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# Trajectories of alcohol consumption among the elderly widowed population: A semi-parametric, group-based modeling approach

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ABSTRACT

Even though research on the use, misuse, and abuse of alcohol among the elderly has burgeoned in recent decades (see reviews by Johnson, 2000; Kirchner et al., 2007; Patterson & Jeste, 1999), only a few empirical studies have explored the post-bereavement alcohol consumption trajectories among the elderly widowed population. To fill this research gap, this study aims to examine the temporal processes underlying the relationship between widowhood and subsequent drinking behaviors among the elderly widowed population and to examine the potential predictors of these trajectories. The empirical work of this study is based on longitudinal data from the 1992 to 2008 Health and Retirement Study (HRS). A semi-parametric mixture model (SPMM) is used to estimate the distinctive trajectories of post-bereavement alcohol consumption. Results reveal that the type of drinking trajectory that characterize the post-bereavement drinking behavior of an individual is largely dependent upon the characteristics of the individuals (e.g. gender), the health conditions and health behavior of deceased spouse, pre-bereavement alcohol consumption, and depression. Another important finding is that bereaved men seem to have greater difficulty overcoming the transitional burden associated with widowhood.



## 1. Introduction

Even though research on the use, misuse, and abuse of alcohol among the elderly has burgeoned in recent decades (Johnson, 2000; Moos, Schutte, Brennan, & Moos, 2010; Patterson & Jeste, 1999), much of the existing research on gender, racial, and educational differences in alcohol consumption tend to focus on the entire elderly population. Only a few empirical studies have explored the alcohol consumption trajectories among the elderly widowed population post-bereavement (e.g. Byrne, Raphael, & Arnold, 1999; LaGreca, Akers, & Dwyer, 1988; Perreira & Sloan, 2001). This study fills a research gap by examining the temporal processes underlying the relationship between widowhood and subsequent drinking behaviors among the elderly widowed population and examining the potential predictors of these trajectories. To the best of my knowledge, this is one of the first studies that exploits the longitudinal nature of the 1992–2008 Health and Retirement Study (HRS) to examine what factors predict different post-bereavement drinking outcomes among widows and widowers.

## 2. Theoretical perspectives

Two theoretical approaches are useful for explaining the impact of spousal death on subsequent alcohol consumption trajectories: the crisis model and the chronic strain model. According to the *crisis model*, spousal death could lead to an increase in alcohol consumption in the short-term with limited effects in the long-term. In other words, the subsequent drinking effects would be greatest at the time of transition, when the individual experiences the greatest number of upheavals. However, the negative

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outcomes eventually subside over time as widowers ultimately recover from their loss and adjust to their new life situation. The *chronic strain model* argues that the negative effects of spousal death on subsequent drinking behaviors perpetuate over time and persist long after the death of the spouse. The crisis and chronic strain models have been widely used in studies of marital dissolution (i.e., divorce and separation) (see Booth & Amato, 1991; Johnson & Wu, 2002) but few researchers have applied them to post-bereavement alcohol consumption.

## 3. Review of relevant literature

Findings pertaining to effects of spousal death on subsequent alcohol consumption are mixed. While some researchers found increased alcohol consumption following spousal death (e.g. Byrne et al., 1999), other researchers failed to find a similar association (e.g. LaGreca et al., 1988), and still others speculated a decline in alcohol consumption following the loss of a spouse (e.g. Atkinson & Kofoed, 1982; Pienta & Franks, 2006).

Evidence in the United States and Australia reveal that the risk of alcohol consumption may increase following spousal death (see Byrne et al., 1999; Perreira & Sloan, 2001), as widows may view drinking as a way of reducing stress and coping with the loss of spouse, especially in the initial months of widowhood (Pienta & Franks, 2006; Wells & Kendig, 1997). These emotions are most apparent immediately following the death of a spouse (Umberson, Wortman, & Kessler, 1992). Alcohol consumption may also decrease following the loss of a spouse, especially if the spouse was a drinking partner, as marriage can offer individuals a shared lifestyle (Pienta & Franks, 2006). This is especially true for females who were married to a male alcoholic (Brennan, Moos, & Kim, 1993).

Recently widowed elderly men are especially prone to increased alcohol consumption for a year or more after a loss (Byrne et al., 1999; Dar, 2006). Researchers in Australia found a significant interaction effect between death of spouse and baseline alcohol consumption ($p = 0.048$) with men who consumed greater amounts of alcohol at baseline being more likely to increase their alcohol consumption following conjugal bereavement (Byrne et al., 1999). An alternative explanation for widowed men's increased likelihood to engage in excessive drinking is related to the loss of spousal care and control.

To my knowledge, empirical data on racial differences in post-bereavement alcohol consumption are virtually non-existent. Only one study, conducted by Molgaard et al., explored the issue. They found no significant difference in that the prevalence of drinking between Whites, followed by Mexican American after age 65 (Molgaard, Nakamura, Stanford, Peddecord, & Morton, 1990).

The few empirical studies examining the effects of education on alcohol consumption among the elderly have mixed findings. Carlson (1994) and Gomberg (1990) found that those with less than a high school education have the highest risk of developing drinking-related problems as older adults. However, other researchers (Kubansky, Berkman, Glass, & Seeman, 1998) found a non-linear association between that alcohol consumption and educational attainment. Their analysis of data from the MacArthur Research Network on Successful Aging Community Study revealed that alcohol consumption was significantly higher among individuals who have completed some or all of their high school education than their counterparts with either less than a high school education or education beyond high school (Kubansky et al., 1998).

Findings pertaining to the relationship between income and alcohol consumption are also equivocal. Gomberg (1990) found that the rates of alcohol abuse and dependence are higher among the elderly from low income households while Woodruff et al. (2009) found that higher alcohol risk among with those with higher income.

Researchers in most Western and developed countries have demonstrated that there is a strong association between post-bereavement depression and spousal's prior health conditions. These researchers tend to focus on one health condition and found that post-bereavement depression has been linked to stroke and cancer (Carnelley, Wortman, & Kessler, 1999). Spousal illness or death may deprive their partner of emotional, social, economic or other practical support (Umberson et al., 1992) which may cause the caregiving partner to turn to alcohol as a way to alleviate their depressive symptoms (Christakis & Allison, 2006). Research on post-bereavement depression on subsequent alcohol consumption remains scant. Living alone is also associated with higher levels of unhealthy alcohol use among elderly men in Finland, Italy, and the Netherlands (van Gelder et al., 2006).

## 4. Method of analysis

Group-based modeling is used to describe and identify the trajectories, patterns, and changes over time in alcohol consumption among the elderly widowed population. Group-based modeling, a type of latent class growth analysis, was pioneered by Daniel Nagin and Kenneth Land in 1993. Unlike the traditional regression or growth curve model, it assumes a number of discrete classes, each having a fixed intercept and slope and an estimate of population prevalence (Jones, Nagin, & Roeder, 2001). This approach uses a probability function and a semi-parametric mixture modeling (SPMM) approach to classify and assign individuals to their distinctive drinking trajectories based on the patterns of their longitudinal trajectories (Broadbent, Thomson, & Poulton, 2008; Jones et al., 2001; Nagin, 1999). Under this approach, clusters of individuals with similar developmental trajectories of alcohol consumption over time were identified using the PROC TRAJ procedure in SAS procedure. The PROC-TRAJ software is available on-line (http://www.andrew.cmu.edu/user/bjones/index.html). Respondents are assigned to the trajectory for which they have the largest posterior probability estimate—the group that best conforms to the individual's observed drinking behavior. Subjects with a high probability (i.e., $p > 0.7$) of a specific trajectory group were included from further analyses because they were considered correctly assigned to a specific post-bereavement alcohol use groups. Bayesian Information Criterion (BIC) is used to determine the optimal number of