when simultaneously estimating the effect of age, period, and cohort membership on attitudes toward suicide, the statistically significant cohort effects observed in model 3 (in which period effects are not

controlled for) no longer remain significant. Because the cohort parameters in the full APC

model are not significant, model 2 (which accounts for age and period effects) is retained as the

best model predicting attitudes toward suicide for terminally ill persons. The predicted

probabilities of support for suicide by age and period from model 2, discussed above, are

graphically displayed in figures 2 and 3.

The odds ratio estimates for the period effects with level-1 covariates are displayed in

table 5. While both of the 2nd models in tables 3 and 4 are retained as the best predicting APC

models of attitudes toward euthanasia and suicide for terminally ill persons, it is important to

include level-1 covariates to control for any potentially spurious relationships at the individual

level. Therefore, in addition to level-1 age effects and level-2 period effects, these models

account for gender, race, educational attainment, number of children, marital status, political

party affiliation, and religious ideology at the individual level. The results indicate that

compared to men, women are 27 percent less likely (odds=0.73, $p \leq .001$) to support euthanasia

and 23 percent less likely (odds=0.77, $p \leq .001$) to support suicide. Compared to white

individuals, black individuals are 64 percent less likely (odds=0.36, $p \leq .001$) to support

euthanasia and 59 percent less likely (odds=0.41, $p \leq .001$) to support suicide. Compared to white

individuals, those individuals who report being "other race" are 29 percent less likely

(odds=0.71, $p \leq .001$) to support euthanasia and 38 percent less likely (odds=0.62, $p \leq .001$) to

support euthanasia.

Regarding education, for every one year increase in years of school completed, the odds

of supporting euthanasia increase by 4 percent (odds=1.04, $p \leq .001$) and the odds of supporting

suicide increase by 9 percent (odds=1.09, $p \leq .001$). There is a negative relationship between

number of children and support for euthanasia and suicide. For every child had by the

Table 5. Level-2 Period Effects with Level-1 Covariates

	Euthanasia	Suicide
Intercept	5.23***	0.97
Age	0.98**	1.00
Age²	1.00	1.00
Female[a]	0.73***	0.77***
Black[b]	0.36***	0.41***
Other Race[b]	0.71***	0.62***
Education	1.04***	1.09***
Children	0.91***	0.91***
Divorced[c]	1.37***	1.37***
Widowed[c]	1.09	1.06
Separated[c]	1.34***	1.26***
Never Married[c]	0.96	1.11**
Democrat[d]	1.43***	1.31***
Independent[d]	1.11*	1.10*
Other Party[d]	1.04	1.55***
Protestant[e]	0.41***	0.30***
Catholic[e]	0.40***	0.30***
Jewish[e]	0.86	1.09
Other Relig.[e]	0.46***	0.34***
Period Effects[f]		
1978	0.86	0.99
1982	0.93	1.27**
1983	1.10	1.45***
1985	1.11	1.20*
1986	1.32**	1.79***
1988	1.30*	1.62***
1989	1.27*	1.41**
1990	1.54***	2.16***
1991	1.73***	2.25***
1993	1.22*	2.15***
1994	1.45***	2.66***
1996	1.34**	2.50***
1998	1.38***	2.47***
2000	1.21*	1.89***
2002	1.26*	2.09***
2004	1.18	2.11***
2006	1.25*	2.21***
2008	1.12	2.15***
2010	1.25*	2.18***
2012	1.16	1.95***
2014	1.27*	2.06***

N=28,493. Cumulative General Social Survey. Odds ratios appear in table cells. *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$
a: reference= men; b: reference= white; c: reference= married; d: reference=republican; e: reference= no religious affiliation; f: reference= 1977

Participant at the time of the interview, the odds of supporting both euthanasia and suicide

decrease by 9 percent (odds=0.91, $p \leq .001$). Compared to married individuals, those who are

divorced are 37 percent more likely (odds=1.37, $p \leq .007$) to support both euthanasia and suicide.

Similarly, compared to married individuals those who are separated are 34 percent more likely

(odds=1.34, $p \leq .001$) to support euthanasia and 26 percent more likely (odds=1.26, $p \leq .001$) to

support suicide. Additionally, those who have never married are 11 percent more likely

(odds=1.11, $p \leq .01$) to support suicide compared to those who are married.

Compared to Republicans, Democrats are 43 percent more likely (odds=1.43, $p \leq .001$) to

support euthanasia and 31 percent more likely (odds=1.31, $p \leq .001$) to support suicide.

Compared to Republicans, those individuals in the independent party are 11 percent more likely

(odds=1.11, $p \leq .05$) to support euthanasia and 10 percent more likely (odds=1.10, $p \leq .05$) to

support suicide. Regarding religious ideology, compared to individuals who report no religious

affiliation, Protestants are 59 percent less likely (odds=0.41, $p \leq .001$) to support euthanasia and

70 percent less likely (odds=0.30, $p \leq .001$) to support suicide. Similarly, compared to individuals

who report no religious affiliation, Catholics are 60 percent less likely (odds=0.40, $p \leq .001$) to

support euthanasia and 70 percent less likely to support suicide (odds=0.30, $p \leq .001$). Finally,

compared to individuals who report no religious affiliation, those who report belonging to some

other religion are 54 percent less likely to support euthanasia (odds=0.46, $p \leq .001$) and 66 percent

less likely to support suicide (odds=0.34, $p \leq .001$).

The addition of these level-1 covariates has marginal effects on the level-2 period

parameters from model 2 in tables 3 and 4. For visual purposes, the level-2 period parameters

with and without level-1 covariates are displayed in figure 4. Only 4 of the 17 significant period

parameters for support for euthanasia (model 2, table 3) become statistically insignificant with

the addition of the level-1 covariates in table 5 (years 1983, 2004, 2008, and 2012). All 19 of the
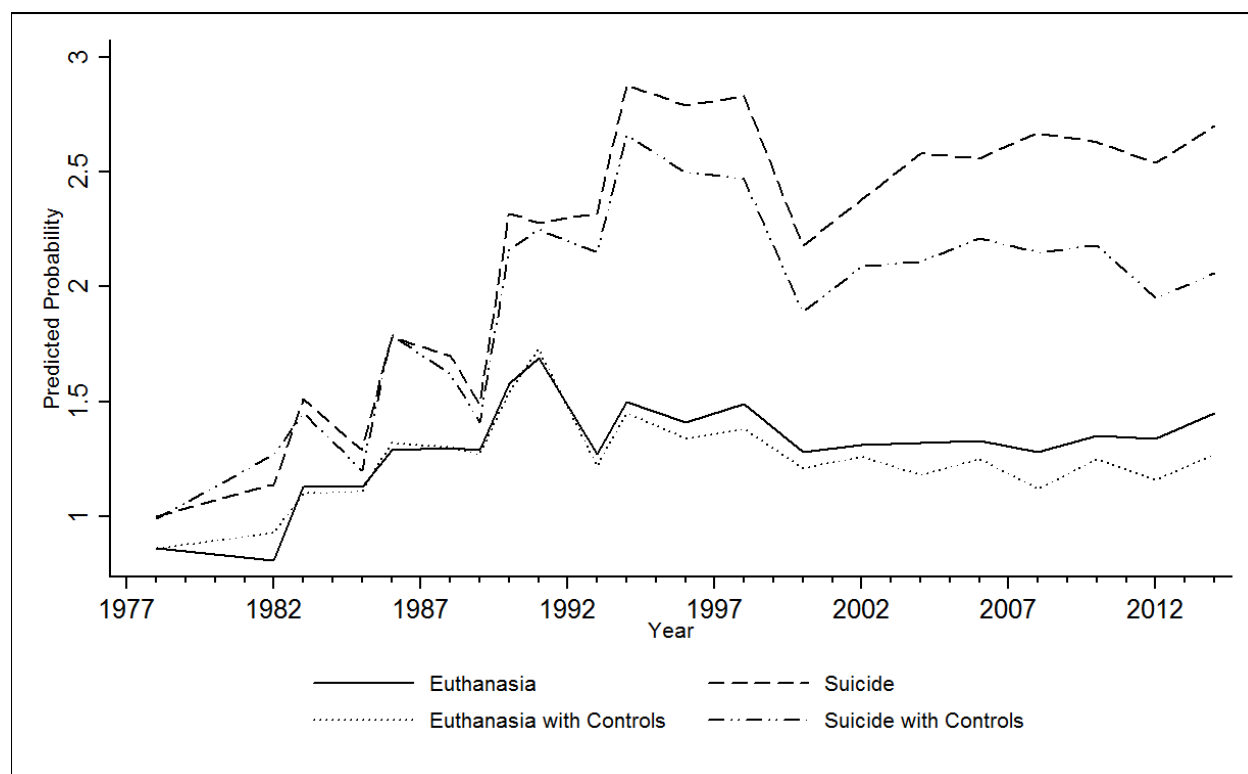
Figure 4. Level-2 Period Parameters With and Without Level-1 Covariates

significant period parameters for support for suicide (model 2, table 4) remain statistically

significant with the addition of the level-1 covariates in table 5. Controlling for the level-1

demographic covariates does slightly weaken the level-2 period parameters. Specifically, from

1994 to 2014, the period parameters that control for the level-1 demographic measures (table 5)

are weaker than the period parameters that do not take demographic measures into account

(model 2, tables 3 and 4). While the strength of the relationship between period and attitudes

toward euthanasia and suicide diminish with the addition of the level-1 covariates, the overall

direction of the relationship remains the same. These results indicate that when controlling for

demographic characteristics, the role that period effects play in shaping attitudes toward

euthanasia and suicide for terminally ill persons becomes slightly less powerful, although still

statistically significant.

The addition of level-1 covariates does not change the odds ratio for age predicting support for euthanasia (odds=0.98, $p \leq .01$ in model 2, table 3 and table 5). However, the addition of the level-1 covariates does diminish the significance and reverse the direction of the age parameter for support for suicide. In model 2, table 4, which accounts for only age and period effects, there is a significant negative relationship between age and support for suicide, in which for every one year increase in age the odds of supporting suicide decrease by 1 percent (odds=0.99, $p \leq .01$). However, when estimating age and period effects alongside the level-1 covariates, the relationship between age and support for suicide is non-significant and equal to 1. Therefore, when accounting for demographic characteristics at the individual level and period effects at level-2, age neither increases nor decreases the probability of supporting suicide for terminally ill persons.

One important follow up to the addition of the level-1 control variables in the multilevel framework is the test of the moderation of cohort effects. However, because the cohort parameters in the full APC model were found to be non-significant, the cohort moderation terms were not added to the parameters estimated in table 5. This decision was made because any non-significant cohort parameters in the full APC model would carry over in the estimation of cohort moderation effects. Accordingly, I found no evidence of cohort moderation as originally anticipated.

5   DISCUSSION

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 General Social Survey 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 ill persons generally increases from the 1970s onward (Allen 2006; Benson 1999; DeCesare 2000; Duncan and Parmelee 2006; Moulton, Hill, and Burdette 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? Hypotheses 1 of this study stated that approval of attitudes toward euthanasia and suicide for terminally ill persons will continue to increase following the addition of the 2006-2014 GSS data. The results of my analysis partially support hypothesis 1. Regarding euthanasia, 68 percent of individuals approve in 2004 and 69 percent of individuals approve in 2014, an increase in approval of just 1 percent for the past decade. Regarding suicide, 61 percent of individuals approve in 2004 and 60 percent of individuals approve in 2014, a decrease in approval of 1 percent for the past decade. Accordingly, while attitudes toward euthanasia and suicide have not liberalized over the past 10 years, they have remained stable.

In addition to the stability of attitudes toward euthanasia and suicide over the past 10 years, there are 2 other important conclusions to be made about changes among these attitudes from 1977 to 2014. 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 2014, the magnitude of the change in attitudes toward suicide is greater than that of the change in attitudes toward euthanasia. From 1977 to 2014, approval of suicide for terminally ill persons increases by 21 percentage points while approval of euthanasia increases by only 7 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).

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.   Specifically, hypothesis two of this study stated that longitudinal changes in these attitudes are independently determined by age, period, and cohort effects. The findings of my analysis partially support hypothesis 2, as discussed below.

The effect of age on attitudes toward euthanasia and suicide for terminally ill persons can be statistically summarized as a consistent negative relationship. At the bivariate level, considering a direct relationship between age and support for euthanasia and suicide, as individuals age their support for both measures generally decreases. Similarly, my analysis indicates that those who support euthanasia for terminally ill persons are on average 4 years younger than those who do not support, and those who support suicide for terminally ill persons are on average 5 years younger than those who do not support. While these bivariate relationships are an important starting point for examining changes in attitudes toward euthanasia and suicide, they do not take into account the influence of period and cohort membership on these attitudes. To address this issue, I utilized cross-classified mixed effects logistic regression to test a series of nested models that simultaneously estimated the effect of age, period, and cohort membership on these attitudes. Consistent with the bivariate findings, across all stages of the APC model there remains a negative relationship between age and support. 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 as a result of passing time is considerably limited. The majority of findings (Allen et al. 2006; Benson 1999; DeCesare 2000; Duncan and 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 Hox 2010 and Snijders and Bosker 2012), and therefore biased the results of their analysis. Accordingly, my 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 my 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.

Perhaps the most 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 and Parmelee 2006) finds significant birth-cohort effects, in which those belonging to younger cohorts have higher approval rates on both measures compared to those in older cohorts. The findings of my analysis do not support these previously found birth-cohort effects. The discrepancy in these findings arises because previous research failed to control for the effect of age and period when estimating the relationship between birth-cohorts and these attitudes. Indeed, at the bivariate level, I too found statistically significant relationships between cohort membership and approval of both euthanasia and suicide. The bivariate findings indicate that those belonging to younger birth-cohorts have higher level of approval compared to those in older birth cohorts. These cohort effects remain statistically significant when controlling for the

effect of age. However, once age, period, and cohort effects are estimated together in the full APC model, all previously significant cohort effects no longer remain and the direction of the relationship between cohort membership and support for euthanasia or suicide reverses from positive to negative for the 2 youngest birth cohorts.

The cohort effects found by previous research (Duncan and Parmelee 2006) were not statistically significant in the full APC model utilized in this study. Accordingly, from a life-course perspective the findings from this study indicate that longitudinal changes in attitudes toward euthanasia and suicide for terminally ill persons are attributable mainly to age and period effects. Hypothesis three of this study stated that the influence of cohort membership on longitudinal approval of euthanasia and suicide for terminally ill persons is determined by the stratification of experience, where individuals' locations across a variety of social domains such as gender, race, and religious affiliation moderate the effects of cohort membership on attitudes toward euthanasia and suicide. Because I found no significant cohort effects, hypothesis three of this study was not supported by the findings.

Although hypothesis three was not supported by the findings, I did control for the effect of gender, race, education, political affiliation, and religious affiliation at the individual, rather than cohort, level. The purpose of this extension of the model was to examine if the significant age and period 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), whites were more likely to support (DeCesare 2000; Jorgenson and Neubecker 1980; Lichtenstein et al. 1997; Wasserman, Clair and Ritchey 2006), democrats and those who were independent or in an "other

party" were more likely to support (DeCesare 2000), and Protestants, Catholics, Jewish individuals, and those who reported belonging to an "other religion" were less likely to support compared to those who reported no religious affiliation (Burdette, Hill and Moulton 2005; DeCesare 2000). Previous research (Blackhall et al. 1999; Finlay 1999) finds a negative relationship betweene education and these attitudes. However, I found a small but positive relationship in which those with higher education levels are more likely to support euthanasia and suicide.

In addition to these previously documented individual-level determinants of attitudes toward euthanasia and suicide, I also controlled for the number of children had by the respondent at the time of survey as well as marital status. Controlling for the other demographic factors as well as the age and period effects, there was a positive relationship between number of children and support for euthanasia and suicide. Similarly, those who were divorced or separated were more likely to support euthanasia and suicide compared to those who were married at the time of survey. The results indicate that social bonds to others, in this case children and marital partners, decrease the likelihood of supporting the voluntary ending of life.

The overarching goal of this study was to examine broad social changes in attitudes toward euthanasia and suicide for terminally ill persons over the past 37 years. Drawing on life course sociological theory, I examined micro and macro level social processes that affect changes in these attitudes over time. Given the significant age and period effects and insignificant cohort effects found by 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 and 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 quantitative research should seek to better explicate this possibility. Beyond the individual level, this study finds that attitudes change with the passage of time. 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 level 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 the continued stabilization of these attitudes.

6   CONCLUSION

The results of this study improve our understanding of attitudes toward euthanasia and suicide for terminally ill persons in several important ways. First, the most pronounced social change in these attitudes can be seen from the years 1977 to 1998; from 2000 onward these attitudes remain relatively stable. Second, from a life-course perspective the broad changes in these attitudes evident in the 37-year period from 1977 to 2014 are mainly attributable to age and period effects. Contrary to previous findings, the changes in these attitudes over time are in fact not a function of population turnover or demographic metabolism. Rather, at the micro level individuals experience attitudinal change towards euthanasia and suicide as they age and at the macro level the American public shifts attitudes with the passage of time and experience of historical events. Third, this study shows that with the exception of educational attainment, previously found cross-sectional demographic determinants of these attitudes remain the same in the longitudinal context. Taken together, these findings highlight the importance of revisiting previously noted trends in sociological research. With the addition of 10 years of new survey data alongside developments in hierarchical linear modeling that surpass the identification problem in age-period-cohort analysis, the findings of this study are perhaps the most comprehensive longitudinal examination of changing attitudes toward euthanasia and suicide for terminally ill persons.

REFERENCES

Allen, Jen, Sonia Chavez, Sara DeSimone, Debbie Howard, Keadron Johnson, Lucinda LaPierre, Darrel Montero and Jerry Sanders. 2006. "Americans' Attitudes toward Euthanasia and Physician-Assisted Suicide, 1936-2002." *Journal of Sociology & Social Welfare* 33(2):5-23.

Allison, Paul D. 2002. *Missing Data*. Thousand Oaks, CA: Sage.

Alwin, Duane F. and Ryan J. McCammon. 2003. "Generations, Cohorts, and Social Change " Pp. 23-49 in *Handbook of the Life Course*, edited by J. T. Mortimer and M. J. Shanahan. New York: Plenum Publishers.

Baunach, Dawn Michelle. 2011. "Decomposing Trends in Attitudes toward Gay Marriage, 1988–2006." *Social Science Quarterly* 92(2):346-63. doi: 10.1111/j.1540-6237.2011.00772.x.

Baunach, Dawn Michelle. 2012. "Changing Same-Sex Marriage Attitudes in America from 1988 through 2010." *Public Opinion Quarterly* 76(2):364-78. doi: 10.1093/poq/nfs022.

Benson, John M. 1999. "Trends: End-of-Life Issues." *Public Opinion Quarterly* 63(2):263-77.

Blackhall, Leslie J., Gelya Frank, Sheila T. Murphy, Vicki Michel, Joycelynne M. Palmer and Stanley P. Azen. 1999. "Ethnicity and Attitudes Towards Life Sustaining Technology." *Social Science & Medicine* 48(12):1779-89. doi: http://dx.doi.org/10.1016/S0277-9536(99)00077-5.

Bobo, Lawrence D., Camille Z. Charles, Maria Krysan and Alicia D. Simmons. 2012. "The Real Record on Racial Attitudes." Pp. 38-83 in *Social Trends in American Life: Findings from the General Social Survey since 1972*, edited by P. V. Marsden. Princeton, NJ: Princeton University Press.

Bolzendahl, Catherine I. and Daniel J. Myers. 2004. "Feminist Attitudes and Support for Gender
    Equality: Opinion Change in Women and Men, 1974–1998." *Social Forces* 83(2):759-89.
    doi: 10.1353/sof.2005.0005.

Blendon, Robert J., John M. Benson and Joachim O. Hero. 2014. "Public Trust in Physicians-
    U.S. Medicine in International Perspective." *The New England Journal of Medicine*
    371(17):1570-72.

Braveman, Paula, Susan Egerter and David R. Williams. 2011. "The Social Determinants of
    Health: Coming of Age." *Annual Review of Public Health* 32(1):381-98. doi:
    doi:10.1146/annurev-publhealth-031210-101218.

Burdette, Amy M., Terrence D. Hill and Benjamin E. Moulton. 2005. "Religion and Attitudes
    toward Physician-Assisted Suicide and Terminal Palliative Care." *Journal for the
    Scientific Study of Religion* 44(1):79-93.

Bury, Michael. 1982. "Chronic Illness as Biographical Disruption." *Sociology of Health &
    Illness* 4(2):167-82.

Campbell, Karen E. and Peter V. Marsden. 2012. "Gender Role Attittudes since 1972: Are
    Southerners Disctinctive?" Pp. 84-116 in *Social Trends in American Life: Findings from
    the General Social Survey since 1972*, edited by P. V. Marsden. Princeton, NJ: Princeton
    University Press.

Curran, Patrick M. 1998. "Regulating Death: Oregon's Death with Dignity Act and the
    Legalization of Physician-Assisted Suicide." *The Georgetown Law Journal* 86.

Davis, James. 2012. "On the Seemingly Relentless Progress in American's Support for Free
    Expression, 1972-2006." Pp. 19-37 in *Social Trends in American Life: Findings from the*

General Social Survey since 1972, edited by P. V. Marsden. Princeton, NJ: Princeton University Press.

Davis, James A. 1975. "Communism, Conformity, Cohorts, and Categories: American Tolerance in 1954 and 1972-73." *American Journal of Sociology* 81(3):491-513. doi: 10.2307/2777641.

DeCesare, Michael A. 2000. "Public Attitudes toward Euthanasia and Suicide for Terminally Ill Persons: 1977 and 1996." *Social Biology* 47(3/4):264-76.

DeSpelder, Lynne Ann and Albert Lee Strickland. 2015. *The Last Dance: Encountering Death and Dying*. New York, NY: McGraw Hill.

Duncan, O.D. and L.F. Paremelee. 2006. "Trends in Public Approval of Euthanasia and Suicide in the Us, 1947-2003." *Journal of Medical Ethics* 32(5):266-72.

Elder, Glen H. 1994. "Time, Human Agency, and Social Change: Perspectives on the Life Course." *Social Psychology Quarterly* 57(1):4-15. doi: 10.2307/2786971.

Elder, Glen H. 1998. "The Life Course as Developmental Theory." *Child Development* 69(1):1-12.

Fienberg, S.E. and W. M. Mason. 1979. "Identification and Estimation of Age-Period-Cohort Models in the Analysis of Discrete Archival Data." *Sociological Methodology* 10:1-67.

Finlay, Barbara. 1985. "Right to Life Vs the Right to Die- Some Correlates of Euthanasia Attitudes." *Sociology and Social Research* 69(4):548-60.

Firebaugh, Glenn and Kenneth E. Davis. 1988. "Trends in Antiblack Prejudice, 1972-1984: Region and Cohort Effects." *American Journal of Sociology* 94(2):251-72. doi: 10.2307/2780775.

Firebaugh, Glenn. 1997. *Analyzing Repeated Surveys*. Thousand Oaks, CA: Sage.

Glenn, Norval D. 2005. *Cohort Analysis, Second Edition*. Thousand Oaks, CA: Sage.

Hardy, Susan E., Heather Allore and Stephanie A. Studenski. 2009. "Missing Data: A Special
Challenge in Aging Research." *Journal of the American Geriatrics Society* 57(4):722-29.
doi: 10.1111/j.1532-5415.2008.02168.x.

Hox, Joop J. 2010. *Multilevel Analysis: Techniques and Procedures, Second Edition*. New York,
NY: Routledge.

Huxtable, Richard. 2013. *Euthanasia: All That Matters*. London: Hodder & Stoughton.

Jorgenson, DE and RC Neubecker. 1980. "Euthansia: A National Survey of Attides toward
Voluntary Termination of Life." *Journal of Death and Dying* 11(4):281-91.

Lichtenstein, Richard L., Kirsten H. Alcser, Amy D. Corning, Jerald G. Bachman and David J.
Doukas. 1997. "Black/White Differences in Attitudes toward Physician-Assisted
Suicide." *Journal of the National Medical Association* 89(2):125-33.

Loftus, Jeni. 2001. "America's Liberalization in Attitudes toward Homosexuality, 1973 to 1998."
American Sociological Review 66(5):762-82. doi: 10.2307/3088957.

Mannheim, Karl. 1972. "The Problem of Generations." Pp. 276-320 in *Essays on the Sociology
of Knowledge*, edited by P. Kecskemeti. London: Routledge.

Marengoni, Allessandra, Sara Angleman, Rene Melis, Francesca Magialasche, Anita Karp,
Annika Garmen, Bettina Meinow and Laura Fratiglioni. 2011. "Aging with
Multimorbidity: A Systematic Review of the Literature." *Ageing Research Reviews*
10(4):430-39.

Mason, W. M., and S.e. Fienberg. 1985. *Cohort Analysis in Social Research: Beyond the
Identification Problem*. New York: Springer.

Mayer, Karl Ulrich. 2009. "New Directions in Life Course Research." *Annual Review of Sociology* 35:413-33.

Moulton, Benjamin E., Terrence D. Hill and Amy Burdette. 2006. "Religion and Trends in Euthanasia Attitudes among U.S. Adults, 1977-2004." *Sociological Forum* 21(2):249-72.

Newman, Katherine S. 2003. *A Different Shade of Gray: Midlife and Beyond in the Inner City*. New York, NY: The New Press.

Rabe-Hesketh, S., & Skrondal, A. 2012. *Multilevel and Longitudinal Modeling Using Stata Volume 1: Continous Responses, 3rd Edition.* College Station, Texas: Stata Press.

Raudenbush, S., Bryk, A., Cheong, Y., Congdon, R., & du Toit, M. 2011. *HLM 7: Hierarchical Linear and Nonlinear Modeling*. Illinois: Scientific Software International Inc.

Riffkin, Rebecca. 2014. "New Record Highs in Moral Acceptability." Vol.: Gallup.

Ryder, Norman B. 1965. "The Cohort as a Concept in the Study of Social Change." *American Sociological Review* 30(6):843-61.

Ruel, Erin, William E. Wagner, and Brian J. Gillespie. 2016. *The Practice of Survey Research: Theory and Applications*. Thousand Oaks, CA: Sage.

Singh, B.K. 1979. "Correlates of Attitudes toward Euthanasia." *Biodemography and Social Biology* 26(3):247-54.

Snijders, Tom and Roel J. Bosker. 2012. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling, 2nd Edition*. Thousand Oaks, CA: Sage.

Starr, Paul. 1982. *The Social Transformation of American Medicine.* United States: Basic Books.

Warner, Rebecca M. 2013. *Applied Statistics: From Bivariate Through Multivariate Techniques*. Thousand Oaks, CA: Sage.

Wasserman, Jason, Jeffrey Michael Clair and Ferris J. Ritchey. 2006. "Racial Differences in Attitdues toward Euthansia." *Journal of Death and Dying* 52(3):263-87.

Wiener, Joshua M and Jane Tilly. 2002. "Population Ageing in the United States of America: Implications for Public Programmes." *International Journal of Epidemiology* 31(4):776-81. doi: 10.1093/ije/31.4.776.

Yang, Yang. 2008. "Social Inequalities in Happiness in the United States, 1972 to 2004: An Age-Period-Cohort Analysis." *American Sociological Review* 73(2):204-26.

Yang, Yang and Kenneth C. Land. 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, Yang and Kenneth C. Land. 2008. "Age–Period–Cohort Analysis of Repeated Cross-Section Surveys: Fixed or Random Effects?". *Sociological Methods & Research* 36(3):297-326. doi: 10.1177/0049124106292360.

Yang, Yang and Kenneth C. Land. 2013. *Age-Period-Cohort Analysis: New Models, Methods, and Empirical Applications*. Boca Raton, FL: CRC Press.

APPENDICES

Appendix A. Examination of Missing Data

An examination of missing data is important in any statistical model. There are several

sources of missing data in survey-based research, including nonresponse from study participants

or attrition of participants over time (Ruel, Wagner, and Gillespie 2016). Because the General

Social Survey employs a repeated cross-sections design, this study does not suffer from the

attrition of participants that is common in most life course research utilizing longitudinal panel

data (see Hardy, Allore, and Studenski 2009). However, in this study there are issues of

nonresponse from participants that warrant discussion.

The regression models employed in this research utilize listwise deletion of data.

Listwise deletion of data occurs when a participant is dropped from the analysis because of

missing data on any variable entered into a model (Allison 2002). By removing from the sample

all individuals with missing values on any of the study variables, the overall sample in this study

is reduced from 47,249 to 28,493 individuals. It is important to explain why so many

individuals were dropped. Beginning in 1988, both dependent variables in the analysis were

only asked of approximately two-thirds of participants sampled in each cross-section for the GSS

study design. The logic behind this design is that by dividing the entire GSS sample into

randomized thirds, not all questions have to be asked of all study participants, which ultimately

reduces the cost and time of administering the survey.

The GSS designates missing data with three distinct "missing data codes." In Stata, these

codes are ".d" if the respondent reported not knowing the answer to a question, ".i" if the

respondent was ineligible to answer the question, and ".n" if the respondent was not asked a

question due to a skip pattern. Across all survey years, approximately one-third of participants

are ".i" on the dependent variables in this analysis because they simply were not asked the two

questions (1 for suicide and 1 for euthanasia). More specifically, 15,471 individuals were

listwise deleted from the analysis because they were never presented with the questions

regarding euthanasia or suicide for terminally ill persons. Accordingly, 3,295 individuals were

listwise deleted from the analysis due to missing data on independent variables in the regression

models.

In order to further explore the issue of missing data in this analysis, I utilized Stata's

"misstable" command to generate unique patterns of missing data. These patterns are displayed

in table 6. I specifically conducted two separate analyses of missing data. In the first analysis, I

retained all ".d", ".i", and ".n" codes as missing values. The missing data patterns indicate that

when including ".i" individuals in the sample, 60% of all cases have no missing data, whereas

33% of cases have missing data on both the euthanasia and suicide measure. A significantly

smaller percent of cases (5% total) are missing due to nonresponse on either measure. In the

second analysis, I retained only ".d" and ".n" codes as missing to better understand the patterns

for participants who reported "not knowing" if they supported euthanasia or suicide, or for

participants who were not asked these questions due to a skip pattern. The missing data patterns

here indicate that 92% of individuals had no missing data. Compared to the first analysis, only

1% of individuals were missing on both euthanasia and suicide measures, whereas a total of 6%

were missing due to nonresponse on either measure.

Considering this information, it is highly unlikely that the sample retained for this

analysis is no longer generalizable to the larger U.S. population. Because participants were

randomly assigned to question groups, their responses should still generalize back to the sample,

and subsequently back to the overall population. Furthermore, if we consider the ".d" and ".n"

Table 6. Missing Data Patterns Due to Listwise Deletion

	Missing Data Patterns With "Inapplicable" Values Retained															
%	Divorced	Never Married	Separated	Widowed	Education	Children	Age	Catholic	Jewish	Other Religion	Protestant	Democrat	Independent	Other Party	Suicide	Euthanasia
60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1

	Missing Data Patterns With "Inapplicable" Values Listwise Deleted															
%	Divorced	Never Married	Separated	Widowed	Education	Children	Age	Catholic	Jewish	Other Religion	Protestant	Democrat	Independent	Other Party	Suicide	Euthanasia
92	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0

Note: A value of 1 indicates that all values of the variable are nonmissing. A value of 0 indicates that all values are missing. Missing data patterns caused by less than 1 percent of the sample are excluded from this table.

cases to be the true missing data, only 8% of the overall sample is dropped due to listwise deletion. Such a reduction is common in almost all statistical analyses. Moreover, my sample size mirrors previous research on this topic utilizing the pooled GSS data. For example, Moulton, Hill, and Burdette (2006) report a sample size of 19,398 in their analyses of changing attitudes toward euthanasia from 1977-2004.