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Feeling Older and Driving Less: The Effect of Age Identity on Older Adults' Transition from Driving

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Abstract

Background and Objectives: Prior research examining predictors of older adults' transition from driving has not considered age-related perceptions, such as age identity, that could shape decisions to limit, or self-regulate, one's driving. Our study examines this possibility, testing the hypothesis that older (or less youthful) identities predict greater self-regulated driving.
Research Design and Methods: Using two waves of the National Health and Aging Trends Study (NHATS, 2011 and 2015), we run negative binomial regression models predicting the number of self-regulated driving behaviors, as a function of baseline age identity and change in age identity between the waves. Models control for factors shown to predict self-regulated driving, namely sociodemographics, health, and transportation support.
Results: Supporting our hypothesis, we find that older (or less youthful) identities at baseline and greater increases in age identity between the waves predict more self-regulated driving behaviors 4 years later, controlling on these behaviors at baseline. The results held in models controlling for sociodemographics, health, and transportation alternatives, suggesting that age identity exerts an independent effect on self-regulated driving.
Discussion and Implications: Our study reveals that age identity affects later life driving decisions, contributing to our understanding of the process of transitioning from driving. It also adds to the long list of consequences of age-related perceptions revealed in prior research, much of it focused on health but not behaviors. Directions for future research include examining other age-related perceptions, such as aging anxieties or attitudes, and exploring the likely bidirectional process linking age-related perceptions and driving transitions.

> **Translational Significance:** Older adults who report feeling older than their actual age are more likely to opt out of driving at night, in the rain, on busy roads, or when alone.

Keywords: Subjective aging, Subjective age, Transportation

Background and Objectives

A common experience in later life is the gradual withdrawal from driving situations that reduce feelings of confidence or safety, like in bad weather or heavy traffic.

Though seemingly minor, these "micro-transitions" often pave the way to driving cessation—a transition associated with declines in health and well-being (for a review, see Chihuri et al., 2016). Given these effects, some research

has focused on identifying predictors of driving cessation, as well as the self-regulated driving behaviors often preceding it (e.g., Barrett, Gumber, & Douglas, 2017; Choi, Adams, & Kahana, 2013; Kostyniuk & Molnar, 2008; Molnar et al., 2015). Prior studies of later life driving transitions, however, have given limited attention to the possible impact of individuals' inner experience of their age and aging process—perceptions likely to shape assessments of physical and cognitive abilities and, therefore, decisions about driving.

Our study addresses this issue, using a nationally-representative panel study of Americans aged 65 years and older followed over 4 years. While any number of age-related perceptions, such as attitudes toward older adults, subjective life expectancy, and aging anxiety, may influence later life driving transitions, we focus on age identity. Also referred to as subjective age, this dimension of age-related perceptions is the one most commonly examined in gerontological research and the one most widely available in national data sets. In short, we test the hypothesis that younger identities postpone transitions away from driving, while older identities hasten them. Our study breaks new ground in the study of older adults' mobility by examining a relatively unexplored domain of possible predictors of later life driving decisions. By advancing the understanding of such decisions, our study can aid in the design of interventions to facilitate well-timed, individualized transitions that improve roadway safety while maintaining older adults' autonomy and social integration.

Prevalence and Consequences of Transitions from Driving

Withdrawing from driving is a transition that many people eventually face. Approximately one third of older Americans have not driven in the past month, while more than 1 in 10 older drivers hang up their keys over a 5-year period (Barrett et al., 2017; Choi et al., 2013). But unlike many other later life transitions, like becoming a widow or grandparent, the transition from driving is often not a single event—but rather involves a sequence of decisions to self-regulate one's driving. Research finds that between a quarter and a half of older adults, depending on the age of the sample, limit their driving in some way—often by not driving alone, at night, in the rain, on highways, or during rush hour (Barrett et al., 2017; Charlton et al., 2006; Molnar & Eby, 2008).

Although common, the transition from driving is not without consequences, as driving is a highly-valued activity with social, cognitive, and physical benefits. A study of older Australians, for example, found that they ranked driving the second most important instrumental activity of living—behind "use of transportation" and ahead of reading and medication management (Fricke & Unsworth, 2001). Consistent with these reports, transitioning from driving is associated with a range of negative consequences, including greater social isolation, lower social engagement (e.g.,

participation in paid work or volunteering), higher risk of depression, greater risk of entering a long-term care facility, worse cognitive functioning, and even shorter life expectancy (for a review, see Chihuri et al., 2016). For example, Edwards, Perkins, Ross, & Reynolds (2009) found that older, community-dwelling adults who ceased driving were four to six times more likely to die over the 3 years of their study, controlling for initial health status. The wide-ranging consequences of transitioning from driving underscore the importance of identifying factors influencing older adults' driving decisions.

Predictors of Transitions from Driving

Studies have revealed sociodemographic factors influencing later life driving decisions, including age, gender, race, socioeconomic status (SES), and household composition or living arrangements. Not surprisingly, older age predicts greater driving self-regulation (e.g., Charlton et al., 2006; Kostyniuk & Molnar, 2008). As an illustration, adults aged 85 years or older have odds of avoiding driving in heavy traffic that are five times that of those aged 65–74 years old (Kostyniuk & Molnar, 2008). Often exerting a stronger effect than age (or even health) is gender, with women more likely to restrict their driving than are men (e.g., Barrett et al., 2017; Morgan, Winter, Classen, McCarthy, & Awadzi, 2009). For example, Barrett and colleagues (2017) find that women are two to three times more likely than men to avoid driving at night, in bad weather, in heavy traffic, or alone. Other sociodemographics influencing driving transitions are race and socioeconomic status—with persons of color and those of lower SES more likely to limit their driving (e.g., Barrett et al., 2017; Choi, Mezuk, Lohman, Edwards, & Rebok, 2012; Molnar et al., 2015). Results are more mixed for household composition or living arrangements, with some studies reporting more driving self-regulation or higher risk of driving cessation among those living alone (e.g., Betz & Lowenstein, 2010; Choi et al., 2013) and others reporting no association (e.g., Edwards et al., 2008; Ragland, Satariano, & MacLeod, 2004).

Another consistent predictor of transitioning from driving is health. This observation stems from the numerous physical and cognitive demands involved in driving, many of which tend to decline with age. For example, the importance of driving-related information acquired through the sense of sight makes vision problems especially influential determinants of later life driving (Kostyniuk & Molnar, 2008; Meng & Siren, 2015). But many other health dimensions also are associated with transitioning from driving. Studies report greater likelihood of driving self-regulation or cessation among those with cognitive disorders, worse self-rated health, and greater functional impairment (e.g., Barrett et al., 2017; Edwards et al., 2008; Kostyniuk & Molnar, 2008; Vance et al., 2006).

Transitioning from driving also is influenced by the availability of transportation alternatives (e.g., Barrett

et al., 2017; Choi et al., 2012; Ichikawa, Nakahara, & Takahashi, 2016). For example, a longitudinal study of older Floridians found that receiving frequent rides in the past year from friends, neighbors, organizations, or hired assistants increased the odds of driving cessation over a 2-year period, with the strongest effect found for rides from friends and neighbors (Choi et al., 2012). Similarly, a study conducted in Japan found that reporting the availability of someone who could provide a ride increased the odds of driving cessation (Ichikawa et al., 2016).

Though receiving limited attention in prior studies, age-related perceptions—like age identity—are likely to influence later life driving decisions. The prediction derives from the general observation that people's identities shape the roles they acquire, along with the way they are performed and the salience they hold (Burke & Reitzes, 1981). Applied to our study, having a youthful identity (and desiring to maintain it) may encourage the holding in later life of roles more closely associated with youth than old age. One such role is that of driver—for oneself and perhaps one's aging spouse or partner and friends. Driving is, after all, viewed as an activity that young and middle-aged, not old, people do—or at least not well—according to dominant cultural images of older drivers. These images are contradicted by older drivers' lower frequency of distracted driving and fewer crashes, particularly compared with teen drivers (Schroeder, Wilbur, & Peña, 2018; Tefft, 2017)—but they are pervasive. Providing evidence of the older driver stereotype, a study of an online social media and networking platform found that driving was one of two activities participants wanted to ban older people from doing (Levy, Chung, Bedford, & Navrazhina, 2014).

The possibility that age identity influences the transition from driving also is supported by studies examining other age-related perceptions and behaviors—though their predictions for our study vary. Research reveals that a smaller discrepancy between one's own age and the age at which s/he views a person as "old"—which may be viewed as reflecting an older identity—is associated with more positive views of older drivers, as well as less support for roadway safety measures targeting them (Ferring, Tournier, & Mancini, 2015). Interpreted by the study's authors as indicating a self-protective strategy of older drivers, these findings raise the possibility that older identities may predict less rather than more self-regulated driving. However, the opposite effect also is plausible. Older identities may lead to negative self-assessments of physical abilities—and perhaps greater willingness to attribute declines to aging—both of which may increase self-regulated driving. Consistent with this prediction, experimental research reveals that priming older adults with negative stereotypes of older drivers leads to worse performance and lower confidence in driving simulations (Chapman, Sargent-Cox, Horswill, & Anstey, 2016; Joanisse, Gagnon, & Voloaca, 2013). Lending further support are studies revealing that older identities can lead to decisions to restrict one's behavior, such as exercising less

frequently (Barrett & Toothman, 2014; Wurm, Tomasik, & Tesch-Romer, 2010).

Our study is, to our knowledge, the first to examine the possible effect of age identity (or any other age-related perception) on later life driving decisions. We test the hypothesis that older (or less youthful) identities predict greater self-regulated driving—a prediction we examine using a nationally-representative panel study of older Americans followed across 4 years. The use of panel data permits the examination of change in self-regulated driving, accounting for baseline levels of not only self-regulated driving but also health. Our study yields insight on factors influencing later life driving decisions, which have implications for roadway safety, as well as older adults' health and well-being.

Research Design and Methods

Sample

We use data from the National Health and Aging Trends Study (NHATS), an annual panel survey begun in 2011 and aimed at examining late-life disability trends and their social and economic consequences (Kasper & Freedman, 2016; NHATS Public Use Data, 2011–2015). Sponsored by the National Institute on Aging (grant number NIA U01AG032947) and conducted by Johns Hopkins Bloomberg School of Public Health, NHATS is a nationally representative sample of Medicare enrollees aged 65 years and older and includes oversamples of black, non-Hispanic persons and those of more advanced age. Of the 12,411 individuals selected for possible participation in NHATS, 979 were ineligible for further study (e.g., deceased, unable to be located), with another 3,187 identified as nonrespondents—yielding an initial sample of 8,245 older adults.

We limited our analytic sample in several ways. First, we omitted respondents in nursing homes or without complete survey data ($n = 636$). We also omitted respondents who required a proxy to complete Wave 1 ($n = 583$) or reported in that wave that they had not driven in the past month ($n = 1,915$). These criteria omitted 3,134 respondents from the sample, the majority of whom were omitted due to not driving in the past month. We also omitted respondents not completing Wave 5, as our analyses use responses from Waves 1 to 5 to examine change in self-regulated driving over the four intervening years. We selected this time interval and spacing of datapoints to permit more change to be observed in age identity and self-regulated driving. Omitting respondents not completing Wave 5 ($n = 2,212$), requiring a proxy interview ($n = 193$), no longer driving ($n = 366$), or missing on any of the independent variables ($n = 220$), yielded a sample of 2,120 older drivers. Compared with those included in the analytic sample, those omitted were significantly older and more likely to be female, non-white, and unmarried. They also reported fewer years of education, worse health, and more self-regulated driving behaviors and were less likely to be homeowners or receive transportation support from family or friends.

Measures

Variables used in analyses are described in Table 1. Consistent with other studies (e.g., Barrett & Gumber, 2018; Schafer & Shippee, 2010), age identity is measured as the discrepancy between felt and actual age, with higher values indicating older identities. We examine a measure of age identity at baseline, as well as a measure of change in age identity between the waves (Time 2–Time 1). Respondents felt, at baseline, approximately 13 years younger than their actual age and reported identities that were, on average, 3 months older at follow-up. Further descriptive analyses (not shown) revealed that approximately 49% reported older identities at follow-up than baseline, 42% reported younger identities, and 9% had no change. We examine the count of the following self-regulated driving behaviors respondents engaged in during the past month—avoiding driving at night, alone, on busy roads or highways, and in the rain or other bad weather. We control for demographic factors shown to influence driving in later life, including age, gender, race, SES (measured by homeowner status and educational attainment), and marital status. Health status is measured using five indicators: self-rated health, self-rated memory, physical capacity, count of chronic conditions, and self-reported vision problems. We control for transportation support using a dichotomous variable indicating recent receipt of a ride from family or friends.

Analytic Strategy

We use negative binominal regression, given the positively-skewed distribution of the count of self-regulated driving behaviors. Using data collected at Time 1, we ran a cross-sectional model regressing driving self-regulation on age identity. We then conducted longitudinal analyses regressing Time 2 driving self-regulation on Time 1 age identity and change in age identity between the waves. Both cross-sectional and longitudinal analyses control for sociodemographic factors, health, and transportation support, all measured at Time 1. All models are weighted to account for survey design.

Results

Table 2 reports the results of cross-sectional models regressing count of self-regulated driving on age identity and the controls (i.e., sociodemographics, health, and transportation support). The results indicate that engaging in more self-regulated driving behaviors is associated with being older, female, and non-white and having worse health, including worse self-rated memory, lower physical capacity, and vision problems. Receiving transportation support from a family member, friend, or paid help also is associated with more self-regulated driving. The association with age identity is in the hypothesized direction, with older identities associated with more driving self-regulation; however, the association is not statistically significant.

Table 3 reports the results of longitudinal analyses regressing the count of self-regulated driving behaviors at Time 2 on age identity and change in age identity between Time 1 and Time 2. The models also include the controls, along with the count of self-regulated driving behaviors at Time 1. We find evidence consistent with our hypothesis that older identities predict greater increases in self-regulated driving over the 4 years between waves. Results reveal a significant, albeit modest, effect of both baseline level of and change in age identity between the waves. Results also reveal greater increases in self-regulated driving among respondents who are older, female, and of race-ethnicities other than white, Hispanic, or Black. In addition, greater increases in self-regulated driving are found among those with worse self-rated health. However, the strongest predictor, not surprisingly, is reporting more self-regulated driving at Time 1.

Discussion and Implications

Transitioning away from driving is a common experience in later life—and a consequential one. It often begins with decisions to limit one's own driving in situations that reduce feelings of confidence or safety—an observation highlighting the importance of identifying factors shaping these decisions. Prior studies have revealed a number of them, including sociodemographic characteristics, health, and transportation support (e.g., Choi et al., 2012; Molnar et al., 2015). Our study is the first, of which we are aware, to consider the impact of age-related perceptions on later life driving decisions. We argue that such perceptions are likely to shape assessments of physical and cognitive abilities and, therefore, decisions about driving.

Drawing on studies examining other age-related perceptions and behaviors, we hypothesized that older (or less youthful) identities predict more self-regulated driving behaviors (Barrett & Toothman, 2014; Joanisse et al., 2013; Wurm et al., 2010). While the cross-sectional analyses revealed no significant association between age identity and number of self-regulated driving behaviors, the panel analyses revealed support for our hypothesis. Feeling older predicted engaging in more self-regulated driving behaviors 4 years later, controlling for their count at baseline. Further supporting the hypothesis, adopting older identities between the waves also predicted engaging in more self-regulated driving at follow-up.

Our study contributes to the small literature on behavioral consequences of age identity (or other age-related self-perceptions) by revealing its effect on driving—a social realm with implications for not only individuals' health and well-being but also public safety. However, unlike studies revealing, for example, the beneficial effects of youthful identities on physical exercise (Barrett & Toothman, 2014; Wurm et al., 2010), our study draws into question whether such identities are always in individuals' and society's best interest. The answer depends on the correspondence

Table 1. Summary of Variables

Variable	Description	Mean (SD)	
Age	Chronological age in years; range = 65–95	74.22	(6.30)
Female	1 = female; 0 = male	0.52	
Non-Hispanic Black	1 = Non-Hispanic Black; 0 = all other race-ethnic groups	0.15	
Hispanic	1 = Hispanic; 0 = all other race-ethnic groups	0.03	
Non-Hispanic White	1 = Non-Hispanic White; 0 = all other race-ethnic groups	0.80	
Other Race-Ethnicity	1= other race-ethnicity; 0 = Non-Hispanic Black, Hispanic, or Non-Hispanic White	0.02	
Married	1 = married; 0 = formerly married or never married	0.61	
Education	"What is the highest degree or level of school you completed?"; range = 0 (no school) to 18 (master's, professional, or doctoral degree)	13.26	(3.31)
Homeowner	1 = homeowner; 0 = not a homeowner	0.87	
Self-rated Health	"Would you say that in general your health is excellent, very good, good, fair, or poor?"; range = 1 (poor) to 5 (excellent)	3.56	(1.00)
Self-rated Memory	"How would you rate your memory at the present time? Would you say it is excellent, very good, good, fair, or poor?"; range = 1 (poor) to 5 (excellent)	3.49	(0.91)
Physical Capacity	Scale measuring self-assessed ability to complete six paired tasks: walking 3 or 6 blocks, climbing 10 or 20 stairs, lifting and carrying 10 or 20 pounds, being able to bend or kneel down, being able to reach overhead with or without a heavy object, and being able to grasp small objects or open sealed jars using just their hands (Kasper, Freedman, & Niefeld, 2012). Difficulty scores (from 0 to 2) are summed across the paired tasks; range = 0 (low capacity) to 12 (high capacity)	10.39	(2.34)
Chronic Conditions	Number of chronic conditions experienced in the past year; range = 0 to 21.	2.01	(1.34)
Vision Problems	1 = has a vision problem; 0 = no vision problem	0.02	
Age Identity	Felt age - chronological age. Felt age measured using response to the following: "What age do you feel most of the time?" Higher values = older identities; range = −71 to 33	−13.20	(12.39)
Δ Age Identity	Age identity $_{Time\,2}$ − Age identity $_{Time\,1}$; range = −74 to 66	0.24	(12.68)
Self-regulated Driving	Count of positive responses to the following four questions: "In the last month, did you ever avoid driving at night? alone? on busy roads or highways? in the rain or other bad weather; range = 0 to 4	0.61	(1.00)
Self-regulated Driving (Time 2)	Same as above, but measured at Time 2 (2015)	0.80	(1.13)
Transportation Support	1 = received transportation support from family member, friend, or someone paid to help in the past month; 0 = did not receive transportation support	0.32	

Note: National Health and Aging Trends Study (2011 and 2015); *n* = 2,120.

Table 2. Negative Binomial Regression of Self-regulated Driving: Cross-sectional Analyses

	Incident Rate Ratio (*SE*)
Age	1.03 (0.01)***
Female	1.60 (0.16)***
Non-Hispanic Black[a]	1.41 (0.16)**
Hispanic[a]	2.41 (0.40)***
Other Race-ethnicity[a]	2.41 (0.52)***
Married	0.91 (0.07)
Education	0.98 (0.01)
Homeowner	0.85 (0.07)†
Self-rated Health	0.94 (0.05)
Self-rated Memory	0.86 (0.05)**
Physical Capacity	0.90 (0.01)***
Chronic Conditions	1.02 (0.04)
Vision Problems	1.69 (0.26)***
Transportation Support	1.53 (0.12)***
Age Identity[b]	1.01 (0.00)

Note: National Health and Aging Trends Study (2011).
[a]Reference group = non-Hispanic White. [b]Higher values = older identities; *n* = 2,120.
†*p* < .10; *p* < .05; **p* < .01; ***p* < .001.

Table 3. Negative Binomial Regression of Self-regulated Driving: Longitudinal Analyses

	Incident Rate Ratio (*SE*)
Age	1.04 (0.00)***
Female	1.69 (0.14)***
Non-Hispanic Black[a]	1.21 (0.13)†
Hispanic[a]	1.07 (0.18)
Other Race-ethnicity[a]	1.79 (0.42)*
Married	0.97 (0.07)
Education	0.98 (0.01)†
Homeowner	1.13 (0.09)
Self-rated Health	0.91 (0.04)*
Self-rated Memory	0.98 (0.04)
Physical Capacity	0.98 (0.01)
Chronic Conditions	1.01 (0.03)
Vision Problems	1.23 (0.14)†
Transportation Support	1.04 (0.01)
Age Identity[b]	1.01 (0.00)***
Δ Age Identity	1.01 (0.00)*
Self-regulated Driving (Time 1)	1.60 (0.05)***

Note: National Health and Aging Trends Study (2011 and 2015).
[a]Reference group = non-Hispanic White. [b]Higher values = older identities; *n* = 2,120.
†*p* < .10; *p* < .05; **p* < .01; ***p* < .001.

between age identity and driving ability, including accurate assessment of one's own. If youthful identities reflect adequate driving ability, the implications of our study are much like those of the exercise studies. They raise few concerns about detrimental consequences for individuals' health and well-being—or roadway safety. Such concerns

are considerable, however, if youthful identities do not correspond with accurate assessments of physical and cognitive capacity. Such identities and the postponement of driving cessation with which they are associated may, instead, reflect cultural pressure to avoid the devalued status of old—or may stem from well-placed concerns about driving cessation's effect on social integration, health, and well-being.

Assessing these possibilities, along with their divergent implications, will require research identifying the processes underlying the link between age identity and driving decisions. Studies are needed that incorporate information on driving ability and self-assessments of it—along with other factors shaping later life driving decisions, such as driving experience, confidence, anxiety, and comfort and readiness to stop driving (Gwyther & Holland, 2012; Ichikawa et al., 2016; Kandasamy, Carr, Meuser, Harmon, & Betz, 2017; Molnar et al., 2015). Indeed, these factors, though not measured in NHATS, are plausible mediators of the association between age identity and self-regulated driving. For example, older identities may diminish driving confidence, leading to more self-regulated driving, a prediction consistent with research finding that priming with negative age stereotypes reduces driving confidence (Chapman et al., 2016). Further examinations of these processes also should consider alternative measures of age identity. Employing the most commonly used measure, our study finds a linear effect of age identity on self-regulated driving, but it does not directly compare individuals who feel older than their actual age with those feeling younger. Different processes may link younger identities with less driving self-regulation and older identities with more of it. Though receiving limited attention, examining such possibilities would enrich our understanding of age identity more generally.

Other directions for research include the more distal effects of age identity, as well as the likely bidirectional relationship between age identity and driving decisions. Our study's findings for self-regulated driving—often a precursor to driving cessation (Dellinger, Sehgal, Sleet, & Barrett-Connor, 2001)—suggest that older identities also may predict the decision to stop driving altogether, but research should directly address this possibility. Pointing to another avenue for research, our study found that older identities predict more self-regulated driving, but the reverse may also be true: Engaging in more self-regulated driving may promote older identities. This prediction finds support in a national survey revealing that two-thirds of adults view inability to drive a car as a marker of old age (Pew Research Center, 2009). Further support is found in Eisenhandler's (1990) interview-based study revealing older adults' efforts to avoid an old age identity by continuing to hold a license and drive.

More broadly, our study paves the way for research examining links between driving and other age-related perceptions. We examine age identity, the only such measure available in NHATS, but other age-related

perceptions are likely to influence decisions to limit one's driving and eventually to stop driving altogether. As illustrations, transitioning away from driving may occur more rapidly among individuals with more negative attitudes about aging and more aging anxiety, particularly concerns about declining physical mobility and cognitive functioning. Raising other questions for further investigation, such views also may predict greater willingness to rely on driving alternatives. By providing a more complete picture of older adults' transitions away from driving, this line of inquiry will contribute to the creation of transportation and health policies designed to improve roadway safety while maintaining older adults' autonomy and social integration.

Conflict of Interest

None reported.

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