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Living Arrangements and Sleep-Related Outcomes Among Older Adults in China: A Panel Analytic Approach

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Abstract

It has been discussed previously that older adults' living arrangements are associated with mortality. This study investigated the relationships between older adults' living arrangements and sleep-related outcomes in China. The nationally representative sample included 4,731 participants who participated on two different occasions, with a total of 9,462 observations (2012 and 2014 waves). Panel logistic regression and panel ordinary least squares regression models were estimated with outcomes of sleep quality and average hours of sleep daily, respectively. Approximately 62% of individuals reported good quality of sleep. We observed that older adults who lived with family members had 17% greater odds of reporting good quality of sleep (adjusted odds ratio = 1.17, 95% confidence interval [1.03, 1.34], $p < .05$) and reported

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longer sleep duration daily ($\beta = .334$, standard error $= .069$, $p < .01$), compared with those who lived alone. Social support is needed to strengthen the residential relationship, especially with family members.

Keywords
older adults, sleep quality, sleep duration, living arrangements, China, panel analysis

Introduction

Living arrangements among Chinese older adults have changed over the years with the aging of the overall population and decline in fertility (Lei, Strauss, Tian, & Zhao, 2015). Lack of a strong government support system like the social security system in the United States has left much of the responsibility of taking care of the older adults from a financial point of view to their families, especially in rural areas (Lei et al., 2015). Those living alone compared with living with family members such as children, despite lower activities of daily living (ADLs) disability, also self-rated their health more poorly and men in particular had increased mortality risks, compared with their counterparts with living arrangements that included their children (Li, Zhang, & Liang, 2009). Among older Chinese women, there was an association between living alone and depression (Chou, Ho, & Chi, 2006). Henceforth, living arrangement could be an important factor associated with health among older adults in general.

In a study of people over the age of 80 years in China, two of the most significant predictors of life satisfaction were health and economic status (Ng, Tey, & Asadullah, 2017). In China, it is reasonable to infer that those who live alone and face financial difficulty likely have lower satisfaction with their lives, and they likely experience more stress than those who have higher satisfaction with life, given that older adults' loneliness is connected with lower income and never-married status in the United States (Anderson, 2010). A study by Feng, Falkingham, Liu, and Vlachantoni (2017) found differences in mortality based on living arrangements. For those who lived in institutions, or those moved into institutions after living with families, mortality was higher (Feng et al., 2017). Although traditional Chinese belief posits that family members should extend and provide care to older adults, this is no longer a long-term option for most Chinese to consider due to the rapid change in the Chinese social structure (Zhang & Goza, 2006). The disconnection between modern social structure and the traditional belief that family members should provide care to older adults has become challenges to Chinese society.

Other than living arrangements, Chinese older adults also suffer from increasing prevalence of sleep-related issues (Gu, Sautter, Pipkin, & Zeng,

2010). Sleep has been found to be associated with mortality, with both short and long sleep durations being predictors of death (Cappuccio, D'Elia, Strazzullo, & Miller, 2010). Among young adults, a robust association between loneliness and poor quality of sleep was observed (Matthews et al., 2017). A similar phenomenon is seen in the elderly population, with a study of Taiwanese older adults finding that social isolation has an adverse effect on quality of sleep (Yu, Steptoe, Niu, Ku, & Chen, 2018). With the gaps of knowledge, literature regarding living arrangements and sleep-related outcomes among older adults using a nationally representative study sample remains limited, in particular those residing in China.

Given the current living arrangements of many Chinese older adults due to the aforementioned environment that has been created, it is a topic worth exploring. With the association between social isolation and poorer sleep quality and the likelihoods of a suboptimal sleep pattern affecting mortality, the relationship between Chinese older adults' living arrangement and sleep-related outcomes should be examined. This relationship would suggest policy implications such as educating those in certain living arrangements that sleep hygiene indirectly is a risk factor for higher mortality. To address the research gap, we hypothesized that older adults' living arrangements are associated with sleep-related outcomes in China. Further practical implications are discussed.

Materials and Methods

Data Source

We extracted longitudinal panel data from the 2012 (collected between 2011 and 2012) and 2014 waves of the Chinese Longitudinal Healthy Longevity Survey (CLHLS). CLHLS was established by international collaborators at the Center for the Study of Aging and Human Development at Duke University (Zeng, Vaupel, Xiao, Liu, & Zhang, 2017). The study subjects of CLHLS include a wide range of topics including substance use (such as cigarette and alcohol uses), dietary behavior, mental health, cognitive function, social policy (such as social health insurance), disease status, and others. The surveyed region of CLHLS covers approximately 85% of the populations in major provinces and mega cities, targeting a substantial amount of centenarians, nonagenarians, and octogenarians, with randomly selected study participants. Investigators of CLHLS conducted face-to-face interviews for data collection. Informed consents were provided by the study participants. Reliability, validity, and consistency of CLHLS measurements were quite high, with good quality data (Gu, 2008). Refer to Zeng (2012) for further information. Because CLHLS is a secondary and deidentifiable data set in the public domain, institutional review board approval was not required for this research.

Measurements and Variables

This research had two outcome variables. The first outcome was a self-assessed measurement to determine whether the study participant had good quality of sleep (coded as good or not good; a dichotomous variable). We classified participants who reported good and very good quality of sleep as *good*. Those who reported neutral, bad, and very bad quality of sleep were categorized as *not good*. This categorization was based on two previous studies (Gu et al., 2010; Lee, Chang, Liu, & Shelley, 2019). Dichotomizing the sleep quality variable helps reduce the potential modeling complications related to a skewed distribution for the outcome variable, given that the majority of participants reported good quality of sleep based on raw data. The second outcome variable was older adults' average hours of sleep daily (a continuous variable, measured in hours). All sleep-related outcomes were self-reported by the participants through interviews with the CLHLS investigators.

The major predictor was older adults' living arrangements, classified into three categories (a categorical variable): lived alone, lived with household members (i.e., older adults' children or family relatives), and lived in an institution (i.e., nursing home).

We selected participants' age in years (categorized as 65–80, 81–95, and above 95; a categorical variable) and sex (male and female; a dichotomous variable) as biological determinants. Socioeconomic determinants in this research included marital status (married and others [including not married, divorced, or widowed]; a dichotomous variable), years of formal education (none, 1–5, 6–10, and above 10; a categorical variable), and household income. We categorized older adults' household income into six groups: first quintile (lower or equal to 10,000 RMB), second quintile (10,001–30,000 RMB), third quintile (30,001–50,000 RMB), fourth quintile (50,001–70,000 RMB), fifth quintile (higher than 70,001 RMB), and those who did not know their household income. We coded the household income as a categorical variable.

To provide participants' basic regional information, community of residence and geographical regions were selected as surrogate variables. Community of residence was categorized as urban or rural (a dichotomous variable). Geographical regions included major megacities and provinces in China (a categorical variable): (a) North: Beijing, Hebei, Shanxi, and Tianjin; (b) Northeast: Liaoning, Jilin, and Heilongjiang; (c) East: Shanghai, Jiangsu, Anhui, Zhejiang, Jiangxi, Fujian, and Shandong; (d) Central–South: Henan, Hunan, Hubei, Guangdong, Guangxi, and Hainan; and (e) West: Chongqing, Sichuan, and Shaanxi.

To describe older adults' physical and mental health status, we selected a total of five variables. Older adults' current exercise status assessed whether the participant was physically active (no and yes; a dichotomous variable). *Number*

of times suffering from chronic diseases that required inpatient treatments was selected to examine older adults' overall chronic condition (none, 1–2 times, and above 2 times; a categorical variable). The term *past two years* refers to the 2 years prior to when older adults' answered the questionnaire. Participants' life satisfaction was categorized into four groups: good, neutral, bad, and not able to answer (a categorical variable). To determine whether an older adult suffered from depression, we selected a question about whether they felt sad or blue (no, yes, and not able to answer; a categorical variable). Disability with ADLs examines older adults' disability status (not limited, strongly limited, and somewhat limited; a categorical variable). ADLs include bathing, dressing, eating, indoor transferring, toileting, and continence.

Statistical Analyses and Study Sample

A panel logistic regression model was employed to estimate older adults' quality of sleep, and a panel ordinary least squares (OLS) regression model was used to estimate participants' average hours of sleep daily. The panel analytic approach enables the researchers to examine changes in living arrangement over time by accounting for intraindividual variability, compared with the conventional cross-sectional study design (Hsiao, 2007). In addition to providing more robust conclusions, panel analysis heightens the capacity to account for the complexity of human behavior (Hsiao, 2007).

For statistical analyses, we used only unweighted measurements. Although sampling for the CLHLS data set is based on participants' age, sex, and community of residence (Gu et al., 2010), the sampling scheme does not include important compositional variables that could be used for data weighting. Under such circumstance, weighted regression could inflate standard errors (*SE*s; Gu et al., 2010), making the regression estimates less accurate.

To perform longitudinal panel analyses, we selected a total of 6,009 older adults aged 65 years and above who answered survey questions on two different occasions—the 2012 and 2014 rounds of survey. Participants who responded to only one of the surveys or had missing information were excluded, with a total of 5,552 and 5,077 participants retained in the 2012 and 2014 waves, respectively. To avoid extreme values, permanently bedridden individuals were also deleted from the analyses. After we completed these steps, we merged two waves together with complete answers to questions of interests. The final study sample included 9,462 observations from a total of 4,731 participants, with 2,252 males and 2,479 females.

Adjusted odds ratios and 95% confidence intervals were reported for the panel logistic regression model. Standardized regression coefficients (β) and *SE*s were reported for the panel OLS regression model. All statistical interpretations were two-tailed using $p < .05$ to denote statistically significant results. We

used R (version 3.4.3) and its package "*pglm*" for all statistical analyses (Croissant, 2017). All statistical models were controlled for the aforementioned major predictor and sociodemographic covariates.

Results

Figure 1 shows the observed prevalence of good quality of sleep and average hours of sleep daily within different age groups among the older adults in the study sample. Table 1 provides the descriptive statistics of all selected variables in the final study sample based on 9,462 responses from 4,731 participants. Approximately 62% of older adults reported good quality of sleep (Table 1). The mean of average sleep period daily was around 7.60 hours with standard deviation 2.33. Most older adults lived with household members (80.7%), fewer than 2% lived in an institution, and approximately 18% lived alone. A majority of the participants were at least 80 years old and not married. Most older adults had household income less than the third quintile and had lower levels of education. Most participants resided in the East, Central, and South regions. More

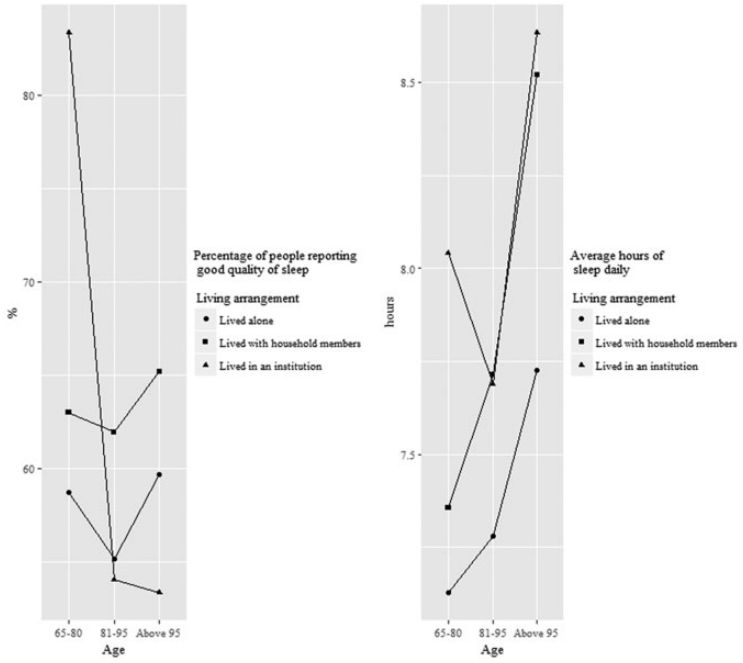

Figure 1. Observed prevalence of good quality of sleep and average hours of sleep daily within different age groups: Chinese Longitudinal Healthy Longevity Survey, 2012 to 2014.

Table 1. Descriptive Statistics of Variables in the Final Study Sample Based on 4,731 Participants (n = 9,462): Chinese Longitudinal Healthy Longevity Survey, 2012 to 2014.

	Quality of sleep	Quality of sleep	Overall
Variables	Not good ($n = 3,615$, 38.2%) *n* (%)	Good ($n = 5,847$, 61.8%) *n* (%)	($n = 9,462$) *n* (%)
Major predictors			
Living arrangements			
Lived alone	730 (20.2)	971 (16.6)	1,701 (18.0)
Lived with family members	2,833 (78.4)	4,800 (82.1)	7,633 (80.7)
Lived in an institution	52 (1.4)	76 (1.3)	128 (1.4)
Control variables			
Age (in years)			
65–80	1,577 (43.6)	2,614 (44.7)	4,191 (44.3)
81–95	1,563 (43.2)	2,382 (40.7)	3,945 (41.7)
Above 95	475 (13.1)	851 (14.6)	1,326 (14.0)
Sex			
Male	1,481 (41.0)	3,023 (51.7)	4,504 (47.6)
Female	2,134 (59.0)	2,824 (48.3)	4,958 (52.4)
Marital status			
Married	1,496 (41.4)	2,739 (46.8)	4,235 (44.8)
Others	2,119 (58.6)	3,108 (53.2)	5,227 (55.2)
Household income			
1	1,513 (41.9)	2,120 (36.3)	3,633 (38.4)
2	932 (25.8)	1,593 (27.2)	2,525 (26.7)
3	457 (12.6)	855 (14.6)	1,312 (13.9)
4	187 (5.2)	357 (6.1)	544 (5.7)
5	283 (7.8)	597 (10.2)	880 (9.3)
Do not know	243 (6.7)	325 (5.6)	568 (6.0)
Years of formal education received			
None	2,087 (57.7)	2,977 (50.9)	5,064 (53.5)
1–5	903 (25.0)	1,559 (26.7)	2,462 (26.0)
6–10	507 (14.0)	1,088 (18.6)	1,595 (16.9)
Above 11	118 (3.3)	223 (3.8)	341 (3.6)
Community of residence			
Urban	1,724 (47.7)	2,879 (49.2)	4,603 (48.6)
Rural	1,891 (52.3)	2,968 (50.8)	4,859 (51.4)
Geographical regions			
North	116 (3.2)	238 (4.1)	354 (3.7)
Northeast	179 (5.0)	351 (6.0)	530 (5.6)
East	1,171 (32.4)	2,501 (42.8)	3,672 (38.8)
Central or South	1,607 (44.5)	2,057 (35.2)	3,664 (38.7)
West	542 (15.0)	700 (12.0)	1,242 (13.1)

(continued)

Table 1. Continued.

Variables	Quality of sleep Not good ($n = 3,615$, 38.2%) *n* (%)	Quality of sleep Good ($n = 5,847$, 61.8%) *n* (%)	Overall ($n = 9,462$) *n* (%)
Exercise status			
No	2,473 (68.4)	3,684 (63.0)	6,157 (65.1)
Yes	1,142 (31.6)	2,163 (37.0)	3,305 (34.9)
Number of times suffering from chronic diseases that required inpatient treatments			
None	2,622 (72.5)	4,678 (80.0)	7,300 (77.2)
1–2	825 (22.8)	1,033 (17.7)	1,858 (19.6)
Above 2	168 (4.6)	136 (2.3)	304 (3.2)
Life satisfaction			
Good	1,873 (51.8)	3,981 (68.1)	5,854 (61.9)
Neutral	1,356 (37.5)	1,521 (26.0)	2,877 (30.4)
Bad	263 (7.3)	135 (2.3)	398 (4.2)
Not able to answer	123 (3.4)	210 (3.6)	333 (3.5)
Depression			
No	2,448 (67.7)	4,720 (80.7)	7,168 (75.8)
Yes	661 (18.3)	506 (8.7)	1,167 (12.3)
Not able to answer	506 (14.0)	621 (10.6)	1,127 (11.9)
Disability with activity of daily living			
Not limited	2,181 (60.3)	4,300 (73.5)	6,481 (68.5)
Strongly limited	443 (12.3)	437 (7.5)	880 (9.3)
Somewhat limited	991 (27.4)	1,110 (19.0)	2,101 (22.2)

Note. Mean of participants' average daily hours of sleep: 7.60 hours (standard deviation: 2.33).

than 60% of older adults did not exercise. Most older adults did not suffer from chronic conditions in the last 2 years, did not report depression-related symptoms, and did not have ADL disability. More than 60% of participants reported good quality of life (Table 1).

Table 2 provides the results of panel logistic and OLS regression models. Older adults who lived with household members had 17% greater odds of reporting good quality of sleep (adjusted odds ratios = 1.17, 95% confidence interval [1.03, 1.34], $p < .05$), compared with older adults who lived alone. Living in an institution was not associated with quality of sleep, although we also found higher odds of living in an institution and better quality of sleep, compared with older adults living alone. Participants who lived with household members ($\beta = .334$, $SE = .069$, $p < .01$) and lived in an institution ($\beta = .430$, $SE = .211$, $p < .05$) reported longer sleep durations than those who lived alone.

Table 2. Panel Regression Models Examining the Associations Between Living Arrangements and Quality of Sleep and Between Living Arrangement and Daily Hours of Sleep: Chinese Longitudinal Healthy Longevity Survey, 2012 to 2014.

	Model 1: Quality of sleep (panel logistic regression) AOR [95% CI]	Model 2: Daily hours of sleep (panel OLS regression) β, *SE*
Major predictors		
Living arrangements		
Lived alone	—[a,b]	—[a]
Lived with family members	1.17 [1.03, 1.34]*	.334, .069**
Lived in an institution	1.15 [0.77, 1.73]	.430, .211*
Control variables		
Age (in years)		
65–80	—	—
81–95	1.02 [0.91, 1.13]	.182, .055**
Above 95	1.37 [1.16, 1.61]**	.828, .084**
Sex		
Male	—	—
Female	0.68 [0.61, 0.76]**	−.415, .055**
Marital status		
Married	—	—
Others	0.97 [0.87, 1.09]	.233, .059**
Household income		
1	—	—
2	1.10 [0.98, 1.24]	.156, .062*
3	1.14 [0.98, 1.33]	.147, .078
4	1.12 [0.91, 1.39]	.140, .109
5	1.12 [0.94, 1.34]	.330, .091**
Do not know	1.08 [0.89, 1.32]	.148, .104
Years of formal education received		
None	—	—
1–5	1.03 [0.91, 1.16]	.039, .062
6–10	1.14 [0.99, 1.32]	−.046, .075
Above 11	0.84 [0.64, 1.09]	−.466, .136**
Community of residence		
Urban	—	—
Rural	1.02 [0.93, 1.13]	−.025, .050
Geographical regions		
North	—	—
Northeast	1.04 [0.76, 1.43]	−.277, .160
East	1.15 [0.89, 1.49]	−.352, .131**
Central or South	0.68 [0.53, 0.89]**	−.465, .132**
West	0.69 [0.53, 0.92]**	−.455, .141**

(continued)

Table 2. Continued.

	Model 1: Quality of sleep (panel logistic regression) AOR [95% CI]	Model 2: Daily hours of sleep (panel OLS regression) β, *SE*
Exercise status		
No	—	—
Yes	1.12 [1.01, 1.25]*	−.063, .053
Number of times suffering from chronic diseases that required inpatient treatments		
None	—	—
1–2	0.80 [0.71, 0.90]**	−.083, .060
Above 2	0.57 [0.44, 0.73]**	−.437, .135**
Life satisfaction		
Good	—	—
Neutral	0.60 [0.55, 0.67]**	−.242, .054**
Bad	0.36 [0.28, 0.46]**	−.706, .123**
Not able to answer	1.32 [0.99, 1.75]	.602, .150**
Depression		
No	—	—
Yes	0.55 [0.47, 0.63]**	−.373, .075**
Not able to answer	0.68 [0.58, 0.80]**	.075, .086
Disability with activity of daily living		
Not limited	—	—
Strongly limited	0.60 [0.50, 0.70]**	.184, .087*
Somewhat limited	0.65 [0.58, 0.73]**	.002, .060

Note. *SE* = standard error; CI = confidence interval; OLS = ordinary least squares; AOR = adjusted odds ratio.
[a]Reference level (—).
[b]Reference level of panel logistic regression = 1.00.
*$p < .05$. **$p < .01$.

Discussion

This research investigated Chinese older adults' living arrangements and sleeping patterns using a panel analysis with a large nationally representative sample, CLHLS. Model results demonstrated that older adults' living arrangements were associated with quality of sleep and average sleep duration daily. In general, older adults who lived with household members reported better quality of sleep and had longer sleep duration, compared with those who lived alone. Older adults who lived in an institution also had longer sleep duration daily than participants who lived alone, but this significant association was not observed for quality of sleep. In previous research, sleep quality and sleep duration are equally important predictors of human health (Bin, 2016; Knutson, Ryden, Mander, & Van Cauter, 2006). In this research, the results of living

with family members were all significantly and consistently associated with both sleep-related measurements. Therefore, living with family members might be a critical arrangement that helps older adults in general.

Our research findings regarding the association of living with household members and better quality of sleep among older adults are consistent with previous regional findings that older adults who lived alone had a greater chance of poor sleep quality in Shanghai (Luo et al., 2013). We also observed that lower life satisfaction or depression among older adults was associated with lower odds of good quality of sleep. Similarly, a literature review by Thapa, Visentin, Kornhaber, and Cleary (2018) concluded that older adults, who were left behind when their children migrated, experienced more problems related to depression and psychological health as compared to older adults who did not have migrant children. This pattern could be stronger in China, a country with strong emphasis on filial piety, a traditional belief of family care of older adults (Benjamin, Brandt, & Rozelle, 2000) to help ensure continuation of the *family tree* (Teon, 2016).

Family bonding plays a key role in Chinese society, and family relationship and well-being could be enhanced through multigenerational living along with the associations of sleeping patterns found in this research. It is imperative to maintain family bonding among older adults, given that mental health and sleep go hand in hand in the elderly population (Reid et al., 2006). With rapid changes in Chinese society, living with family members is not the only option to practice filial piety (Silverstein, Cong, & Li, 2006), but this living arrangement could be associated with better sleep among older adults. Further health promotional strategies should continue to strengthen the role of family relationship and related health outcomes such as sleeping patterns among Chinese older adults.

The importance of older adults' living arrangements can also be found in other areas, in which case our study supplements the body of literature providing the evidence and importance of living with family members among Chinese older adults. Feng et al. (2017) found that living in an institution is associated with higher mortality rates for Chinese older adults, but living with family members is not associated with a dramatically increased mortality risk. In the same vein, living with family members is positively associated with life satisfaction among Chinese older adults (Ng et al., 2017; Sereny, 2006). A similar observation of living with household members and better life satisfaction has been found in the older adult population in Malaysia (Kooshiar, Yahaya, Hamid, Abu Samah, & Sedaghat Jou, 2012), another dynamic developing country with rapid urbanization.

Our study provides practical implications for further health promotion, given that sleep is an important resting behavior to improve well-being and human health. The Chinese central government should continue to promote the importance of living with family members and its effect on related health consequences including better sleep. Although living with family members is associated with

better health, higher life satisfaction, and better sleep, Chinese families and older adults should also pay attention to other social issues, especially for older adults living alone.

In fact, the proportion of older adults living alone is increasing consistently (Lei et al., 2015). However, China does not have a robust public social security system for supporting older adults (Lei et al., 2015). Large social disparity still persists in the Chinese welfare system such as the public insurance plans or health-care utilization (Lee, Chiang, Shelley, & Liu, 2018; Yu, 2015). When family members do not live with older adults, the older adults may not have sufficient financial resources and related welfare to maintain good quality of life. In one case, preventative care utilization is strongly associated with better life satisfaction among Chinese older adults (Lee, Chang, & Liu, 2019), but household income is a strong factor accounting to the preventative care utilization in general (Liu et al., 2016). Accordingly, the Chinese central government should promote living arrangements with family members or residential support from family. Even with a relatively weak social system, the benefits of living with family members might reduce such concerns and decrease the burden of disease.

This research has several strengths, including a nationally representative sample and a panel analytic approach for studying older adults' sleeping behavior in two dimensions. However, we should point out several study limitations. The sleep-related measurements in this research all were self-reported. The CLHLS investigators did not use sleep-related instruments, such as The Pittsburgh Sleep Quality Index, to assess older adults' sleeping patterns. The self-reported measurements could induce bias. However, self-reported bias is a common limitation for most survey-based research. In fact, the previous literature has shown consistency between self-reported health outcomes and objective health conditions (Wu et al., 2013). In this case, the self-reported outcomes should provide sufficient information of participants' quality of sleep and its duration. Furthermore, as the CLHLS data provide only basic information regarding older adults' sleep, the CLHLS questionnaire did not ask about participants' sleep-related problems such as insomnia or hypersomnia. Further research should attempt to resolve such limitations by studying sleep-related diseases.

On the other hand, our target population of this research was Chinese older adults, so we should be careful not to generalize our study findings to Western countries due to traditional Chinese characteristics of filial piety. In addition, a previous study has found positive associations between living with family members and life satisfaction among Malaysian older adults (Kooshiar et al., 2012). If this is unique to Eastern culture, we may generalize our research findings to other Asian countries. Further research is warranted to investigate similar topics of interest in the Western world. Finally, as the number of older adults living in an institution was relatively small in the study sample, we should be careful not to make a conclusive claim regarding this matter. Other investigators with

similar research interests should examine the sleeping patterns among older adults who resided in institutions.

Conclusion

This research adds to the body of literature in the study of sleep by investigating the associations of older adults' living arrangements with quality of sleep and average hours of sleep daily. Older adults who lived with family members had higher odds of reporting better quality of sleep and longer sleeping duration. The family bonding through living arrangements could help increase the odds of better quality of sleep among older adults. When older adults live with family members, family relationships can be enhanced and older adults could enjoy higher life satisfaction, in turn improving the quality of sleep. The Chinese central government has planned to launch reforms to promote healthier lifestyles in China. With increasing sleep-related problems in modern China (Gu et al., 2010), it is imperative for public health practitioners and strategists to increase Chinese older adults' quality of sleep through appropriate family support.

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Ethical Approval

The authors used only secondary data sets for this study and data analyses. Thus, approvals from Institutional Review Board were not required.

Declaration of Conflicting Interests

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Article

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Grandchildren's Perceptions of Grandparents' Use of Relational Maintenance Behaviors

Daniel H. Mansson[1]

Abstract

The purposes of this study were to examine (a) grandchildren's perceptions of the extent to which their grandparents' use relational maintenance behaviors; (b) grandchildren's perceived differences in grandparents' use of relational maintenance behaviors as functions of grandparent sex, grandchild sex, and grandparent–grandchild (GP-GC) family lineage; and (c) the relationships between grandchildren's perceptions of their grandparents' use of relational maintenance behaviors and the grandchildren's self-reported GP-GC relational characteristics. Young adult grandchildren ($N = 209$) completed a questionnaire in reference to a specific GP-GC relationship. Descriptive statistics indicated that grandparents use the seven relational maintenance behaviors (i.e., advice, assurances, conflict management, networks, openness, positivity, and tasks) to different degrees. However, the multivariate analyses of variance did not indicate any significant effects for grandparent and grandchild sex or GP-GC family lineage on perceived grandparental use of relational maintenance behaviors. Conversely, Pearson correlations provided support for the hypothesized positive relationships between grandchildren's perceptions of their grandparents' use of relational maintenance behaviors and the grandchildren's self-reported GP-GC relational characteristics.

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grandparents, grandchildren, relational maintenance, biological sex, family lineage, communication satisfaction, liking, relational satisfaction

The grandparent–grandchild (GP-GC) relationship is an enduring (J. E. Soliz, Lin, Anderson, & Harwood, 2006), emotionally close (Harwood, 2000), supportive (J. Soliz, 2008), and trusting (Kennedy, 1990) relationship that benefits grandparents and grandchildren alike (Ruiz & Silverstein, 2007). As people grow older and become grandparents, their social networks tend to shrink and familial bonds are therefore imperative to grandparents (Harwood, 2018). For instance, grandparents experience a sense of pride in their grandchildren and find the mutual GP-GC affection the most rewarding aspect of being grandparents; however, they also value seeing their grandchildren mature, learning from their grandchildren, and engaging in shared GP-GC activities, such as playing sports, games, and cooking together (Mansson, 2016b). Grandparents who engage in frequent, positive interactions with their grandchildren increase their chances of being cared for by their grandchildren in the future, which enables grandparents to manage their declining health more effectively (Harwood, 2018; Mansson, 2018); they also tend to be physiologically (Hughes, Waite, LaPierre, & Luo, 2007) and psychologically healthy (Mansson, 2014a). Thus, grandparents often perceive their grandchildren as an important emotional resource (Silverstein, Giarrusso, & Bengtson, 2003) as being a grandparent is a joyous experience (Sherins & Holleman, 1995) that positively influences grandparents' life satisfaction (Powdthavee, 2011).

Similarly, grandchildren involved in positive GP-GC relationships have been found to limit their use of illicit drugs and other risk-taking behaviors (Kennison & Ponce-Garcia, 2012), along with experiencing fewer general conduct problems, such as school and relational problems (Griggs, Tan, Buchanan, Attar-Schwartz, & Flouri, 2010). Grandparents also teach their grandchildren about the family history (Brussoni & Boon, 1998) while positively influencing their grandchildren's financial (Kennedy, 1990) and psychological well-being (Mansson, 2013b), attitudes toward older people (Harwood, 2018), school (Brussoni & Boon, 1998), family identity (Soliz & Harwood, 2006), and the prospect of developing other close dyadic relationships that may benefit the grandchildren (Mansson & Booth-Butterfield, 2011; O'Neil & Klein, 2008). Thus, it is no surprise that, followed by the parent–child relationship, the GP-GC relationship is the second most important relationship in which children are involved (Kornhaber, 1985). However, in order to enjoy these mutual relational benefits, grandparents and grandchildren alike need to engage in relational maintenance behaviors.

Although scholars have devoted some attention to examining how grandchildren maintain their GP-GC relationships (e.g., Mansson, Myers, & Turner, 2010), research on grandparents' use of relational maintenance behaviors with their grandchildren remain scant. Therefore, the purposes of this study are to examine (a) grandchildren's perceptions of the extent to which their grandparents' use relational maintenance behaviors; (b) grandchildren's perceived differences in grandparents' use of relational maintenance behaviors as functions of grandparent sex, grandchild sex, and GP-GC family lineage; and (c) the relationships between grandchildren's perceptions of their grandparents' use of relational maintenance behaviors and the grandchildren's self-reported GP-GC relational characteristics.

Review of Literature and Rationale

Relational maintenance behaviors, which are defined as "communication messages and behaviors used to preserve an acceptable and lasting relational state" (Waldron, 1991, p. 289), are used both strategically and routinely (Stafford, Dainton, & Haas, 2000) to keep relationships in existence, in a specified condition, in a satisfactory condition, and in repair (Dindia & Canary, 1993). To achieve these goals, relational partners use a variety of relational maintenance behaviors, which are advice, assurances, conflict management, networks, openness, positivity, and tasks (Stafford & Canary, 1991; Stafford et al., 2000). *Advice* involves providing relational partners with social support, such as offering opinions and suggestions, and *assurances* centers on expressed commitment and willingness to remain in the relationship. *Conflict management* refers to resolving conflicts in a patient and considerate manner, and *networks* refers to shared friends and familial groups in which both relational partners are involved. *Openness* involves overt and direct discussions about the relationship, and *positivity* deals with optimistic and cheerful communication with a relational partner. Finally, *tasks* refers to the daily responsibilities and chores relational partners face (Stafford & Canary, 1991; Stafford et al., 2000).

The use of relational maintenance behaviors is one of the most heuristic areas of interpersonal and family communication research during the past four decades. In general, scholars have initiated their studies by examining the extent to which relational maintenance behaviors are enacted in specific relational contexts, sex differences in enacted and received relational maintenance behaviors, and the interplay between relational maintenance behaviors and relational characteristics. Specifically, these studies have been conducted in the context of friendships, romantic relationships, parent–child relationships, sibling relationships, and, to a lesser extent, GP-GC relationships (e.g., Mansson et al., 2010; Myers & Glover, 2007; Myers et al., 2001; Oswald, Clark, & Kelly, 2004; Stafford & Canary, 1991; Stafford et al., 2000). However, the approach to relational maintenance studies differs in that scholars have relied on self-reports

(i.e., participants' own use of relational maintenance behaviors), other reports (i.e., participants' perceptions of their relational partners' use of relational maintenance behaviors), self- and other reports, and dyadic data (i.e., paired self- and other reports; e.g., Goodboy, Dainton, Borzea, & Goldman, 2017; Kissick Buoy & Yum, 2007; Myers & Glover, 2007). This study is based on other reports in that grandchildren's perceptions of their grandparents' use of relational maintenance behaviors are examined.

Previous GP-GC relational maintenance studies indicate that grandchildren actively maintain their GP-GC relationships when they like and feel emotionally close to their grandparents, are both communicatively and relationally satisfied, committed to their GP-GC relationships, and believe there is an acceptable GP-GC relationship control mutuality (Mansson, 2016a). Grandchildren also maintain their GP-GC relationships with trustworthy, affectionate (Mansson, 2014b), and emotionally supportive (Mansson et al., 2010) grandparents. However, given the mutually beneficial nature of the GP-GC relationship, it seems likely that not only grandchildren, but also grandparents sustain their GP-GC relationships.

Despite the absence of research that specifically focuses on grandparents' use of relational maintenance behaviors with their grandchildren, scholars have identified a series of grandparental behaviors that reflect relational maintenance behaviors, although not overtly conceptualized as such. For instance, early work by Eisenberg (1988) indicates that most grandparents (some variations exist as functions of grandparent sex and family lineage) offer their grandchildren advice, participate in family gatherings and vacations, share secrets with their grandchildren, and make their grandchildren feel good. Other grandparent behaviors that reflect relational maintenance behaviors include providing guidance (Kennedy, 1990) and emotional support (Soliz, 2008), cooking and cleaning together (Mansson, 2016b), talking about their family (Lin, Harwood, & Bonnesen, 2002), discussing important personal issues, dining out, attending religious ceremonies and school events together (Block, 2000), expressing pride in their grandchildren, discussing the future (Harwood & Lin, 2000), conveying love for grandchildren (Kennedy, 1990), resolving conflicts (Cherlin & Furstenberg, 1986), and self-disclosing (Barker, 2007; Soliz, 2007). Collectively, these grandparental behaviors reflect relational maintenance behaviors in the forms of advice, assurances, conflict management, networks, openness, positivity, and tasks (see aforementioned conceptualizations of the different relational maintenance behaviors), which may contribute to grandchildren's beliefs that it is primarily the grandparents' responsibility to sustain their GP-GC relationships (Kennedy, 1990). As with all relational maintenance behaviors, these grandparent behaviors require contact between grandparents and grandchildren, making interaction initiation and frequency critical components of the GP-GC relationship.

Block (2000) reported that grandparents often initiate contact with their grandchildren by calling or in-person visits. Similar results were found by Holladay and Seipke (2007) who concluded that grandparents often initiate contact with their geographically distant grandchildren, in particular via telephone and e-mail, suggesting that grandparents indeed try to maintain their GP-GC relationships. Extending this line of inquiry by examining grandchildren's perceptions of the degree to which their grandparents enact specific types of relational maintenance behaviors will not only enhance our understanding of how this mutually beneficial, intergenerational relationship is maintained but also serve as a foundation for future GP-GC relational maintenance studies as the effects relational maintenance behaviors have on both positive and negative relational outcomes vary (see Dainton & Myers' [in press] book for a review). To explore this idea, the following research question is posed:

> **Research Question 1 (RQ1):** From the perspective of grandchildren, to what extent do grandparents use advice, assurances, conflict management, networks, openness, positivity, and tasks relational maintenance behaviors to sustain their GP-GC relationships?

After exploring the extent to which relational maintenance behaviors are used (or perceptions thereof), researchers generally have examined relational maintenance behaviors as functions of both relational partners' sex, and how relational maintenance behaviors are associated with both the actors' and their relational partners' relational characteristics. Relational maintenance studies in which biological sex has been examined are plentiful and they have yielded somewhat mixed results. Because detailing the results of all those studies is beyond the scope of this investigation, the readers are referred to Ogolsky and Bowers's (2013) meta-analysis of 35 studies. The authors concluded that, compared with men, women both enact and receive relational maintenance behaviors somewhat more frequently.

Examining sex differences in the GP-GC relationship may be of particular importance because most grandparents are grandmothers, and grandchildren reportedly feel closer to their grandmothers than to their grandfathers (Hoffman, 1979–1980). Moreover, Eisenberg (1988) reported that grandchildren like their grandmothers more than they like their grandfathers; she also concluded that, compared with grandfathers, "grandmothers have more contact with grandchildren and engage in more positive activities with them [the grandchildren] than do grandfathers" (p. 214). Similarly, grandchildren report greater feelings of being understood, communication quality, and involvement in shared activities with grandmothers compared with grandfathers, which may explain why grandchildren also perceive their grandmothers to have the most positive influence on their values (Roberto & Stroes, 1992). In a more recent study, grandchildren were found to receive more nonverbal affection from their

grandmothers compared with their grandfathers (Mansson & Booth-Butterfield, 2011). Thus, to corroborate and extend extant GP-GC and relational maintenance research, it was hypothesized that:

Hypothesis 1a (H1a): Grandchildren will report that, compared with grandfathers, grandmothers will be perceived to use relational maintenance behaviors more frequently to sustain their GP-GC relationships compared with grandfathers.

Hypothesis 1b (H1b): Compared with grandsons, granddaughters will report that their grandparents use relational maintenance behaviors more frequently to sustain their GP-GC relationships.

Hypothesis 1c (H1c): There is a significant interaction effect of grandparent and grandchild sex on grandchildren's reports of their grandparents use of relational maintenance behaviors to sustain their GP-GC relationships.

Researchers also have examined the effects of family lineage on the GP-GC relationship. However, these studies have yielded somewhat mixed results. According to Kin Selection Theory (KST), "grandparents will differentially invest in their grandchildren as a function of paternity certainty" (Bishop, Meyer, Schmidt, & Gray, 2009, p. 66). As such, the strongest GP-GC link is believed to exist between maternal grandmothers and their grandchildren (i.e., no uncertainty link), followed by both maternal grandfathers' and paternal grandmothers' relationships with their grandchildren (i.e., one uncertainty link), and finally the weakest GP-GC bond is believed to exist between paternal grandfathers and their grandchildren (i.e., two uncertainty links). Bishop et al. (2009) found support for KST in that grandchildren reported the greatest closeness and interaction frequency with their maternal grandmothers, moderate closeness and interaction frequency with maternal grandfathers and paternal grandmothers, and lowest closeness and interaction frequency with paternal grandfathers. These results mirror parts of Eisenberg's (1988) findings who reported that grandchildren like maternal grandmothers the most and they like paternal grandfathers the least. However, when testing this idea in a GP-GC affectionate communication study, Mansson (2013c) found mixed results in that grandchildren reportedly receive more love and esteem affection from their maternal grandmothers compared with their maternal grandfathers, but grandchildren reportedly receive more memories and humor affection from their maternal grandfathers compared with both their maternal and paternal grandmothers. Similarly, grandchildren most often perceive their grandfathers as a role model (i.e., a person to emulate), and grandmothers are more likely than grandfathers to make the grandchildren feel bad (Eisenberg, 1988). Collectively, these findings suggest that KST's utility varies across different

types of communicative behaviors, which prompted the following research question:

> **Research Question 2 (RQ2):** From the perspective of grandchildren, to what extent does GP-GC family lineage affect grandparents' use of relational maintenance behaviors to sustain their GP-GC relationships?

Relational characteristics are features of dyadic relationships that influence individuals' relationship perceptions and willingness to sustain their relationships (Stafford et al., 2000). Although relational characteristics can be both positive (e.g., Stafford & Canary, 1991) and negative (e.g., Sidelinger & Booth-Butterfield, 2009), the most commonly studied relational characteristics applicable to the GP-GC relationship and grandparents' communicative behaviors are positive and include communication satisfaction, liking, and relationship satisfaction (Bengtson, Giarrusso, Mabry, & Silverstein, 2002; Harwood, 2000; Mansson, 2013a, 2013d). These relational characteristics reflect GP-GC relational solidarity, which Silverstein, Giarrusso, and Bengtson (1998) argued is the most important aspect of the GP-GC relationship.

Communication satisfaction is defined as the positive evaluations and affect associated with communicative events that are enjoyable, flow well, and meet the conversationalists' expectations (Harwood, 2000; Hecht, 1978). *Liking* refers to the degree to which individuals admire their relational partners and includes both positive affect and respect (Rubin, 1970). Finally, *relationship satisfaction* is defined as individuals' general contentment with their relationships (Canary & Spitzberg, 1989). These, and in some cases additional relational characteristics, have been studied as components of relational solidarity in the GP-GC relationship (e.g., Mansson, 2013d). Scholars have argued that, although these relational characteristics are essential for the sustainment of dyadic relationships (Stafford et al., 2000), they may be of particular importance to the GP-GC relationship (Silverstein et al., 1998). In the United States, there is an unfortunate bias against older people (Soliz et al., 2006) and younger people's intergenerational interactions outside the family are relatively infrequent (Ng, Lui, Weatherall, & Loong, 1997) . However, if grandchildren's favorable perceptions of their grandparents and their GP-GC relationships can be linked to grandparents' communicative behaviors, it is possible that grandparents also have the ability to positively influence young adults' general attitudes toward older people (Silverstein & Parrott, 1997).

Communication satisfaction, partner liking, and communication satisfaction have been associated positively with the use of relational maintenance behaviors across a plethora of relational contexts (e.g., Canary, Stafford, & Semic, 2002; Myers et al., 2001; Stafford & Canary, 1991, 2006), with assurances and positivity generally being most closely associated with these positive relational outcomes (see Dainton & Meyers' [in press] book for a review). However, scholars

have yet to examine how perceived grandparental use of relational maintenance behaviors is associated with grandchildren's GP-GC relational characteristics. To date, these favorable relational characteristics have been associated positively with a host of grandparental communication attributes and behaviors. In general, grandchildren report elevated GP-GC communication satisfaction, relational satisfaction, and grandparent liking when their grandparents express affection (Mansson, 2013a, 2013d), accommodate their communication styles appropriately and effectively manage GP-GC conversation topics while conversing with their grandchildren (Harwood, 2000), self-disclose (Downs, 1988), and engage in identity-confirming and supportive communication (Soliz, Thorson, & Rittenour, 2009) with their grandchildren. Thus, considering the associations between these prosocial grandparental communication behaviors and grandchildren's perceived GP-GC relational characteristics coupled with extant relational maintenance research referenced earlier, it stands to reason that similar relationships also exist between perceived grandparental use of relational maintenance behaviors and grandchildren's perceptions of their grandparents and their GP-GC relationships. Consequently, the following hypothesis was forwarded:

> **Hypothesis 2 (H2):** From the perspective of grandchildren, grandparents' use of relational maintenance behaviors will be related positively to the grandchildren's self-reported GP-GC relational characteristics (i.e., communication satisfaction, liking, and relational satisfaction).

Methods

Participants

Young adult male ($n = 105$) and female ($n = 104$) grandchildren ($M_{age} = 19.68$, $SD = 1.41$, range = 18–25 years) enrolled in several introductory and upper-level administration of justice, English, mathematics, and rehabilitation and human services courses at a small, public university in northeastern United States participated in this study. Most of the participants were sophomores (49.5%), followed by freshmen (26.0%), juniors (17.8%), and seniors (6.7%) who self-identified as African Americans (8.0%), Asian Americans (3.0%), Caucasian Americans (67.2%), Hispanic or Latino Americans (17.4%), Native Americans (.5%), and other (4.0%). A review of the United States Census Bureau's (2014) data indicates that the ethnic composition of this sample reflects the U.S. population.

Procedures and Instruments

After securing approval for human subjects research from the university's research compliance office, the participants were recruited during regular class time. Two qualifications had to be met for participation in this study: being 18 to 25 years old and having at least one living biological grandparent. Students who met these criteria and elected to participate completed a three-part questionnaire. Part 1 of the questionnaire contained the participant demographics summarized earlier. Part 2 focused on their target grandparents' demographics (detailed later). To ensure the participants did not simply select their favorite grandparents, they were instructed to:

> Think about the biological grandparent whose birthday is closest to your own and then complete the following questions in reference to that specific grandparent. If you do not know your grandparents' birthdays, think about the biological grandparent with whom you most recently communicated and then complete the following questions in reference to that specific grandparent (Mansson, 2013d).

The target grandparents ($M_{age} = 74.74$, $SD = 8.41$, range = 56–96 years) on whom the participants reported were maternal grandmothers (44.9%), maternal grandfathers (16.1%), paternal grandmothers (12.7%), and paternal grandfathers (26.3%) with whom the grandchildren interacted, on average 36 times (i.e., twice a week) per academic semester ($SD = 41.84$, range = 0–125). Finally, Part 3 of the questionnaire consisted of the Relational Maintenance Behaviors Scale (RMBS) (Stafford et al., 2000), the Communication Satisfaction Scale (Lin & Harwood, 2003), the Liking Scale (Frymier, 1994), and the Relational Satisfaction Scale (Canary & Spitzberg, 1989) along with four other instruments not included in the current investigation, which are utilized in a different study. When needed, the measurement items were reworded slightly to accurately portray the GP-GC relationship. Specifically, the item target words "my partner" were replaced with "my grandparent."

The Relational Maintenance Behaviors Scale. The RMBS consists of 31 items that measure the respondents' self-reported use of seven relational maintenance behaviors (i.e., advice [two items], assurances [eight items], conflict management [five items], networks [two items], openness [seven items], positivity [two items], and tasks [five items]) with their relational partners. In this study, the RMBS was used as an other report measure in that grandchildren reported their perceptions of their grandparents' use of relational maintenance behaviors to sustain their GP-GC relationships. Modified sample items are: "My grandparent tells me how much I mean to her/him," and "My grandparent tells me how

he/she feels about our relationship." Responses were solicited on a seven-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The Cronbach's αs were .87 (item $M = 5.48$, $SD = 1.62$) for advice, .94 (item $M = 5.03$, $SD = 1.59$) for assurances, .93 (item $M = 5.28$, $SD = 1.67$) for conflict management, .85 (item $M = 5.70$, $SD = 1.58$) for networks, .93 (item $M = 3.87$, $SD = 1.66$) for openness, .89 (item $M = 5.77$, $SD = 1.59$) for positivity, and .94 (item $M = 5.34$, $SD = 1.67$) for tasks.

The Communication Satisfaction Scale. The Communication Satisfaction Scale consists of five items that Lin and Harwood (2003) adapted from Hecht's (1978) Interpersonal Communication Satisfaction Inventory in order to measure grandchildren's satisfaction with their GP-GC conversations. Responses were solicited on a seven-point Likert-type scale ranging from 1 (*strongly disagre*e) to 7 (*strongly agree*). Sample items are: "I am generally dissatisfied with the conversations I have with my grandparent" (reverse coded) and "My conversations with my grandparent flow smoothly." The Cronbach's α was .90 (item $M = 5.70$, $SD = 1.36$).

The Liking Scale. The Liking Scale consists of 10 items that measure the extent to which the respondents like their relational partners. Responses were solicited on a seven-point semantic differential scale. Sample bipolar adjective pairs are: "Likable-Dislikable" and "Kind-Unkind." The Cronbach's α was .95 (item $M = 6.03$, $SD = 1.96$).

The Relational Satisfaction Scale. The Relational Satisfaction Scale consists of three items that measure the respondents' perceived relationship satisfaction. Responses were solicited on a seven-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Sample items are: "I am satisfied with my relationship with my grandparent" and "My relationship with my grandparent is rewarding." The Cronbach's α was .85 (item $M = 6.03$, $SD = 1.33$).

Results

This study was conducted to explore two research questions and to test two hypotheses.

The first research question posed was: From the perspective of grandchildren, to what extent do grandparents use advice, assurances, conflict management, networks, openness, positivity, and tasks relational maintenance behaviors to sustain their GP-GC relationships? Grandchildren reported that their grandparents rely most heavily on positivity (item $M = 5.77$, $SD = 1.59$), followed by networks (item $M = 5.70$, $SD = 1.58$), advice (item $M = 5.48$, $SD = 1.62$), tasks (item $M = 5.34$, $SD = 1.67$), conflict management (item $M = 5.28$, $SD = 1.67$), assurances (item $M = 5.03$, $SD = 1.59$), and openness (item

$M = 3.87$, $SD = 1.66$) relational maintenance behaviors to sustain their GP-GC relationships.

The first hypothesis, which was divided into three parts, posited that, grandchildren would report that, compared with grandfathers, grandmothers are perceived to use relational maintenance behaviors more frequently to sustain their GP-GC relationships (H1a), compared with grandsons, granddaughters would report that their grandparents use relational maintenance behaviors more frequently to sustain their GP-GC relationships (H1b), and there is a significant interaction effect of grandparent and grandchild sex on grandchildren's reports of their grandparents use of relational maintenance behaviors to sustain their GP-GC relationships (H1c).

These three subhypotheses were tested using a 2×2 MANOVA in which grandparents' sex (coded 1 = grandmothers and 2 = grandfathers) and grandchildren's sex (coded 1 = granddaughters and 2 = grandsons) were entered as the independent variables and the seven relational maintenance behaviors were entered as the dependent variables. The MANOVA did not reveal any significant main effects for grandparents' sex, *Wilks's* $\Lambda = .97$, $F(7, 186) = .72$, $p = .65$, $\eta^2 = .03$, power = .31, or grandchildren's sex *Wilks's* $\Lambda = .96$, $F(7, 86) = 1.26$, $p = .27$, $\eta^2 = .05$, power = .53. Nor was a significant interaction effect found for grandparent and grandchild sex, *Wilks's* $\Lambda = .95$, $F(7, 186) = 1.36$, $p = .22$, $\eta^2 = .05$, power = .57. Thus, the three parts of the first hypothesis were not supported.

The second research question posed was: From the perspective of grandchildren, to what extent does GP-GC family lineage affect grandparents' use of relational maintenance behaviors to sustain their GP-GC relationships? This research question was explored using a MANOVA in which GP-GC family lineage (coded 1 = maternal grandmothers, 2 = maternal grandfathers, 3 = paternal grandmothers, and 4 = paternal grandfathers) was entered as the independent variable and the seven relational maintenance behaviors were entered as the dependent variables. The MANOVA did not reveal a significant model, *Wilks's* $\Lambda = .91$, $F(21, 535) = .88$, $p = .62$, $\eta^2 = .03$, power = .68.

The second hypothesis posited that grandchildren's perceptions of their grandparents' use of relational maintenance behaviors would be related positively to the grandchildren's self-reported GP-GC relational characteristics (i.e., communication satisfaction, liking, and relational satisfaction). As indicated in Table 1, significant positive relationships at $p. < .001$ (r range = .44 to .81) were found between the seven relational maintenance behaviors and the three relational characteristics. Thus, the second hypothesis was supported.

Discussion

The purposes of conducting this study were to examine (a) grandchildren's perceptions of the extent to which their grandparents' use relational

Table 1. Pearson Correlations Between Relational Maintenance Behaviors and Relational Characteristics.

	COSA	LIKE	RESA
1. Advice	.51	.44	.46
2. Assurances	.72	.68	.73
3. Conflict management	.75	.79	.75
4. Networks	.60	.65	.61
5. Openness	.54	.50	.53
6. Positivity	.76	.81	.73
7. Tasks	.74	.70	.77

Note. All correlations are significant at $p < .001$.
COSA = communication satisfaction; LIKE = liking; RESA = relational satisfaction.

maintenance behaviors; (b) grandchildren's perceived differences in grandparents' use of relational maintenance behaviors as functions of grandparent sex, grandchild sex, and GP-GC family lineage; and (c) the relationships between grandchildren's perceptions of their grandparents' use of relational maintenance behaviors and the grandchildren's self-reported GP-GC relational characteristics. Descriptive statistics indicated that grandchildren perceive their grandparents to rely most heavily on positivity, followed by networks, advice, tasks, conflict management, assurances, and openness relational maintenance behaviors to sustain their GP-GC relationships. However, the MANOVA did not yield any significant effects for grandparent sex, grandchild sex, or GP-GC family lineage on grandchildren's perceptions of their grandparents' use of relational maintenance behaviors, but significant, positive correlations were found between all relational maintenance behaviors and the three relational characteristics.

With the exception of openness, grandchildren reported that their grandparents use relational maintenance behaviors frequently (i.e., mean scores above 5.00 on a 7-point scale) to sustain their GP-GC relationships, which is encouraging because grandchildren believe the grandparenting role involves maintaining their GP-GC relationships (Kennedy, 1990). The grandchildren's reported grandparental use of relational maintenance behaviors also reflects grandchildren's perceptions of ideal grandparents. Grandchildren's primary expectation of their grandparents is that grandparents convey that they enjoy spending time with their grandchildren (Kennedy, 1990), which coincides with the finding that positivity is used most frequently by grandparents. Grandchildren also believe ideal grandparents are family oriented (Mansson, 2015), important members of the family (in particular the parent–child relationship) who should offer grandchildren advice and support (Kennedy, 1990; Soliz, 2008), which reflects the prevalence of networks and advice relational maintenance behaviors in this study. To a lesser degree, grandchildren believe their grandparents should

assist with tasks and resolve problems (Kennedy, 1990), which taps into the tasks and conflict management behaviors (Stafford et al., 2000). Moreover, both grandparents and grandchildren assume that grandchildren are an important part of the grandparents' future (Kennedy, 1990), which sheds some light on why assurances was deemphasized compared with positivity, networks, advice, tasks, and conflict management in this study. It also is possible that the ascribed nature and longevity of the GP-GC relationship (Soliz et al., 2006) limit the need for assurance relational maintenance behaviors.

The fact that the grandchildren reported that openness was used least frequently by their grandparents is initially peculiar because grandchildren perceive trustworthy grandparents as ideal (Mansson, 2015). However, it is possible that grandparents portray their GP-GC relationship feelings through their actions, such as giving gifts and offering assistance while being positive and family oriented, which may limit the need to overtly discuss their GP-GC relationship feelings. Alternatively, grandchildren's reports of their grandparents' comparatively limited use of openness may simply be due to grandchildren's own restricted use of openness with their grandparents (Mansson et al., 2010). Moreover, grandparents discussing their fears, which is a part of openness, may be perceived negatively by the grandchildren. Many older people are concerned about their health, social involvement, and financial status (Harwood, 2018), but grandparents are wise to keep such concerns to themselves because grandchildren experience discomfort when grandparents engage in painful self-disclosure (e.g., discussing their medical concerns, personal problems) with their grandchildren (Barker, 2007). Similarly, while advice emerged as a frequently used relational maintenance behavior, grandparents should carefully distinguish between solicited and unsolicited advice. Eisenberg (1988) reported that grandparents, in particular grandmothers, tend to offer unwanted advice to their grandchildren, which suggests that the association between some (e.g., advice and openness) relational maintenance behaviors and positive relational characteristics may be curvilinear in nature.

The results also indicated that grandparent and grandchild sex did not have significant effects on grandchildren's perceived grandparental use of relational maintenance behaviors. Although this contradicted the first set of subhypotheses and previous studies, albeit in different relational contexts, this finding should be perceived favorably. Simply put, these findings indicate that grandchildren, irrespective of sex, may be able to benefit equally from their grandparents, regardless of their grandparents' sex and the GP-GC family lineage, which is important because most grandparents are grandmothers (Hoffman, 1979–1980) as women live longer than men (United States Census Bureau, 2011). Taken together, these ideas correspond with Canary and Hause's (1993) meta-analysis of sex differences in communication, in which sex was found to have marginal effects on communication behaviors. This also implies that, as grandchildren face the loss of their grandfathers, the important bond

grandchildren establish with their grandparents may continue as grandmothers and grandfathers are perceived to use relational maintenance behaviors to similar degrees.

Also, grandchildren's perceptions of their grandparents' use of relational maintenance behavior were not affected by GP-GC family lineage, which contradicts KST's assumption that paternity certainty affects the GP-GC relationship. This finding coupled with previous GP-GC family lineage studies (e.g., Block, 2000; Eisenberg, 1988; Mansson, 2013c) suggest that KST's scope should be examined further as many, but not all, GP-GC behaviors and relational characteristics can be predicted by KST. For instance, Eisenberg (1988) reported that grandchildren are most likely to receive financial support from their maternal grandfathers. This may be particularly important to young adult grandchildren attending college as many college students are stressed and concerned about their financial status, which can affect grandchildren's social integration negatively while in college (Ross, Niebling, & Heckert, 1999).

The positive associations established between grandchildren's perceptions of their grandparents' use of relational maintenance behaviors and grandchildren's self-reported GP-GC relational characteristics also are favorable as grandchildren actively maintain their GP-GC relationships when they like their grandparents, and when they are communicatively and relationally satisfied. Thus, the positive affect grandchildren experience when they perceive their grandparents to enact relational maintenance behaviors may serve as a reciprocal motivator for grandchildren to also sustain their GP-GC relationships. This idea can be tested by collecting dyadic GP-GC data in which relational characteristics mediate the association between grandparents' and grandchildren's reciprocal use of relational maintenance behaviors. Moreover, assurances, conflict management, and positivity were most closely associated with the relational characteristics. Thus, grandparents who wish to influence their grandchildren's perceptions of their GP-GC relationship should emphasize the use of those three relational maintenance behaviors.

Future Directions

Because this is the first study focusing on grandchildren's perceptions of their grandparents' use of relational maintenance behaviors, it not only offers initial insight into this unique, intergenerational relationship, it also is indicative of the need for future investigations. Although some ideas for future GP-GC research have been offered in previous sections, a few additional GP-GC research areas are worth mentioning. Researchers should examine the extent to which grandchildren's perceptions of their grandparents' use of relational maintenance behaviors influence grandchildren's shared family identity with their grandparents and their willingness to serve as caregivers for their aging grandparents. America is an age-segregated nation (Hagestad & Uhlenberg, 2005) in which

there is a bias against older people (Harwood, 2018). Moreover, the American population is racially and ethnically diverse, which has resulted in approximately 17% interracial marriages (Pew Research Center, 2017). As such, many of the negative stereotypes against racially or ethnically diverse and older people are present within families as well as in society in general. Thus, if grandparents can influence their grandchildren's perceived shared family identity, grandchildren may develop a more favorable attitude toward older and racially or ethnically diverse people.

American population projections indicate that the proportion of people above the age of 65 years will increase by roughly 85% from 2012 to 2040, but the proportion of people aged 18 to 65 years will only increase by 10.5% during the same time-period, which is believed to affect both family life and the health-care system (Ortman, Velkoff, & Hogan, 2014). As people age, their health tends to decline (Harwood, 2018). These "increases in life-expectancy and chronic illnesses have drastically amplified the burden experienced by family caregivers" (Egbert, 2014, p. 307), many of whom are grandchildren (Bursack, 2018). It seems likely, however, that grandchildren's willingness to care for their grandparents is influenced by grandchildren's perceptions of how well grandparents maintain their GP-GC relationships and grandchildren's perceived GP-GC relational characteristics. Thus, researchers should examine both indirect and direct effects of perceived grandparental relational maintenance behaviors on grandchildren's willingness to serve as caregivers via perceived GP-GC relational characteristics.

Limitations

Although this study advances our understanding of the GP-GC relationship and provides directions for future research, its limitations should not be overlooked. First, this study focused on young adult (i.e., 18–25 years old) college students and the results may therefore not be generalizable to older and younger grandchildren, and grandchildren who do not attend college. GP-GC interactions tend to decrease as grandchildren enter young adulthood (Kam & Nussbaum, 2008), suggesting that some relational maintenance behaviors may be used less frequently as grandchildren transition into adulthood, in particular tasks and networks as they generally require face-to-face interactions. Relatedly, grandchildren live on average approximately 320 miles from their grandparents while attending college (Mansson & Booth-Butterfield, 2011) and they therefore often prefer to engage in mediated GP-GC interactions during that time (Fowler, 2018), which may affect GP-GC relational maintenance behaviors as geographical distance impacts the use of relational maintenance behaviors (Johnson, 2001).

The second limitation is related to the study design. Specifically, this was a one-shot survey study in which causality cannot be determined, and the participants are required to "not only report, but also scale previous behaviors" that

may raise recall concerns (Stayman & Aaker, 1993, p. 200). To combat these concerns, researchers should strive to collect longitudinal, dyadic data in which participants report daily or weekly to minimize potential recall concerns and to enable researchers to establish causal relationships. In doing so, researchers can also compare grandparents' self-reported use of relational maintenance behaviors to their grandchildren's other reports of grandparents' use of such behaviors. This may be of particular importance because it is possible that grandparents engage in relational maintenance behaviors that go unnoticed by their grandchildren, such as suggesting family gatherings, discussing the grandchildren's tasks and concerns with the grandchildren's parents as a means of spending more time with their grandchildren. The study design may also have resulted in some social desirability biases (SDB), which Frey, Botan, and Kreps (2000) argued are most common in quantitative survey research, in particular in studies emphasizing favorable attitudes and behaviors. Thus, the inclusion of a SDB scale that may be used as a control variable will address possible SDB concerns in future investigations.

It also should be noted that Stafford and coworkers have developed different relational maintenance typologies (Stafford, 2011; Stafford & Canary, 1991; Stafford et al., 2000) that include five to seven relational maintenance behaviors that vary slightly. Specifically, the most recent typology (Stafford, 2011) includes understanding and self-disclosure instead of advice and conflict management compared with the Stafford et al. (2000) typology. In this study, the seven-factor Stafford et al. (2000) scale was used for two reasons. First, people use a wider variety of relational maintenance behaviors to sustain family relationships compared with friendships, for example (Canary, Stafford, Hause, & Wallace, 1993). Second, grandchildren expect their grandparents to provide advice and guidance when needed and to influence how well grandparents and grandchildren get along (Kennedy, 1990). Consequently, advice and conflict management were deemed important relational maintenance behaviors in the GP-GC relationship that needed to be included in this study, making Stafford et al.'s (2000) seven-factor scale a more suitable operationalization of relational maintenance behaviors compared with Stafford's (2011) five-factor scale.

Conclusions

This study broke new ground in the GP-GC and relational maintenance literature in that it was the first study to examine grandchildren's perceptions of their grandparents' use of relational maintenance behaviors, as opposed to grandchildren's self-reported use of such behaviors to sustain this mutually beneficial relationship. The results indicated that grandchildren perceive their grandparents to use relational maintenance behaviors to similar degrees, regardless of grandparent and grandchild sex. Moreover, GP-GC family lineage did not affect grandchildren's perceptions of their grandparents' use of relational maintenance

behaviors, but perceived grandparental use of relational maintenance behaviors was associated positively with grandchildren's self-reported GP-GC relational characteristics (i.e., communication satisfaction, emotional closeness, liking, and relational satisfaction). These relational characteristics are central components of GP-GC solidarity, which is of utmost importance to the GP-GC relationship (Silverstein et al., 1998) as they in turn have been linked to grandchildren's own tendencies to maintain their GP-GC relationships (Mansson, 2016a; Mansson et al., 2010). Thus, relational maintenance behaviors appear to be reciprocal and critical to the sustainment of positive GP-GC relationships.

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Article

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The Role of Grandchildren's Own Age-Related Communication and Accommodation From Grandparents in Predicting Grandchildren's Well-Being

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Abstract

This study examined how the accommodative environments experienced from grandparents and grandchildren's own age-related communication are indirectly associated with grandchildren's life satisfaction, depressive symptoms, and loneliness, via grandchildren's self-efficacy with respect to aging. The communication experienced from grandparents was classified as accommodative, ambivalent, and mixed-accommodative chatter. Grandchildren were classified into engaged, disengaged, bantering, and disengaged-joking profiles based on their own age-related communication. Grandchildren who experienced accommodative chatter were likely to be engaged and disengaged communicators about age-related issues; grandchildren who experienced mixed-accommodative chatter were likely to be bantering communicators about age-related issues. Relative to engaged communicators, disengaged-joking

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communicators demonstrated lower life satisfaction, more depressive symptoms, and greater loneliness, via lower self-efficacy with respect to aging. Patterns of accommodation and nonaccommodation from grandparents may place grandchildren on specific trajectories for communicating about age, and grandchildren's own communication may be consequential for well-being even at relatively young periods of the life span.

Keywords
communicative ecology model of successful aging, grandparents, grandchildren, depressive symptoms, loneliness

Using the *communicative ecology model of successful aging* (CEMSA; Fowler, Gasiorek, & Giles, 2015; Gasiorek, Fowler, & Giles, 2016), this study explores, for the first time, how grandchildren's own age-related communication and the patterns of (non)accommodation they perceive from grandparents predict grandchildren's well-being, via grandchildren's self-efficacy with respect to aging. Examining grandchildren's well-being as the product of their own and older family members' communication is warranted given that people's well-being is partly in their own control and partly the result of their social relationships (Jopp & Rott, 2006). As Gasiorek and Fowler (2016) argued, a well-established body of research speaks to young adults' stereotypes of older adults and the dynamics of intergenerational communication shaped by such stereotypes (e.g., Hummert, 2019; Hummert, Garstka, Ryan, & Bonnesen, 2004; Ryan, Giles, Bartolucci, & Henwood, 1986), yet relatively little research has investigated how young adults speak about *their own* aging trajectories. This is an important gap to fill given that the ideologies people communicatively construct and psychologically internalize about their aging during their younger years may be consequential for how well they age during their later years (Giles, Davis, Gasiorek, & Giles, 2013; Levy, Slade, Kunkel, & Kasl, 2002; Nussbaum & Fisher, 2011).

In addition to examining the implications of grandchildren's own age-related communication, this study explores how grandparents' accommodation toward grandchildren predicts the ways in which grandchildren speak about age-related issues as well as grandchildren's well-being. A robust literature outlines how grandparent–grandchild (GP–GC) connections might influence both parties' well-being (for reviews, see Hayslip & Fruhauf, 2019; Szinovacz, 1998b). Szinovacz (1998a), for example, reviewed research grounded in life-course theory emphasizing that past GP–GC experiences are integral to understanding current functioning in GP–GC relationships and both parties' well-being. Thus, grandparents' larger histories of accommodating toward grandchildren might

predict grandchildren's mental well-being (e.g., Mansson, 2013). Tomlin (1998) also reviewed how grandparents often function as mentors or motivators for their grandchildren, thereby inspiring their grandchildren to age with patience, tenacity, and other virtues. From this perspective, grandparents who are especially accommodative toward grandchildren might inspire grandchildren to communicate about aging in relatively adaptive ways. Consistent with this reasoning, Jopp, Jung, Damarin, Mirpuri, and Spini (2017) found that adults most often mentioned their parents (25.8% of the sample) and grandparents (24.5% of the sample) as their role models for how to age well (see also Holladay, 2002). References to parents and grandparents far surpassed references to other types of people, such as aunts (6.0%), uncles (2.0%), siblings (2.0%), friends (7.3%), and movie stars (6.6%).

Despite the great potential for grandparents to influence their grandchildren's aging trajectories, many questions remain. For example, Allen, Henderson, and Murray (2019) recently reviewed GP–GC research published from 2010 through 2017 in a variety of family and intergenerational journals. Over half of the published studies (54.55%) focused on grandparents raising grandchildren (either as custodial grandparents or grandparents living in the same household as parents and grandchildren). Many of the remaining studies (29.55%) focused on issues surrounding GP–GC relationship quality (e.g., relational closeness and relational satisfaction). A much smaller number of studies (4.54%) focused on how noncustodial grandparents support grandchildren and provide other resources conducive to grandchildren's well-being. One of the main premises of this study is that the ways in which grandparents treat grandchildren (as manifested in grandparents' patterns of accommodation toward grandchildren) might act as communicative resources that facilitate or hinder grandchildren's aging trajectories.

In the following sections, we first conceptualize successful aging and discuss the study's focus on three aspects of well-being, namely high levels of life satisfaction, low levels of depressive symptoms, and low levels of loneliness. We then review the CEMSA's logic and discuss how the accommodation, overaccommodation, and underaccommodation young adult grandchildren receive from grandparents might predict grandchildren's own age-related communication. Next, we discuss how the accommodative environments grandchildren experience from grandparents and the environments grandchildren construct through their own age-related communication might be indirectly associated with grandchildren's well-being, via grandchildren's self-efficacy with respect to aging.

Successful Aging, Defined

Scholars have proposed a variety of definitions to describe successful aging, with no one definition gaining uniform consensus (Depp & Jeste, 2006). Rowe and

Kahn (1997) proposed that successful aging involves (a) avoiding disease and disability, (b) maintaining high cognitive and physical functioning, and (c) remaining actively engaged with life by maintaining interpersonal relationships and giving back to society (e.g., by volunteering in a local church or caring for an ill family member; see also Herzog & Morgan, 1992). Garfein and Herzog (1995) similarly defined successful aging with these three components, but they also included affective well-being as a fourth aspect of successful aging. In one study (Cho, Martin, & Poon, 2012), approximately 15% of octogenarians and no centenarians satisfied all three components of Rowe and Kahn's (1997) successful aging definition. However, roughly 62% of octogenarians and 48% of centenarians were classified as aging successfully according to a set of subjective criteria (e.g., general happiness with life). Synthesizing these different traditions, scholars have recommended that these varying conceptualizations of successful aging be divided into two major strands (Baltes & Carstensen, 1996; Gasiorek et al., 2016; Pruchno, Wilson-Genderson, & Cartwright, 2010): relatively objective variants of successful aging (e.g., avoiding cardiovascular disease, easily walking one-quarter of a mile by oneself) and relatively subjective variants of successful aging (e.g., life satisfaction, self-reported depressive symptoms).

Although a number of factors have been implicated in the process of successful aging, this study selects three variants found to be important subjective constituents of it (Bernhold, Gasiorek, & Giles, 2018): high levels of life satisfaction, low levels of depressive symptoms, and low levels of loneliness. *Life satisfaction* is frequently mentioned by lay older adults in their open-ended responses of what it means to age successfully, with these responses characterized by a general happiness and contentment with life (Tate, Swift, & Bayomi, 2013). Scholars have also repeatedly included general satisfaction with life as one element of their successful aging definitions (e.g., Nussbaum, 1985; Phelan & Larson, 2002). *Depression* is one of the most common mental difficulties in the United States, characterized by persistent feelings of sadness, hopelessness, helplessness, and loss of interest in hobbies or other activities once considered enjoyable (National Institute of Mental Health, 2018). In addition to overall life satisfaction, researchers have included low levels of depressive symptoms as another component of successful aging (Montross et al., 2006). High levels of depressive symptoms have been shown to co-occur with more objective aspects of unsuccessful aging, such as the inability to dress oneself or walk across a room by oneself (Livingston Bruce, Seeman, Merrill, & Blazer, 1994).

Loneliness refers to a sense that the quantity or quality of one's social relationships is inadequate; lonely people often feel alienated from meaningful social interactions and relationships (Wright, Burt, & Strongman, 2006). Examining lay older adults' perspectives of successful aging across 10 Latin-American and European countries, Fernández-Ballesteros et al. (2010) found that participants endorsed avoiding loneliness and isolation, as well as being able to rely on

family members and friends when needed, as key aspects of successful aging. A similar study reported that a large majority (over 75%) of European-American and Japanese-American older adults rated global life satisfaction and low levels of loneliness as two important components of successful aging (Phelan, Anderson, LaCroix, & Larson, 2004). Jopp et al. (2015) found that young, middle-aged, and older adults generally hold similar perceptions of what constitutes successful aging, with frequent references to life satisfaction and feelings of belongingness. Corresponding with these academic and lay definitions, researchers using the CEMSA have treated life satisfaction, depressive symptoms, and loneliness as three variants of successful aging (Bernhold et al., 2018). These aspects of successful aging are also the main focus of this study. We refer to them as aspects of well-being throughout the remainder of the study.

The CEMSA

An Overview of the CEMSA

Building on the foundation that communication is central to successful aging (Giles et al., 2013), Fowler et al. (2015) created the CEMSA with the recognition that people have some control over their own aging trajectories. In this way, the CEMSA joined other theories and models (e.g., the lifespan theory of control: Heckhausen & Schulz, 1995) in holding that people have some agency over the extent to which they age well. However, unlike many other theories and models, the CEMSA proposes that the way in which people realize this agency is through their *communication* about age-related issues (see also Nussbaum, 1985, 2007; Ryan, Meredith, Maclean, & Orange, 1995). Figure 1 displays a recent visual model of the CEMSA's proposed interrelationships (after Gasiorek et al., 2016). As the figure illustrates, the messages that people hear about aging (termed *environmental chatter*) predict people's uncertainty about aging, own age-related communication, affect about aging, and self-efficacy with respect to aging. People's uncertainty about aging predicts their own age-related communication, affect about aging, and self-efficacy with respect to aging (see Gasiorek, Fowler, & Giles, 2019). Own age-related communication predicts affect about aging and self-efficacy with respect to aging; affect about aging also predicts self-efficacy with respect to aging. Self-efficacy with respect to aging is then posited as the proximate predictor of successful aging.

Our study here focuses on young adult grandchildren with a subset of constructs, namely environmental chatter (in the form of grandparents' accommodation and nonaccommodation toward grandchildren), grandchildren's own age-related communication, self-efficacy with respect to aging, and successful aging (treated here as three aspects of well-being: life satisfaction, depressive symptoms, and loneliness). These constructs and their interrelationships are elaborated in more detail later.

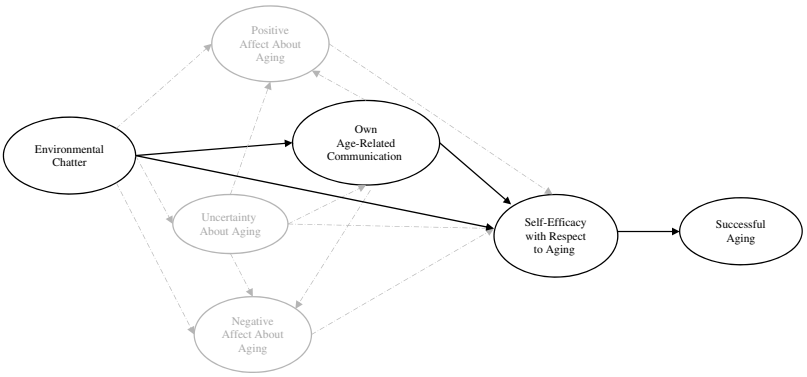

Figure 1. The communicative ecology model of successful aging (CEMSA). *Note*. In this study, environmental chatter is considered in terms of grandparents' accommodation, overaccommodation, and underaccommodation toward their grandchildren. Successful aging is considered as three aspects of well-being, namely grandchildren's life satisfaction, depressive symptoms, and loneliness. Constructs and pathways outlined in black and solid lines are the focus of this study; constructs and pathways outlined in gray and dashed lines are part of the CEMSA, but are not the focus of this study.

Profiles of Environmental Chatter and Own Age-Related Communication

Environmental chatter. In an extended version of the CEMSA, Gasiorek et al. (2016) formally introduced *environmental chatter* to describe the messages about aging that people receive from relational partners, strangers, and the media. The term *chatter* in this concept highlights the possibility that these messages might not always be carefully processed in everyday life yet, over time, the messages might contribute to a larger environment or ecology that influences well-being. Gasiorek et al. argued that at least four types of communication constitute environmental chatter: (a) hearing memorable messages about aging, (b) observing how liked role models behave with respect to aging, (c) receiving (non)accommodative communication from relational partners, and (d) viewing and internalizing media messages about aging. This study seeks to explore further one component of environmental chatter, namely GP–GC conversations as they relate to accommodation.

Communication accommodation theory (CAT: e.g., Giles, 2016; Soliz & Colaner, 2018) addresses how speakers adjust their communication during interaction as well as the consequences of these moves. *Accommodation* refers to communication that is adjusted to meet listeners' needs; speakers often accommodate listeners to facilitate comprehension or build relational solidarity (Soliz & Giles, 2014). In GP–GC relationships, accommodation can be manifest by grandparents complimenting their grandchildren or showing affection to them (Harwood, 2000). *Nonaccommodation* involves communicative moves that are designed to

convey or interpreted as conveying dissimilarity, rejection, or disconfirmation (Gasiorek, 2016). From the receiver's perspective, nonaccommodation can also be apparent in over- and underaccommodative terms. *Overaccommodation* describes instances when a speaker overshoots or goes too far in adjusting to the listener (N. Coupland, Coupland, Giles, & Henwood, 1988). In the context of intergenerational relationships, overaccommodation often manifests as patronizing speech (e.g., Ryan, Bourhis, & Knops, 1991). *Underaccommodation* refers to instances when a speaker does not go far enough in adjusting to the listener (N. Coupland et al., 1988). Grandparents could be labeled as underaccommodators with their grandchildren when they adopt painful self-disclosures about their lives (e.g., talking about their health problems, complaining about other aspects of their lives; N. Coupland, Coupland, & Giles, 1991), and grandchildren find such disclosures uncomfortable (Barker, 2007; Fowler & Soliz, 2010).

As Bernhold et al. (2018) discussed, much research has examined how single constructs from CAT (e.g., accommodation) predict various outcomes, such as relational satisfaction (e.g., Speer, Giles, & Denes, 2013). One less-studied topic pertains to the overall accommodative climates that family members experience. For instance, do some grandchildren experience high amounts of accommodation, overaccommodation, *and* underaccommodation from grandparents (as might be the case, for example, when grandchildren perceive that their grandparents love them, but also that their grandparents are not always aware of which topics grandchildren would prefer to avoid)?

Using a sample of older adults, Bernhold et al. (2018) found that some participants experienced *negative chatter* environments characterized by relatively low accommodation and relatively high overaccommodation from young adults. Other older adults experienced *positive chatter* environments characterized by relatively high accommodation and relatively low overaccommodation from young adults. A third subset of older adults experienced *mixed-positive* environments characterized by moderate amounts of both accommodation and overaccommodation from young adults. However, Bernhold et al.'s study focused on older adults' relationships with young adults in general rather than a specific type of relational partner. The researchers also did not consider how underaccommodation fits into these environments. This study builds on these findings and contributes to CAT's development by exploring how participants in a specific type of intergenerational relationship experience accommodation, overaccommodation, and underaccommodation from relational partners. Because we had little basis for speculating the number and types of profiles that would emerge for grandchildren reporting on their communication with a specific grandparent, we asked the following:

RQ1: Can grandchildren be classified into profiles based on their experiences of receiving accommodation, overaccommodation, and underaccommodation from grandparents?

Own age-related communication. The CEMSA includes seven types of own age-related communication (for a more comprehensive explanation of each communication component, see Fowler et al., 2015): self-categorizing as old (e.g., making age-related excuses to account for one's shortcomings; Eibach, Mock, & Courtney, 2010), expressing optimism about the aging process (e.g., mentioning that one is excited about the future; Levy, Slade, & Kasl, 2002), colluding in the teasing of others about their age (e.g., sending ageist birthday cards to relational partners; Demos & Jache, 1981), responding when one is the subject of ageism (e.g., playing along when one is the subject of age-related teasing; Ryan, Kennaley, Pratt, & Shumovich, 2000), engaging with anti-aging media (e.g., being skeptical of anti-aging beauty products advertised on television and in magazines; J. Coupland, 2007), discussing future caregiving preferences (e.g., letting family members know about one's future caregiving preferences before a need for care arises; Pinquart & Sorensen, 2002), and engaging with new communication technologies (e.g., enjoying keeping in touch with family members and friends on social media; Jung, Walden, Johnson, & Sundar, 2017).

Across studies, people have been classified into three profiles based on their own patterns of age-related communication (Bernhold, 2019; Gasiorek & Barile, 2018; Gasiorek et al., 2015, 2019). *Engaged communicators about age-related issues* express relatively high levels of optimism about aging and skepticism about anti-aging products; they are also likely to discuss their caregiving preferences in advance and embrace new communication technologies. However, engaged communicators are relatively unlikely to self-categorize as old, tease others about their age, and play along with age-related jokes. *Disengaged communicators about age-related issues* seem to opt out of the aging process by not discussing many topics related to aging: They score relatively low on six of the seven age-related communication behaviors, but their embracing of new communication technologies is similar to that of people in the other two profiles. Finally, *bantering communicators about age-related issues* score relatively high on six of the seven communication behaviors, with the exception that their discussions of future caregiving preferences are somewhat less frequent than the caregiving discussions of engaged communicators. Bantering communicators are distinct in their relatively high levels of self-categorizing as old, teasing others about age, and playing along when they are the subject of age-related jokes. Given that these three profiles have repeatedly emerged in previous research (including research on young adults), we hypothesized that we would be able to replicate them:

> **H1:** Grandchildren can be classified into three profiles based on their own age-related communication, namely engaged, disengaged, and bantering communicators about age-related issues.

Environmental chatter as a predictor of own age-related communication. A unique contribution of this study is to explore potential relationships between the two kinds of profiles involved in RQ1 and H1. The direct pathway from environmental chatter to own age-related communication in Figure 1 suggests that the environmental chatter profiles might predict the own age-related communication profiles. Young adults have reported that older adults patronize them and that this patronization has invoked more anger and resentment compared to less condescending (more neutral) statements (Giles & Williams, 1994). They have also reported that overaccommodation and underaccommodation from older adults stimulate negative age stereotypes and adverse feelings and debilitation about growing older (Williams & Giles, 1996). Thus, it seems reasonable that being the recipient of certain kinds of environmental chatter might predict the emergence of certain forms of age-related communication (e.g., a chatter profile characterized by low levels of accommodation and high levels of nonaccommodation might predict grandchildren's membership in the disengaged profile). As another possibility, grandparents who accommodate grandchildren and avoid nonaccommodation might *lift up* grandchildren, thereby encouraging grandchildren to become engaged communicators about age-related issues. The following general hypothesis was, thus, proposed:

H2: The environmental chatter profiles will predict the own age-related communication profiles of engaged, disengaged, and bantering communicators about age-related issues.

Own Age-Related Communication and Environmental Chatter as Indirect Predictors of Well-Being

One of the CEMSA's guiding premises is that people have agency over the extent to which they age well, and they realize this agency through their communication (Fowler et al., 2015). Consistent with this notion, own age-related communication is posited to indirectly predict well-being, via self-efficacy with respect to aging. Using a sample of young adults, Gasiorek and Fowler (2016) found that engaged communicators about age-related issues reported greater self-efficacy with respect to aging than bantering and disengaged communicators about age-related issues. In a sample of middle-aged adults, Gasiorek et al. (2015) found that engaged communicators about age-related issues reported greater self-efficacy with respect to aging and greater well-being compared to bantering communicators about age-related issues. Another study of middle-aged and older adults showed that engaged and bantering communicators about age-related issues demonstrated

greater life satisfaction than disengaged communicators about age-related issues (Gasiorek & Barile, 2018). Research has also begun to explore indirect associations involving own age-related communication. Bernhold et al. (2018) found that, relative to engaged older adults, disengaged older adults reported less life satisfaction, more depressive symptoms, and greater loneliness, via lower self-efficacy with respect to aging. Collectively, these findings suggest the following:

> **H3:** Relative to those using an engaged age-related communication style, all other own age-related communication profiles will be indirectly associated with lower well-being, via lower self-efficacy with respect to aging.

Well-being is also thought, in part, to be the product of one's social relationships (Depp & Jeste, 2006; Hendricks & Hatch, 2009). Along these lines, the CEMSA proposes that environmental chatter is indirectly associated with well-being, via self-efficacy with respect to aging. In this way, the accommodative environments that grandchildren experience from grandparents might be indirectly associated with grandchildren's well-being, via self-efficacy with respect to aging. Past theorizing and research also lend merit to this possibility. For example, the communication predicament of aging model (Ryan et al., 1986) proposes that the overaccommodation older adults experience from young adults leads to older adults feeling less control over their lives; this reduced sense of control subsequently predicts lower psychological and physiological well-being. Older adults who receive more nonaccommodation from young adults (operationalized as a combination of overaccommodation and underaccommodation) have reported less self-esteem and reduced life coherence compared to their counterparts who receive less nonaccommodation (Ota, Giles, & Somera, 2007). Although past CAT scholarship has more often examined the consequences of nonaccommodation for older adults, similar implications may hold for young adults. For example, when grandparents underaccommodate grandchildren, grandchildren may develop relatively bleak images of what their own futures hold (e.g., "Will I complain like that when I am older?"). Conversely, grandchildren who regularly receive accommodation from grandparents may be more confident that they will be able to age gracefully (e.g., "I want to be that good of a conversationalist when I am older"). This reasoning suggests the following:

> **H4:** The environmental chatter profiles (in the form of grandparents' accommodation, overaccommodation, and underaccommodation toward grandchildren) will be indirectly associated with grandchildren's well-being, via grandchildren's self-efficacy with respect to aging.

Method

Participants and Procedures

This was a single-party study of grandchildren. As such, all demographic information and all responses to the substantive measures in the "Method" section were provided by grandchildren.

A total of 423 young adult grandchildren ($M_{Age} = 19.78$ years, $SD_{Age} = 1.54$ years) were recruited from a Communication department's online research participation system at a large public university in the western United States. Any student was eligible to participate as long as they had at least one currently living grandparent with whom they had a relationship. Grandchildren were grandsons (28.1%) and granddaughters (71.6%), with 0.2% of grandchildren not providing their biological sex. Grandchildren's ethnicities were African American (2.8%), Asian American (18.9%), European American (52.5%), Latina/o American (13.9%), Multi-Ethnic (7.3%), Native American (0.2%), Other (4.0%), and unreported (0.2%). Grandchildren described their own socioeconomic status (SES) as follows: lower class (11.3%), middle class (72.3%), and upper class (15.6%), with 0.7% of grandchildren not reporting this information.[1]

Grandchildren were instructed to think about their relationship with one of their grandparents. Consistent with other research (e.g., Kam & Hecht, 2009), they could choose whichever grandparent they wanted as long as the grandparent was currently living. We requested that grandchildren write their chosen grandparent's initials in the survey, which was similar to requests in other family communication studies (e.g., Mansson & Booth-Butterfield, 2011; Mansson, Myers, & Turner, 2010). The purpose of this request was to further emphasize the salience of a specific grandparent in grandchildren's minds so that they would not answer the substantive items thinking about how multiple grandparents communicated with them in general. We also explicitly instructed grandchildren to complete the items thinking about the specific grandparent whose initials they wrote rather than considering all of their grandparents in general.

Grandparents were grandfathers (28.1%) and grandmothers (71.6%), with 0.2% of grandchildren not providing this information. On average, grandparents were 76.43 years old ($SD_{Age} = 7.77$ years). Ethnicities of grandparents were African American (2.8%), Asian American (19.9%), European American (57.7%), Latina/o American (13.5%), Multi-Ethnic (1.2%), Native American (0.2%), Other (4.0%), and unreported (0.7%). Grandchildren described their grandparents' SES as lower class (12.3%), middle class (70.0%), and upper class (17.0%), with 0.7% of grandchildren not providing this information. The vast

majority of grandparents were biologically related to grandchildren (94.8%). Some grandchildren reported on a grandparent in an adopted family (2.4%), some grandchildren reported on a stepparent's parent (1.7%), and some grandchildren reported on a biological grandparent's second spouse (0.9%), with 0.2% of grandchildren not specifying their relationship with the grandparent.

Measures

Bivariate correlations between all substantive variables appear in Table 1. The online appendix provides the full list of items used for this study.

Accommodation. Six items from Harwood (2000) assessed grandparents' accommodation (e.g., "My grandparent compliments me," $M = 5.89$, $SD = 1.01$, $\alpha = .93$). The items were answered on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*), with higher scores indicating more accommodation.

Overaccommodation. Two items from Harwood (2000) and two items from Bernhold et al. (2018) gauged grandparents' overaccommodation (e.g., "My grandparent talks down to me," $M = 2.67$, $SD = 1.30$, $\alpha = .86$). The four items were answered on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*), with higher scores indicating greater overaccommodation.

Underaccommodation. Seven items from Harwood (2000) measured grandparents' underaccommodation (e.g., "My grandparent complains about his/her life circumstances," $M = 3.38$, $SD = 1.27$, $\alpha = .85$). The items were answered on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*), with higher scores indicating greater underaccommodation.

Own age-related communication. A total of 21 items from Fowler et al. (2015) measured grandchildren's own age-related communication. Three items measured each of the following behaviors: self-categorizing based on age (e.g., "I often hear myself explaining away some event by referring to my age"), expressing optimism about aging (e.g., "I frequently express the fact that I am optimistic about aging"), teasing others about their age (e.g., "I often tease others about their age"), responding when one is the subject of ageism (e.g., "When others make jokes about my age, I usually play along"), demonstrating skepticism to anti-aging media (e.g., "I resent the ads that claim I should work at looking younger"), discussing future caregiving preferences (e.g., "I have talked with my family and friends about my wishes regarding care as I age"), and embracing new technology (e.g., "I enjoy keeping up with new communication technologies such as social media or new smart phone apps"). The items were answered on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly*

Table 1. Bivariate Correlations Between Study Variables.

	1	2	3	4	5	6	7	8	9	10	11
Own communication: engaged probability (1)	1	–	–	–	–	–	–	–	–	–	–
Own communication: disengaged probability (2)	−.49***	1	–	–	–	–	–	–	–	–	–
Own communication: disengaged-joking probability (3)	−.32***	−.30***	1	–	–	–	–	–	–	–	–
Own communication: bantering probability (4)	−.32***	−.37***	−.17**	1	–	–	–	–	–	–	–
Chatter: accommodative probability (5)	.05	.12*	−.02	−.19***	1	–	–	–	–	–	–
Chatter: mixed-accommodative probability (6)	−.04	−.10*	−.03	.21***	−.78***	1	–	–	–	–	–
Chatter: ambivalent probability (7)	−.03	−.03	.08	<.01	−.45***	−.22***	1	–	–	–	–
Self-efficacy with respect to aging (8)	.08†	.09†	−.13**	−.09†	.09†	−.10†	<.01	1	–	–	–
Life satisfaction (9)	−.01	.01	<.01	.01	.12*	−.07	−.09†	.47***	1	–	–
Depressive symptoms (10)	.02	.02	.02	−.06	−.14**	.15**	.00	−.41***	−.52***	1	
Loneliness (11)	−.02	<.01	.08	−.05	−.22***	.22***	.03	−.37***	−.56***	.65***	1

Note. Two-tailed.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

agree). Consistent with past research (e.g., Gasiorek et al., 2015), reliability coefficients are not reported for these items because latent profile analysis treats all 21 items as individual contributors to the latent profiles.

Self-efficacy with respect to aging. Six items from Fowler et al. (2015) assessed grandchildren's self-efficacy with respect to aging (e.g., "I feel able to cope with things that might happen to me as I age," $M = 4.77$, $SD = 0.93$, $\alpha = .79$). The items were answered on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*). Responses to the six items were averaged, with higher scores indicating greater self-efficacy with respect to aging.

Life satisfaction. Six items from Fowler et al. (2015) measured grandchildren's life satisfaction. Three items (e.g., "I am happy with the age I am right now") were answered on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*). The other three items (e.g., "How successfully have you aged up until now?") were answered on 7-point semantic differential formats (e.g., 1 = *not at all well*, 7 = *extremely well*, $M = 5.61$, $SD = 0.89$, $\alpha = .83$). Responses to the six items were averaged, with higher scores indicating greater life satisfaction.

Depressive symptoms. Consistent with past research (Bernhold et al., 2018), six items from the Center for Epidemiologic Studies Depression Scale (CES-D Scale; Radloff, 1977) measured grandchildren's depressive symptoms (e.g., "I felt like I could not stop feeling sad even with help from family or friends," $M = 1.77$, $SD = 0.62$, $\alpha = .82$). Participants reflected on their experiences over the past week and answered the items on 4-point scales ranging from *rarely or none of the time (less than one day)* to *most or all of the time (five to seven days)*. Responses to the six items were averaged, with higher scores indicating more depressive symptoms.

Loneliness. Consistent with past CEMSA research (Bernhold et al., 2018), three items from the Revised UCLA Loneliness Scale (Russell, 1996) assessed grandchildren's loneliness (e.g., "I feel alone," $M = 2.20$, $SD = 0.86$, $\alpha = .85$). Participants answered the items on 5-point scales ranging from *never* to *always*. Responses to the three items were averaged, with higher scores indicating more loneliness.

Covariates. When testing how own age-related communication profile membership and environmental chatter profile membership were indirectly associated with the three variants of well-being, a set of grandparent and grandchild characteristics was controlled. Grandchildren's sex (0 = male, 1 = female), age, ethnicity (0 = ethnic minority, 1 = European American), and SES (1 = lower class, 2 = middle class, 3 = upper class) were controlled. Grandparents' sex (0 = male,

1 = female), age, ethnicity (0 = ethnic minority, 1 = European American), and SES (1 = lower class, 2 = middle class, 3 = upper class) were also controlled.

Results

Environmental Chatter and Own Age-Related Communication Profiles

Environmental chatter profiles. RQ1 inquired about the profiles that would emerge based on grandchildren's experiences of receiving accommodation and nonaccommodation from grandparents. To test RQ1, we ran a series of latent profile analyses (LPAs) in *Mplus* 7.3 (Muthén & Muthén, 1998–2014). LPA classifies a heterogeneous sample of participants into relatively homogeneous subgroups (or profiles) based on their response patterns to a series of continuous indicators. Participants in the same profile demonstrate similar response patterns to one another, but different response patterns from participants in other profiles. Five LPA models were run, with each model specifying one more latent profile ($k + 1$ profiles) than the previous model (k profiles). Each LPA model contained the six accommodation items, four overaccommodation items, and seven underaccommodation items as individual indictors. Table S1 (available in the online-only supplemental materials) reports fit indices for these models. Researchers should select the final number of profiles based on a range of statistical and conceptual considerations. Statistically, the loglikelihood, Akaike information criterion (AIC), Bayesian information criterion (BIC), and sample-size adjusted Bayesian information criterion (aBIC) should demonstrate relatively sharp declines in absolute value when moving from the k-profile model to the $(k + 1)$-profile model in order to justify the additional profile. Relatively flat declines indicate that the additional profile may be unnecessary. Recent simulation work suggests that the BIC and aBIC are especially helpful for identifying the best solution (see Morgan, 2015). Conceptually, profiles should be meaningfully distinct from one another.

A three-profile solution was judged most appropriate to characterize participants' experiences of environmental chatter (see Figure 2 for a latent profile plot). The first profile (comprising 59.9% of the sample) was labeled *accommodative* environmental chatter. Participants in the accommodative profile reported high accommodation from their grandparent as well as low overaccommodation and underaccommodation from their grandparent.

The second profile (comprising 10.7% of the sample) was labeled *ambivalent* environmental chatter. Participants in the ambivalent profile tended to slightly disagree that they received accommodation from their grandparent. They also fell near the scale midpoint (corresponding to *neither agree nor disagree*) when asked about their grandparents' overaccommodation. Further, the ambivalent profile was characterized by slight agreement with grandparents engaging in underaccommodation. Most notably, grandchildren in this profile slightly

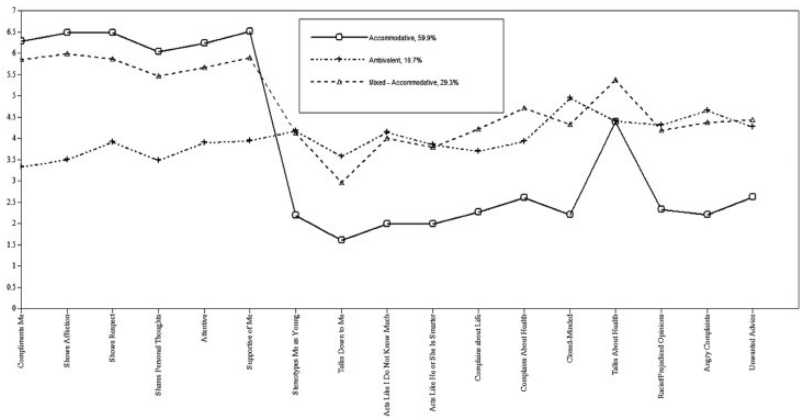

Figure 2. Latent profile plot of grandparents' (non)accommodation toward grandchildren.

agreed that their grandparent was closed-minded. The *ambivalent* label was chosen to name this profile because agreement or disagreement with specific items tended to be relatively slight in magnitude compared to the agreement or disagreement of participants in other profiles.

The third profile (comprising 29.3% of the sample) was labeled *mixed-accommodative* environmental chatter. Participants in the mixed-accommodative profile were similar to participants in the accommodative profile in reporting that their grandparents generally accommodated them. However, participants in the mixed-accommodative profile were generally similar to participants in the ambivalent profile when asked about their grandparent's overaccommodation and underaccommodation. Notably, participants in the mixed-accommodative profile reported the highest agreement that their grandparent complains about life, complains about health, and talks about health. The label *mixed-accommodative* was chosen to highlight that participants perceived their grandparent as accommodating them in many respects, but also as potentially underaccommodating them in other respects.

Own age-related communication profiles. H1 predicted that the engaged, disengaged, and bantering profiles would emerge based on participants' own age-related communication. To test H1, we ran another series of LPAs in *Mplus* 7.3. The indicators were the 21 individual items inquiring about participants' own age-related communication. A four-profile solution was deemed most appropriate for participants' own age-related communication (see Figure 3 for a latent profile plot). Partially supporting H1, three of the four profiles closely resembled the hypothesized profiles. *Engaged communicators about age-related issues* (comprising 33.7% of the sample) reported relatively high expressed optimism about

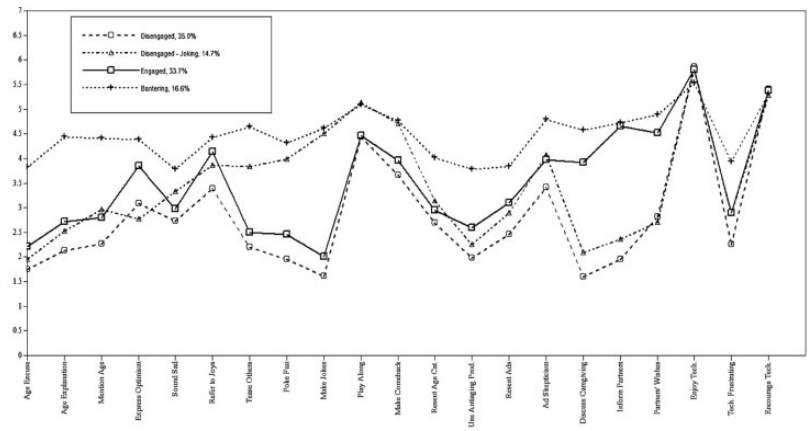

Figure 3. Latent profile plot of grandchildren's own age-related communication.

aging, discussions of future caregiving, and embracement of new technologies, but relatively low self-categorizing as old, teasing others about age, and playing along when they are the subject of ageism. These features resembled characteristics of engaged communicators from past research. One way in which engaged communicators in this study differed from engaged communicators in previous research is that the engaged communicators in this study were less likely than bantering communicators to report skepticism of anti-aging media. Using a different sample of young adults, Gasiorek and Fowler (2016) found that engaged communicators reported slightly more skepticism of anti-aging media than bantering communicators. The proportion of participants classified as engaged communicators in this study (33.7%) was somewhat higher than the proportion of participants who were engaged communicators in Gasiorek and Fowler's study (24.5%).

Disengaged communicators about age-related issues (comprising 35.0% of the sample) were the second profile. Consistent with Gasiorek and Fowler (2016), disengaged communicators in this study scored relatively low on six of the seven behaviors, but their embracing of new communication technologies paralleled that of participants in the other profiles. The proportion of participants classified as disengaged communicators in this study (35.0%) was very similar to the proportion of disengaged communicators in Gasiorek and Fowler's study (35.7%).

The third profile consisted of *bantering communicators about age-related issues* (comprising 16.6% of the sample). Bantering communicators scored relatively high on six of the seven behaviors, but their embracing of new communication technologies was similar to that of participants in other profiles. With two exceptions, bantering communicators in this study were similar to bantering

communicators in previous research. In this study, bantering communicators were somewhat more likely than engaged communicators to report skepticism of anti-aging media and discuss future caregiving preferences. Gasiorek and Fowler (2016) previously found that engaged communicators scored slightly higher than bantering communicators on these two considerations. Nevertheless, bantering communicators' relatively high scores on these two considerations in this study seemed consistent with the *bantering* theme. The proportion of participants classified as bantering communicators in this study (16.6%) was lower than the proportion of bantering communicators in Gasiorek and Fowler's study (39.6%).

The fourth profile (comprising 14.7% of the sample) was labeled *disengaged-joking communicators about age-related issues*. In most respects, disengaged-joking communicators resembled disengaged communicators by scoring relatively low across the communication behaviors (i.e., relatively low levels of self-categorizing, expressed optimism, skepticism of anti-aging media, and discussions of future caregiving). However, disengaged-joking communicators differed from disengaged communicators in two important respects: Disengaged-joking communicators were relatively likely to collude in the teasing of others about age as well as play along when they are the subject of ageism or age-related humor. The disengaged-joking profile was a novel profile not observed in previous research.

Environmental Chatter as a Predictor of Own Age-Related Communication

H2 predicted that the environmental chatter profiles would be associated with the own age-related communication profiles. To test this hypothesis, we ran a latent transition analysis (LTA) in *Mplus* 7.3. LTA is most commonly used to examine changes in profile membership over time (e.g., the probability that engaged communicators about age-related issues remain engaged communicators over time, versus the probability that engaged communicators transition to disengaged, bantering, or disengaged-joking communicators over time). However, LTA can also be conducted with cross-sectional data to examine participants' probability of being a member of a certain profile in Series B, given their membership in a specific profile in Series A (see Bernhold, 2019). Table 2 reports all latent transition probabilities for an LTA in which the environmental chatter profiles constituted Series A and the own age-related communication profiles constituted Series B.

As illustrated in Table 2, grandchildren who experienced accommodative chatter seemed disproportionately likely to be engaged and disengaged communicators about age-related issues, as opposed to bantering or disengaged-joking communicators about age-related issues. More specifically, their probability of being an engaged or a disengaged communicator was more than double their probability of being a bantering or a disengaged-joking communicator.

Table 2. Latent Transition Probabilities Illustrating the Likelihood of Own Age-Related Communication Profile Membership, Given Environmental Chatter Profile Membership.

	Own age-related communication profile			
Environmental chatter profile	Engaged communicator	Disengaged communicator	Bantering communicator	Disengaged-joking communicator
Accommodative	.37	.36	.12	.16
Ambivalent	.25	.28	.23	.24
Mixed-accommodative	.31	.28	.26	.15

Bivariate correlations in Table 1 suggested similar findings to these LTA results.[2] As Table 1 shows, the probability of experiencing accommodative chatter was positively associated with the probability of being a disengaged communicator. The probability of experiencing accommodative chatter was negatively associated with the probability of being a bantering communicator.

Second, the LTA results in Table 2 suggested that grandchildren who experienced ambivalent chatter did not seem to disproportionately fall into a certain type of profile with respect to their own age-related communication. These grandchildren demonstrated approximately a .25 probability of being each type of communicator about age-related issues. Bivariate correlations in Table 1 suggested similar findings to these LTA results. As Table 1 shows, the probability of experiencing ambivalent chatter was not significantly associated with any of the own age-related communication probabilities.

Third, the LTA results in Table 2 suggested that grandchildren who experienced mixed-accommodative chatter seemed disproportionately likely to be engaged communicators about age-related issues rather than disengaged-joking communicators. More specifically, their probability of being an engaged communicator was more than double their probability of being a disengaged-joking communicator. Bivariate correlations in Table 1 suggested a complementary set of findings. As Table 1 shows, the probability of experiencing mixed-accommodative chatter was negatively associated with the probability of being a disengaged communicator about age-related issues and positively associated with the probability of being a bantering communicator.

Own Age-Related Communication and Environmental Chatter as Indirect Predictors of Well-Being

H3 predicted that relative to engaged communicators about age-related issues, all other own age-related communication profiles would be indirectly associated with lower life satisfaction, more depressive symptoms, and greater loneliness, via lower self-efficacy with respect to aging. H4 predicted that environmental

chatter would be indirectly associated with the three aspects of well-being, via self-efficacy with respect to aging. To test these hypotheses, we specified a path model in *Mplus* 7.3. Own age-related communication profile probabilities and environmental chatter profile probabilities were stipulated as parallel predictors of self-efficacy with respect to aging. Self-efficacy with respect to aging, in turn, was stipulated as a predictor of life satisfaction, depressive symptoms, and loneliness. To avoid redundant information in the model, it is necessary to designate one profile for each series as the reference profile and exclude that profile's probabilities from subsequent modeling. We designated engaged communicators as the reference profile for own age-related communication and accommodative chatter as the reference profile for environmental chatter. The eight covariates from the Method section were specified as predicting each communicative predictor and each well-being outcome. The model demonstrated acceptable fit, χ^2 (23) = 52.57, $p < .001$, comparative fit index = 0.96, root mean square error of approximation = .06, standardized root mean square residual = .02. The model explained 30.5% of the variance in life satisfaction, 20.8% of the variance in depressive symptoms, and 17.8% of the variance in loneliness. Table S2 in the online-only supplemental materials reports path coefficients for the model. Table 3 reports indirect associations (calculated by *Mplus*).

As shown in Table 3, relative to engaged communicators as the reference profile, disengaged-joking communicators demonstrated lower life satisfaction, more depressive symptoms, and greater loneliness, via lower self-efficacy with respect to aging. This finding partially supported H3. Relative to accommodative chatter as the reference profile, neither of the other two environmental chatter profiles were indirectly associated with well-being, leaving H4 unsupported.

Discussion

This study examined how grandparents' accommodation toward grandchildren predicts grandchildren's own age-related communication and well-being. It also considered how grandchildren's own age-related communication indirectly predicts grandchildren's well-being, via grandchildren's self-efficacy with respect to aging. Grandparents' patterns of accommodation toward grandchildren predicted grandchildren's own age-related communication. This finding is important because it helps delineate intergenerational dynamics that might place grandchildren on specific aging trajectories at relatively early periods of the life span (e.g., Giles et al., 2013). From a life course perspective (e.g., Allen et al., 2019), the links between grandparents' accommodative practices and grandchildren's own age-related communication suggest the merit of future longitudinal research probing the stability with which young and middle-aged

Table 3. Unstandardized Indirect Associations Between Communicative Predictors and Well-Being Outcomes, via Self-Efficacy With Respect to Aging.

	Outcome					
	Life satisfaction		Depressive symptoms		Loneliness	
	b (*SE*)	*p*	*b* (*SE*)	*p*	*b* (*SE*)	*p*
Probability of disengaged communicator about age-related issues	<0.01 (0.05)	.99	<0.01 (0.03)	.99	< 0.01 (0.04)	.99
Probability of bantering communicator about age-related issues	−0.11 (0.06)	.10	0.07 (0.04)	.10	0.08 (0.05)	.10
Probability of disengaged-joking communicator about age-related issues	**−0.17 (0.07)**	**.01**	**0.11 (0.04)**	**.01**	**0.13 (0.05)**	**.01**
Probability of ambivalent chatter	−0.01 (0.07)	.87	0.01 (0.04)	.87	0.01 (0.05)	.87
Probability of mixed-accommodative chatter	−0.08 (0.05)	.096	0.05 (0.03)	.098	0.06 (0.04)	.10

Note. Significant indirect associations appear in bold type.

adults continue to speak about aging in ways linked to the accommodation they received from grandparents during earlier periods of the life span.

Moreover, given that middle-aged adults' patterns of own age-related communication have predicted their mental well-being (Gasiorek et al., 2015), the links between accommodation from grandparents and grandchildren's own age-related communication suggest the merit of longitudinally exploring even more complex questions. For example, researchers can consider whether or not grandparents' accommodation toward young adult grandchildren serves as a distal predictor of grandchildren's well-being when grandchildren reach middle adulthood, via the successive links of grandchildren's age-related communication habits over time and grandchildren's self-efficacy with respect to aging (i.e., serial mediation). In the paragraphs that follow, we first elaborate on how grandparents' accommodation toward grandchildren predicted grandchildren's own age-related communication. We then discuss how grandchildren's own age-related communication indirectly predicted grandchildren's well-being.

Implications of Grandparents' Accommodation Toward Grandchildren

One of the main contributions of this study involved the explication of the accommodative, ambivalent, and mixed-accommodative profiles. Grandchildren who experienced accommodative chatter from grandparents

seemed disproportionately likely to be engaged or disengaged communicators about age-related issues. The accommodative profile was characterized by high levels of accommodation and low levels of overaccommodation and underaccommodation. Given that accommodation is typically construed as constructive and nonaccommodation is typically construed as destructive (Ota et al., 2007), grandchildren who experience accommodative chatter might be well-positioned to become engaged communicators about age-related issues as they learn how to proactively approach issues related to aging. For example, by not hearing their grandparents complaining about their health and other life circumstances (i.e., by experiencing low levels of underaccommodation from grandparents), grandchildren in accommodative chatter environments may likewise learn to avoid invoking age as an explanation or excuse for their shortcomings, which is one characteristic typical of engaged communicators. In this way, grandchildren may be using their grandparents as role models for how to communicate about aging (see Gasiorek et al., 2016). As another example, by receiving many compliments and much affection from accommodative grandparents, grandchildren may perceive their grandparents as generally joyful people, which may encourage grandchildren to view older adults as a whole and aging through an optimistic lens (see Harwood, Hewstone, Paolini, & Voci, 2005).

Experiencing accommodative chatter from grandparents might also facilitate disengaged tendencies for other young adults because the lack of overaccommodation and underaccommodation might make any potential difficulties associated with growing older (e.g., potential health difficulties) less salient for grandchildren, thereby allowing grandchildren to disengage from the aging process during young adulthood. Relatedly, grandchildren who receive accommodative chatter may be living relatively comfortable lives without many intergenerational tensions. This security and lack of intergenerational hostility may be conducive to not having to think and talk about age-related issues during young adulthood.

In contrast, grandchildren who experienced mixed-accommodative environments were more likely to be bantering communicators about age-related issues rather than disengaged communicators. Although grandchildren in mixed-accommodative environments received relatively high levels of accommodation, they also tended to receive relatively high levels of overaccommodation and underaccommodation compared to grandchildren in the accommodative profile. Most notably, grandchildren in the mixed-accommodative profile were the most likely to report that their grandparents complained about their lives, complained about their health, and frequently talked about their health. Previous work has shown how young adults often perceive their grandparents as role models for how to age (Jopp et al., 2017). Hearing grandparents complain about various aspects of their lives (e.g., health challenges they experience as they grow older) may suggest to grandchildren that they should also talk

about their age in various contexts, such as mentioning their age as a reason for events they are experiencing. Moreover, role models generally have to be liked before people imitate them (Bandura, 1986). By virtue of experiencing relatively high levels of accommodation from grandparents in mixed-accommodative environments, grandchildren may indeed like their grandparents and, thus, be motivated to act like them when it comes to discussing age-related issues.

Grandchildren who experienced ambivalent chatter scored near the scale midpoint (*neither agree nor disagree*) for many of the accommodation and nonaccommodation items. Several explanations may help account for these findings. Grandchildren in ambivalent environments may see their grandparents only rarely (e.g., on holidays), and grandparents may keep their discussions relatively superficial during these rare occasions. Thus, grandchildren may not experience meaningful accommodation or nonaccommodation one way or another from these grandparents. Consistent with this speculation, Bangerter and Waldron (2014) found that some long-distance grandparents reported consistently low or consistently moderate relational closeness with grandchildren, which may be because distance hinders the two parties from engaging in meaningful interactions. Another possibility is that grandchildren in ambivalent environments regularly interact with grandparents, but do not know how to interpret grandparents' communication. For example, grandchildren may be unsure whether to interpret their grandparents talking about hardships in their lives as accommodative self-disclosures that help build relational solidarity or as underaccommodative self-disclosures that they would prefer to not hear. Future researchers should probe the extent to which these explanations resonate with the lived experiences of grandchildren in ambivalent environments.

It is also worth considering why the ambivalent profile did not predict own age-related communication or the three variants of well-being. By experiencing ambivalence with respect to their grandparents' communication, grandchildren may be left with no clear blueprint for how they themselves should communicate about age-related issues. However, this ambiguity may not necessarily be constructive, as grandchildren who experienced ambivalent chatter seemed the most likely to be disengaged-joking communicators about age-related issues compared to grandchildren who experienced accommodative or mixed-accommodative chatter (see the last column of Table 2). If grandchildren only interact with grandparents during special occasions such as holidays, the ambivalent chatter profile might not be consequential enough to indirectly predict the three variants of well-being, via self-efficacy with respect to aging. Conversely, the ambivalent chatter profile might indirectly predict well-being if grandchildren regularly interact with grandparents. Future researchers would benefit from including a measure assessing the frequency with which grandchildren interact with grandparents. This variable might be positioned as a moderator

between the ambivalent profile and self-efficacy with respect to aging, with stronger negative associations expected for grandchildren who frequently interact with grandparents as opposed to grandchildren who infrequently interact with grandparents.

Although the environmental chatter profiles were not indirectly associated with well-being, via self-efficacy with respect to aging, they were associated with well-being at the bivariate level (see Table 1). More specifically, grandchildren who experienced accommodative chatter were more likely to report high life satisfaction and were less likely to report that they were experiencing depressive symptoms and loneliness. Conversely, grandchildren who experienced mixed-accommodative chatter were more likely to report that they were experiencing depressive symptoms and loneliness. These bivariate correlations offer preliminary evidence that self-efficacy with respect to aging might not always mediate the associations between environmental chatter and well-being. Future researchers are encouraged to design standalone studies that probe whether or not self-efficacy with respect to aging is a necessary construct in explaining the associations between communication and well-being.

Implications of Grandchildren's Own Age-Related Communication

Another study contribution involved the replication of the engaged, disengaged, and bantering profiles. However, the profiles operated somewhat differently in this study compared to previous research. The disengaged and bantering profiles (relative to the engaged profile) were not indirectly associated with life satisfaction, depressive symptoms, or loneliness, via self-efficacy with respect to aging. At least two explanations might help account for these findings. First, grandchildren's disengaged and bantering tendencies may have yet to fully solidify as routine and influential aspects of their lives by virtue of grandchildren still being young adults. As Gasiorek et al. (2019, p. 18) recently argued, thoughts and feelings about aging likely become "calcified" after many years and decades of observing certain forms of environmental chatter and engaging in certain forms of own age-related communication. If true, the disengaged and bantering communicators in this study may be in the midst of their formative years of developing engrained habits of age-related communication, and, as such, the disengaged and bantering tendencies might become increasingly detrimental as grandchildren age into later periods of their life span.

A second potential explanation is that the bantering profile in this study was somewhat different than the bantering profiles of previous research. Although this study's bantering communicators resembled bantering communicators from previous research in most respects (e.g., relatively high levels of teasing others about age), bantering communicators were different in two respects. Unlike previous studies (e.g., Gasiorek & Fowler, 2016), bantering communicators in

this study were somewhat more likely than engaged communicators to report skepticism of anti-aging media and discuss future caregiving preferences. These two communicative tendencies are generally regarded as conducive to well-being (e.g., Pinquart & Sorensen, 2002) and, as such, might have contributed to a healthier overall bantering profile compared to the bantering profiles of previous research.

Nevertheless, own age-related communication may be consequential for grandchildren's well-being in other ways. More specifically, relative to engaged communicators about age-related issues, disengaged-joking communicators reported lower life satisfaction, more depressive symptoms, and greater loneliness, via lower self-efficacy with respect to aging. The emergence of a disengaged-joking profile and its indirect associations with multiple variants of well-being are noteworthy in several respects. First, with one exception (Gasiorek & Fowler, 2016), all CEMSA research has previously examined own age-related communication profiles with samples of middle-aged and older adults. Gasiorek and Fowler's (2016) study on young adults did not uncover a disengaged-joking profile, whereas this study did. Because only two studies have utilized samples of young adults, more research is needed before any definitive conclusions can be made about the disengaged-joking profile's stability. Second, the disengaged-joking profile seems conceptually coherent: It makes sense that there would be a subset of young adults who generally do not speak about age-related issues, except when it comes to making jokes about others' age, playing along when their age is the subject of jokes, and keeping up with new communication technologies.

Third, Arnett (2000) characterizes emerging adulthood (i.e., the period between ages 18 and 25 years) as a time of feeling in-between adolescence and adulthood, experiencing cognitive and affective instability, and exploring one's identity. Some emerging adults may also be undergoing a sociolinguistically formative point in their lives in which they are learning to use their voices instead of defaulting to their previous patterns of timidity (Brook, Jankowski, Konnelly, & Tagliamonte, 2018). Applied to this study, disengaged-joking communicators may be starting to form their identity as adults by voicing their amusement about what it means to grow older through teasing others about age and playing along when their own age is the subject of jokes. The CEMSA cautions about the potential dangers of age-related humor (see Fowler et al., 2015). This study's findings suggest that age-related humor, when accompanied by a larger ecology characterized by disengagement from communicating about other aspects of aging, may indeed be detrimental to the realization of well-being for young adults in this formative period of the life span. Future researchers might consider employing discourse analysis and other methods that examine the actual enactment of age-related humor through language and nonverbal cues (see Giles, 2019; Giles, Bourhis, Gadfield, Davies, & Davies, 1976).

Limitations and Additional Opportunities for Future Research

In addition to the research directions discussed in the previous section, this study also contains limitations that suggest avenues for future research. First, causality cannot be established from these cross-sectional data. The tested associations were in directions consistent with previous CEMSA scholarship, but future longitudinal research will add additional insight into the temporal order of variable interrelationships and other conditions necessary for causality. Second, grandchildren reported on a specific grandparent of their choosing, which was consistent with procedures in past research (e.g., Kam & Hecht, 2009). However, this procedure may have resulted in grandchildren disproportionately reporting on their closest grandparent. Relatedly, grandchildren more often reported on a grandmother rather than a grandfather. Although we situated both parties' sex as control variables, future researchers could explore how gender norms might play more substantive roles in the CEMSA's proposed relationships. Future researchers could also randomly assign grandchildren to report on a specific grandparent, with random reassignment for grandchildren initially assigned to a deceased grandparent. This alternative procedure might illuminate additional chatter profiles, such as a profile characterized by lower levels of accommodation and higher levels of nonaccommodation.

Another opportunity for future research is to probe how *grandparents* experience accommodative and nonaccommodative chatter from grandchildren and the implications of such chatter on grandparents' well-being. Future researchers could also consider the role of the middle generation (i.e., grandchildren's parents) as part of grandchildren's environmental chatter, either by asking grandchildren to report on the accommodation they receive from parents or including parents' perspectives in dyadic or family-level studies. Finally, this study focused on a subset of relationships in the CEMSA (see Figure 1); future researchers should continue exploring how environmental chatter and own age-related communication are related to uncertainty and affect about aging.

Conclusions

This study applied the CEMSA to intergenerational family relationships and examined grandchildren's well-being (namely, life satisfaction, depressive symptoms, and loneliness). Grandchildren's experiences of receiving accommodation, overaccommodation, and underaccommodation from grandparents had implications for how grandchildren communicate about age-related issues. Grandchildren who received accommodative chatter seemed especially likely to be engaged or disengaged communicators about age-related issues, whereas grandchildren who received mixed-accommodative chatter seemed especially

likely to be bantering communicators about age-related issues. The links between environmental chatter from grandparents and grandchildren's patterns of own age-related communication illustrate the interdependence of family life (see Yoshimura & Galvin, 2018) and show the merit of applying the CEMSA to family relationships. Future researchers might continue to examine how parents and grandparents influence grandchildren's patterns of age-related talk and well-being. Moreover, relative to engaged communicators about age-related issues, disengaged-joking communicators reported lower life satisfaction, more depressive symptoms, and greater loneliness, via lower self-efficacy with respect to aging. The disengaged-joking profile might be especially problematic in positioning young adults on unfavorable aging trajectories and, as such, also warrants sustained attention in future research.

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Notes

1. The full data set is available upon request from the first author via e-mail.
2. For each participant in the data set, *Mplus* yields continuous probabilities of falling in each latent profile when conducting LPAs. The environmental chatter and own age-related communication profile probabilities in Table 1 were all on continuous scales ranging from 0.00 to 1.00. Thus, significant bivariate correlations between an environmental chatter profile and an own age-related communication profile in Table 1 speak to how the probability of falling into a certain environmental chatter profile is systematically associated with the probability of falling into a certain own age-related communication profile.

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Article

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Subjective Age and Memory Performance Among Older Chinese Adults: A Moderated Mediation Model

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Abstract

This study aims to examine the mediating role of learning self-efficacy in the relationship between subjective age and memory performance as well as the moderating role of education in these indirect and direct relationships. A study was conducted with 200 older adults aged 60 to 81 years who completed measures of subjective age, learning self-efficacy, education, and memory performance. Analysis revealed that learning self-efficacy partially mediated the association between subjective age and memory performance. Further analysis found that the indirect associations between subjective age and memory through learning self-efficacy vary as a function of education. Implications and suggestions for future research are discussed.

Keywords

subjective age, self-efficacy, education, memory performance

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Introduction

Memory functioning and other cognitive functioning are essential components of successful aging with strong implications for engaging in daily activities (Zahodne, Manly, Mackaybrandt, & Stern, 2013), maintaining independence and health-related quality of life in older adults (Seeman, Lusignolo, Albert, & Berkman, 2001). A careful scrutiny of the influence factors and relevant mechanisms for memory performance is needed to enable prevention and intervention efforts. Typically, chronological age, a natural marker of biological basis, is a powerful predictor of memory performance in the normal aging process (Singh-Manoux et al., 2012). In recent years, a growing interest has been directed toward subjective age and its potential effects on memory performance among older adults (Stephan, Caudroit, Jaconelli, & Terracciano, 2014; Stephan, Sutin, Caudroit, & Terracciano, 2015). This study mainly focused on the underlying mechanisms between subjective age and memory performance, which may provide more valuable insights about mechanisms involved in memory functioning among older adults.

Subjective Age and Memory Performance

Subjective age, how young or old individuals perceive themselves to be, is a central component of the aging self. There is accumulating evidence suggesting that majority of older adults feel younger than they actually are (see review by Kotter-Grühn, Kornadt, & Stephan, 2016), which are usually considered an important protective strategy (Weiss & Lang, 2012) and a predictor of markers of successful aging (Choi & Dinitto, 2014; Kotter-Grühn et al., 2016; Montepare, 2009; Stephan, Caudroit, & Chalabaev, 2011). Until recently, some researchers have begun to pay attention to the close association between younger subjective age and memory performance among older adults (Schafer & Shippee, 2010; Stephan et al., 2014, 2015). For instance, studies by Stephan et al. (2014, 2015) found that younger subjective age was associated with better memory performance and slower decline in immediate recall, delayed recall, and global memory functioning. The implicative value of subjective age may differ cross-culturally (Kotter-Grühn et al., 2016; Westerhof & Barrett, 2005). A younger subjective age is typically regarded as a self-protective strategy to resist or reject the threat of on their self-esteem when exposed to negative aging stereotypes (Teuscher, 2009; Weiss & Lang, 2012). Therefore, it is meaningful to explore the relationship between subjective age and memory performance among Chinese older adults in the culture of filial piety.

Subjective Age, Learning Self-Efficacy, and Memory Performance

Despite the finding that individuals who feel younger than their chronological age report better memory performance, such as immediate and delayed recall

(Stephan et al., 2014, 2015), few studies so far have focused on the mechanisms through which subjective age could affect memory functioning (Kotter-Grühn et al., 2016). To our knowledge, only the recent studies by Stephan et al. (2014, 2015) have confirmed the mediating role of BMI, frequency of physical activity, or depressive symptoms between younger subjective age and memory performance. However, as these mediators can explain only part of the relationship between subjective age and memory, one possibility is that subjective age drives processes that have a more proximal influence on memory performance (Stephan et al., 2014, 2015). Thus, further research is needed to explore other potential pathways, which may explain the association between subjective age and memory outcomes, such as learning self-efficacy.

As an extension of the self-efficacy theory (Bandura, 1997), learning self-efficacy can be defined as the beliefs about one's ability to learn effectively to attain certain desired goals in different situations (Tang & Wang, 2012). These efficacy beliefs allow individual to accept challenging tasks, readily participant in cognitive activities, use self-regulatory strategies, and exhibit extensive cognitive processing and persistence. There is evidence suggesting that a higher level of self-efficacy probably contributes to motivation effects in the case of cognitive challenges, resulting in better cognitive performance (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Hertzog & Hultsch, 1998; McDougall, 2009; Schafer & Shippee, 2010). When an individual does not develop sufficient level of perceived self-efficacy, he will not exert enough effort to achieve the cognitive results. In this vein, older adults often require more time to learn new materials and also are likely to have less confidence in their ability to learn new materials. Therefore, a decrease in learning self-efficacy may prevent many individuals from pursuing higher cognitive performance, including memory performance (Fisk & Warr, 1996).

Researchers have argued that subjective age may well act as an antecedent of self-efficacy beliefs, rather than serving only as an outcome (Infurna, Gerstorf, Robertson, Berg, & Zarit, 2010). There is empirical evidence that older adults with younger subjective ages are likely to have higher levels of general self-efficacy belief (Teuscher, 2009). In contrast, the older subjective age was prospectively related to a more pessimistic disposition about their ability to maintain memory performance (Schafer & Shippee, 2010). Similarly, a study by Stephan et al. (2011) has demonstrated that subjective age, as a self-enhancing positive illusion, has strong implications for older adults' memory self-efficacy. Based on the model of information processing, learning and memory are closely connected in cognitive processing because learning necessarily entails acquisition, storage, and retrieval (Zimprich, Rast, & Martin, 2008). Considering the common underlying mechanisms (Zimprich et al., 2008) and neural basis (Okano, Hirano, & Balaban, 2000) that learning shares with memory, it is more likely that an older subjective age may be related to lower confidence in one's ability to learn effectively among older adults. Taken

together, we assume that learning self-efficacy may play a mediating role between subjective age and memory performance.

Education as a Moderator

Although older subjective age may impact older adults' memory performance through the mediating role of perceived self-efficacy, not all older adults who have older subjective age homogeneously experience decreased self-efficacy and report a worse memory performance. This heterogeneity of outcomes may be contingent upon individual characteristics that moderate the impact of older subjective age on self-efficacy and memory performance, such as education. According to cognitive reserve theory (Stern, 2002), educational attainment is typically identified as a protective factor in cognitive aging or cognitive impairment. As an important interindividual variability, education is likely to buffer the detrimental effect of older subjective age on learning self-efficacy, because education may help develop a wider repertoire of cognitive strategies and the best use of these strategies to assist performance in various memory tasks (Angel, Fay, Bouazzaoui, Baudouin, & Isingrini, 2010). When exposed to older subjective aging situations, older adults with high educational level may produce some new cognitive strategies to counter adverse effects of negative age stereotypes, age-related fears, and stigmas. In this vein, older adults with high educational level may tend to believe they have the ability to learn and memorize new materials (Tang & Wang, 2012), so the detrimental effect of older subjective age on memory through self-efficacy may be greatly reduced or disappeared. In addition, prior studies have shown that education plays a moderating role between chronological age and cognitive aging (Anstey, Hofer, & Luszcz, 2003; Gao, Peng, Wen, & Wang, 2011; Von Gunten et al., 2008). As subjective age is highly correlated with chronological age (Henderson, Goldsmith, & Flynnm, 1995), we hypothesize that the indirect effect of subjective age on memory performance through learning self-efficacy may be moderated by education (first-stage moderation).

The Present Study

This study proposes a moderated mediation model, aimed at examining the direct/indirect relationship between subjective age and memory performance among older Chinese adults. The purpose of this study is twofold: (a) to test whether learning self-efficacy mediates the relationship between older subjective age and lower level of memory performance and (b) to examine whether the direct and indirect associations between subjective age and memory performance through learning self-efficacy are moderated by education. Figure 1 illustrates the conceptual model applied. Specifically, based on the literature, this study proposed the following hypotheses: (H_1) older subjective age is negatively

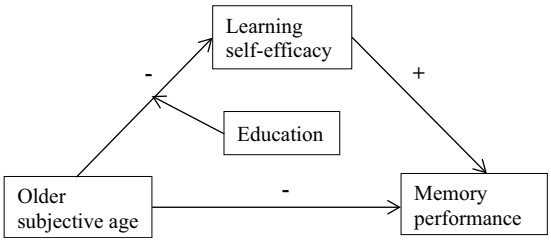

Figure 1. The proposed moderated mediation model.

associated with memory performance; (H_2) learning self-efficacy mediates the relationship between older subjective age and memory performance; and (H_3) education attenuates the path between older subjective age and memory performance through learning self-efficacy (first-stage moderation). The answers to these questions would be critical to advance our understanding of memory aging as well as to develop effective interventions to decrease the negative effects of memory level.

Methods

Participants

A total of 210 older adults aged 60 years or above were recruited using the convenient sampling method from the Chongqing and Sichuan communities in China. Ten participants were excluded from the analyses because they had incomplete variables of interest and because of multivariate outliers (±3 standard deviations). The final sample consisted of 200 older Chinese adults, aged 60 to 81 years ($M = 65.42$, $SD = 5.60$, 133 women and 67 men). In terms of educational attainment, 16.5% had an primary school education, 55.0% junior middle school, 21.0% high school, and 7.5% a junior college or above. Up to 82% of the participants had a partner (i.e., were married, lived as couples).

Data Collection Procedures

All the participants signed a consent form approved by the Institutional Review Boards of the corresponding author's institution. The investigation was conducted by primary investigators, and all the participants were assessed individually in quiet rooms in a psychological laboratory or a community center at prearranged times. Following the experimental procedures developed by Ofstedal, Fisher, and Herzog (2005), all the participants completed a multisection questionnaire, including demographic variables, subjective age, and learning self-efficacy. Next, they were asked to perform the memory task. One of four possible lists of 10 words was randomly assigned to participants. They had

1 minute to study the list, followed by an immediate recall test. The average time required to complete the questionnaires was 40 minutes. The participants were offered a gift after the study materials were completed.

Measures

Subjective age. According to previous research (Mock & Eibach, 2011; Rubin & Berntsen, 2006; Stephan et al., 2015; Westerhof & Barrett, 2005), felt age was assessed by asking participants to specify, in years, how old they felt. Participants' chronological age was subtracted from their felt age, and the obtained difference scores were divided by chronological age, thereby obtaining proportional discrepancy scores (Mock & Eibach, 2011). A positive value indicated an older subjective age, and a negative value indicated a younger subjective age.

Memory performance. Immediate word recall was used in this study to measure older adults' memory functioning. The experimental materials were developed by Ofstedal et al. (2005), which were widely used in the Health and Retirement Study, and the Chinese version of the experimental materials adapted by Wu (2016). A list of 40 highest frequency words (e.g., work, life, country) was extracted from *Modern Chinese Frequency Dictionary*. According to their frequency of occurrence in daily life, these words were divided into four different lists in order to administer different lists to participants in the same household or community. The results of variance analysis indicated no significant difference in frequency among the four lists, $F(3, 36) = 0.283$, $p > .05$. One of four possible lists was randomly assigned to the participants, and the participants were asked to recall as many words as possible from the list in any order. The number of correctly recalled words was indicated as the index of older adults' memory scores.

Learning self-efficacy. The Learning Self-efficacy Subscale of Intellectual Self-efficacy Scale by Tang and Wang (2012) was used to measure older adults' perceived self-efficacy for learning cognitive tasks. This subscale includes five items, such as "I'm dying to learn something new." The participants were required to indicate their agreement with the items on a 6-point scale (ranging from 1 = *strongly disagree* to 6 = *strongly agree*). Higher scores indicate a higher level of perceived self-efficacy in learning. Cronbach's α had a value of .76 in this study.

Education. We measured education on a 4-point scale (1 = *primary school*, 2 = *junior middle school*, 3 = *high school*, and 4 = *junior college or above*). Educational level was reported by the participants. Taking into account the overall educational level of Chinese older adults based on the data of sixth

National Census (Zhang, 2016) and previous research (Gao et al., 2011), we converted this variable into two categories: "less than high school" and "high school or above." Educational level was dummy coded such that 0 was assigned *less than high school* and 1 was assigned *high school or above*.

Covariates

According to previous studies (Kotter-Grühn et al., 2016; Stephan et al., 2014, 2015), demographic covariates were age, gender (coded as 0 for men and 1 for women), marital status (coded as 0 for *in marriage* and 1 for *single*), self-rated health, and physical health (i.e., the number of chronic conditions). Self-rated health was assessed by a single question (i.e., in general, would you say that your health is excellent, very good, good, fair, or poor) with a Likert-type answering scale ranging from 1 (*poor*) to 5 (*excellent*). Of the participants, 1% indicated poor, 13.5% fair, 57% good, 26% very good, and 2.5% excellent. In addition, the number of chronic conditions ($M = 1.68$, $SD = 0.75$) was assessed using the Self-administered Comorbidity Questionnaire (Sangha, Stucki, Liang, Fossel, & Katz, 2013), which refers to the presence of heart disease, high blood pressure, diabetes, and so on.

Data Analysis

We first presented descriptive statistics and bivariate correlations for variables of interest and control variables using SPSS 22.0. Second, we examined whether the mediation process was moderated by education. The analysis of moderated mediation model was performed using Hayes' PROCESS macro (Hayes, 2013), which has been used to examine whether the magnitude of a mediation effect is conditional on the value of a moderator. The bootstrapping method produces 95% bias-corrected confidence intervals (CIs) of these effects from 5,000 resamples of the data (sample size = 200). CIs that do not contain zero indicate significant effects.

Results

Preliminary Analysis

Descriptive statistics (means and standard deviations) and Pearson's correlation coefficients among all study variables are presented in Table 1. On average, older adults reported feeling 11% younger than their chronological ages, and approximately 75.5% of the participants felt younger than their chronological ages. Moreover, 19.5% felt the same age as their chronological ages, and only 5% felt older than their chronological ages. The correlation matrix showed that older subjective age was negatively associated with memory performance ($r = -.19$, $p < .01$), thereby supporting hypothesis (H_1). Older subjective age

Table 1. Means, Standard Deviations, and Correlation Matrix ($N = 200$).

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Gender	0.67	0.47	–								
2. Chronological age	65.42	5.60	−0.33**	–							
3. Marital status	0.18	0.39	0.20**	−0.13	–						
4. Chronic conditions	0.68	0.76	−0.05	0.32**	0.01	–					
5. Self-rated health	3.16	0.72	−0.02	0.02	−0.08	−0.35**	–				
6. Subjective age[a]	−0.11	0.11	−0.10	0.23**	−0.07	0.17*	−0.12	–			
7. Learning self-efficacy	4.20	1.09	−0.16*	0.01	−0.09	0.03	0.16*	−0.21**	–		
8. Education	0.29	0.45	−.14	0.07	−0.15*	0.08	0.05	−.13	0.22**	–	
9. Memory performance	6.22	2.04	−0.05	−0.12	−0.10	0.06	0.02	−0.19**	0.23**	.28**	–

[a]Higher values represent older subjective age. Gender was dummy coded such that 0 = *male* and 1 = *female*. Marital status was dummy coded such that 0 = *in marriage* and 1 = *single*.
*$p < .05$. **$p < .01$.

Table 2. Moderating Role of Education.

	Learning self-efficacy			Memory performance		
	β	t	95% CI	β	t	95% CI
Subjective age	−0.18*	−2.53	(−0.32, −0.04)	−0.15*	−2.13	(−0.29, −0.01)
Learning self-efficacy				0.20**	2.88	(0.06, 0.34)
Education	0.38*	2.44	(0.07, 0.68)			
Subjective age × Education	0.33*	2.12	(−0.32, −0.04)			
R^2	0.15			0.08		
F	4.23***			8.03***		

CI = confidence interval.
*$p < .05$. **$p < .01$. ***$p < .001$.

was negatively associated with the level of learning self-efficacy ($r = -.21$, $p < .01$), while learning self-efficacy was positively related to memory performance among older adults ($r = .23$, $p < .01$).

Testing for Mediation Effect

The PROCESS macro developed by Hayes (2013) was used to examine the mediating role of learning self-efficacy between older subjective age and memory performance. The bias-corrected bootstrap method showed that the indirect effect of subjective age on memory performance through learning self-efficacy was significant with the index of the mediation effect being −.04 (95% CI = [−0.10, −0.01]), and the mediation effect accounted for 20% of the total effect. Furthermore, the direct effect of subjective age on memory performance was also significant ($\beta = -0.15$, $t = -2.09$, 95% CI = [−0.29, −0.01], $p < .05$). Therefore, the relationship between subjective age and memory performance was partially mediated by learning self-efficacy, supporting Hypothesis (H_2).

Testing for Moderated Mediation: Education

The PROCESS macro developed by Hayes (2013) was conducted to test the proposed moderated mediation model. Specifically, we estimated the moderating effect of education on the relationship between older subjective age and memory performance (first-stage moderation), controlling for relevant covariates. The specifications of the models are provided in Table 2. There was a significant effect of older subjective age on learning self-efficacy ($\beta = -0.18$, $t = -2.53$, 95% CI = [−0.32, −0.04], $p < .05$), and a significant interaction of subjective age and education on learning self-efficacy ($\beta = 0.33$, $t = 2.12$, 95% CI = [−0.32, −0.04], $p < .05$). The effect of older subjective age on memory performance was also significant ($\beta = -0.15$, $t = -2.13$, 95% CI = [−0.29, −0.01],

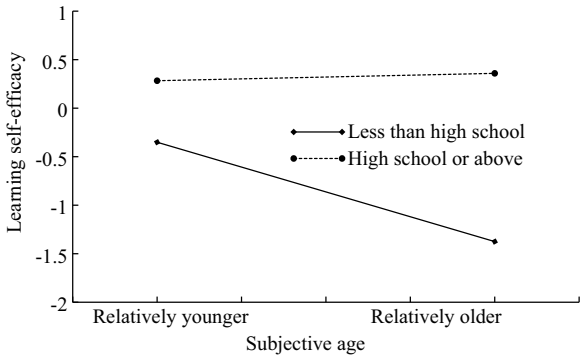

Figure 2. The interaction effect of older subjective age and education on learning self-efficacy.

$p < .05$), and learning self-efficacy was positively associated with memory performance ($\beta = 0.20$, $t = 2.88$, 95% CI = [0.06, 0.34], $p < .01$).

The bias-corrected percentile bootstrap method further indicated that the indirect effect of older subjective age on older adults' memory performance via learning self-efficacy was moderated by education (index of moderated mediation= 0.07, $SE = 0.04$, 95% CI = [0.01, 0.18]). For older adults with low education, older subjective age had a detrimental effect on memory performance through decreased learning self-efficacy (point estimate = −0.06, $SE = 0.03$, 95% CI = [−0.13, −0.01]), accounting for 27% of the total effect. In contrast, the indirect effect was not significant for older adults with high educational level (95% CI = [−0.04, 0.08]). Thus, learning self-efficacy partially mediated the relationship between subjective age and memory performance, and this mediating role of learning self-efficacy was moderated by education (first-stage moderation).

According to Aiken and West (1991), we plotted predicted learning self-efficacy against older subjective age separately for low and high levels of education (lower than high school and high school or above, respectively; Figure 2). Simple slope tests indicated that for older adults with low educational level, relatively older subjective age was associated with lower levels of learning self-efficacy ($\beta_{\text{simple}} = -0.26$, $t = -3.09$, $p < .01$). However, for older adults with high educational level, the effect of relatively older subjective age on learning self-efficacy was not significant ($\beta_{\text{simple}} = 0.02$, $t = 0.13$, $p > .05$).

Discussion

This study found that the subjective experience of aging, as indexed by how old or young an individual feels, significantly associates with older adults' memory performance beyond chronological age and other risk factors for memory level, which provided empirical support for the subjective age bias and its implication

in a non-Western culture. More importantly, our study for the first attempts to examine the mediating role of learning self-efficacy and the moderating role of education between older subjective age and memory performance. Our finding may add to the literature by clarifying *how* and *for whom* subjective age is associated with memory outcomes, providing clear valuable insights about the mechanisms involved in memory performance in old age.

This study revealed that older adults who feel older than their chronological age were more likely to show worse memory performance, regardless of their chronological age, which is consistent with and extends the findings of previous studies on the potential of alternative ways of measuring development time to explain older adults' cognition aging (Stephan et al., 2015). It suggested that subjective evaluations of age may be one of reliable indictors of dispositions toward memory performance. A further analysis revealed that perceiving a higher age than actual age is associated with decrease in confidence in one's ability to use his or her learning effectively in memory situations, which in turn is related to lower memory performance. This finding is consistent with other literature (Desrichard & Köpetz, 2005). That is, decreased in learning self-efficacy may be one of the explanatory mechanisms for why older adults who feel older are more likely to experience lower memory performance. Moreover, our finding supports the self-efficacy theory (Bandura, 1997), which posits that self-efficacy is an important resource and has beneficial motivational effects in the context of cognitive challenges through motivational, cognitive, and affective intervening process, resulting in higher cognitive performance. An individual's beliefs about his or her capabilities to exercise control over events that affect one's lives is the most important and pervasive mechanism of personal agency. Older adults who feel older than their actual ages may hold more negative attitudes towards themselves, deny a sense of control and mastery over life, and doubt their ability to learn new materials, which in turn may affect their efforts, involvement, and perseverance when faced with difficulties, obstacles, or failures. Poor task performance may be the final consequence. For example, Hertzog and Hultsch (1998) found that older adults with lower learning self-efficacy may be unlikely to use effortful but effective strategies, may not attempt to learn new strategies that would otherwise compensate for memory problems, and may also set lower goals for learning something new. Therefore, feeling older may decrease memory performance because it may destroy the self-evaluations in learning domains that could result in some self-limited actions that further reduce memory competence and performance.

Does feeling older necessarily entail experiencing worse memory performance through the leaning self-efficacy? Our study indicated that the indirect associations between subjective age and memory performance through learning self-efficacy vary as a function of older adults' educations. Specifically, the indirect effect through learning self-efficacy was only significant in older adults with low educational level, while subjective age was no longer associated with learning

self-efficacy in older adults with high educational level. Our findings add weight to the cognitive reserve hypothesis of cognitive aging by Stern (2002), which holds that some individual characteristics such as education could buffer the detrimental effects of the aging on cognitive abilities. The possible explanation for the protective effect of education is that education may help develop a broad repertoire of strategies, good vocabulary abilities, and a high level of learning, especially in the domain of memory (Angel et al., 2010; Anstey & Christensen, 2000). Furthermore, education typically involves better crystalized intelligence, working memory, processing speed, and mental states (Anstey & Christensen, 2000). In addition, older adults with higher education may be more likely to engage and persist in some intellectually stimulating activates such as reading/writing, surfing the Internet, handwork, and social activities. For example, previous study has revealed that individuals with higher education may have good performance in self-efficacy, cognitive capability, coping style, and health-related behavior (Koster et al., 2006). In this way, the detrimental effect of older subjective age on leaning self-efficacy was counteracted for older adults with high educational level. Therefore, education seems to be a protective factor that can buffer the deleterious effect of older subjective age on older adults' memory performance.

However, several limitations should be considered when evaluating the study findings. First, this study used a unidimensional measure of subjective age by asking individuals how old they are. However, scholars have identified the multidimensionality of subjective age construct, such as felt age, look age, act age, and interest age (Kastenbaum, Derbin, Sabatini, & Artt, 1972). Future studies should pay more attention to the multidimensionality of subjective age and explore whether the specific subjective age dimension contributes to memory performance. Second, this study focused only on leaning self-efficacy which can explain only part of the association between subjective age and memory performance, so other potential mediators need to be considered, such as memory self-efficacy. In addition, future studies should also pay more attention to other demographic and psychological variables including income and personality that may impact the outcomes, for previous studies indicating that these variables may influence the aging process (Kim & Kim, 2014, 2016, 2018). Third, owing to the cross-sectional nature of this study, we cannot make any causal inferences about the relationship of subjective age and memory performance. Further studies should use prospective design to better pinpoint the mechanism in the theoretical model.

Despite these limitations, this study supports subjective age as a potential alternative marker of development time and associates with memory aging in older adults. These findings have revealed that learning self-efficacy may serve as one potential mechanism by which subjective age is associated with memory outcomes. Moreover, it addresses the critical issue of "what works for whom," revealing that the mediation mechanism was moderated by education, and the

adverse impact of older subjective age on memory performance through decreased learning self-efficacy appears significant only for older adults who have less than high school level of education. Our findings may provide insights into the mechanisms underlying the relationship between older subjective age and memory performance among older adults and demonstrate the importance of a moderated mediation model.

Declaration of Conflicting Interests

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Article

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Depression and Quality of Life in Older Gay and Bisexual Men in Spain and Portugal

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Abstract

The purpose of this study was to assess levels of depressive symptoms and quality of life in older gay and bisexual older Spanish and Portuguese men and explore associations between these two samples and these variables. Using online surveys, 191 older gay and bisexual men from Spain and Portugal (mean age = 70 years) completed the Spanish and Portuguese versions of the Center for Epidemiologic Studies—Depression Scale and World Health Organization Instrument to Assess Quality of Life. Overall, moderate levels of depression and quality of life were found. Gay men and Spanish men report higher levels of depressive symptoms than bisexual and Portuguese men. Gay men score higher on physical health dimensions; bisexual men score higher on the social relationships dimension. Lower levels of physical health, psychological symptoms, and social relationships were significant predictors of depressive symptoms. These exploratory findings offer both similarities and differences between the samples from the two countries—and with U.S. data—and further evidence of the pervasive experience of depression in the lives of sexual minority older men with a renewed awareness of myriad contexts within which individuals age.

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depression, quality of life, aging, gay and bisexual older men, Spain and Portugal

Introduction

The aging Lesbian, Gay, Bisexual and Transgender (LGBT) communities are growing in visibility throughout the western world. Estimates of the numbers of LGBT persons are hampered by the absence of census or generalizable data (Choi & Meyer, 2016); still, in the United States, estimates of the numbers of LGBT persons aged 50 years and older range from 2.4 million to 4 million persons (Administration on Aging, 2014; Fredriksen-Goldsen, Kim, Shiu, Goldsen, & Emlet, 2015). Framed in another way, recent estimates suggest that 4.5% of LGBT adults identify as LGBT—increasing a full percentage point since 2012 (Gallup, 2018). The numbers of LGBT persons in other western nations are not as readily available, though a Dalia (2016) poll found that 5.6% of Europeans identify as LGBTQ. (It is interesting to note that, in an earlier Dalia pool, the percentage of European respondents who identified as *not only heterosexual* was twice as high as those who identified as LGBTQ; perhaps this difference comprises bisexuality, but some of this difference might also be language, customs, culture, and politics.)

Somewhat more thoroughly studied has been the psychosocial experiences of LGBT adults, although the understanding of transgender experiences is uneven and lags behind (Choi & Meyer, 2016). Overall LGB older persons, relative to heterosexual older adults, report poorer mental health and greater mental distress (e.g., Wallace, Cochran, Murazo, & Ford, 2011). For older LGB adults, there is an estimated 29% likelihood of presenting clinically significant depressive symptomatology (Fredriksen-Goldsen et al., 2013). Among these groups, gay men, especially, tend to experience even higher rates of depression (Cochran, Sullivan, & Mays, 2003).

Depression, particularly untreated, has a negative impact on quality of life (Chapman, Perry, & Strine, 2005; Fiske, Wetherell, & Gatz, 2009); several studies show that social support and interpersonal interactions are protective factors that decrease levels of depression and increase overall levels of quality of life (Wight, LeBlanc, de Vries & Detels, 2012). Findings add further evidence of the importance of friends, neighbors, and relatives in providing social support to LGB older adults (de Vries & Megathlin, 2009), particularly when predicting higher levels of mental health (lower levels of depression and anxiety) and quality of life (Masini & Barrett, 2008).

Symptoms of depression can compromise health in many ways among LGB older adults, including health-care engagement. Knowing this information may be helpful to provide screening for potential depressive symptomatology within both primary care and community aging-related service settings, as well as to

develop and offer necessary interventions that aim to promote both mental health well-being and health-care engagement among this vulnerable and growing population (Shiu, Kim, & Fredriksen-Goldsen, 2017).

Little research has focused on the study, the experience of depression, and quality of life among Southern European gay and bisexual men, such as Spain and Portugal. Both countries have transitioned, much like the United States, from repressive and exclusive environments for LGBT persons to more accepting and inclusive ones. Currently, both Spain and Portugal have marriage equality, gender identity transition recognition, nondiscrimination statutes protecting sexual orientation in employment circumstances; such characteristics depict an accepting environment.

Mesquida, Quirogea, and Boixados (2015) presented a summary of the needs and experiences of LGBT persons at least 50 years of age in Barcelona. Their results similarly have an increasingly familiar sound (e.g., de Vries, 2013) describing the higher rates of depression and anxiety (than those of the general population) of these older adults having survived the traumas of violence, exclusion and repression of their early life into later years of ongoing marginalization and vulnerability. There is a greater reliance on public and social services (Mesquida et al., 2015) often owing to alienation from biological kin, similar to U.S. findings (MetLife, 2010).

European data suggest, however, that differences exist between these two countries in the current environment for LGBT persons. For example, a European Commission study (2015) examined discrimination in the European Union across multiple dimensions, including sexual orientation and gender identity. Results revealed that 90% of respondents in Spain agreed with the statement, "gay, lesbian and bisexual people should have the same rights as heterosexual people"; 71% of Portuguese respondents replied affirmatively. Similarly, 87% of Spanish respondents agreed with the statement, "There is nothing wrong in a sexual relationship between two persons of the same sex"; the corresponding percentage of Portuguese respondents was 59%.

These social environments may well affect the psychosocial lives of LGBT persons living therein. Therefore, the purpose of this study was to assess levels of depressive symptoms and quality of life, comparing these two countries and exploring further associations between these two variables. This information is necessary to support the development of interventions to effectively promote health-care engagement among gay and bisexual older men, which is an important step toward developing strategies to reduce health disparities in this population.

Methods

Participants

A convenience sample of a total of 191 self-identified older gay and bisexual men participated in the study in comparable numbers: 98 participants were from

Spain and 93 were from Portugal. These men had an average age of 70.04 years ($SD = 5.60$), ranging from 65 to 82 years. No significant differences in age were found between participants from Portugal (average age = 68.94) and Spain (average age = 71.14). Nearly two thirds (60%) of participants identified as gay and 40% as bisexual, again in comparable proportions in both countries.

In Table 1, we describe in greater detail sociodemographic information of all participants in the study. It was a minority of both samples who reported being in some form of romantic relationship (33% for Portugal, about 40% for Spain). The majority of both samples lived in large urban centers; the Spanish samples were somewhat more highly educated. Surprisingly, almost 60% of both samples reported having children; the vast majority were retired; monthly income was reportedly sufficient, though almost 40% of the Portuguese men reported that it was not, compared with about 25% of the Spanish men. Similarly, more Spanish men owned their own homes/apartments than did the men from Portugal. The equality of variances for all variables was calculated for the two groups of Spanish and Portuguese participants with Levene's homogeneity test. The resulting p value ($>.05$) showed that the obtained differences in sample variances were homogeneous.

Measures

The survey included three categories of questions/measures: demographic information, depression symptoms, and quality of life.

Demographic information. Items included those summarized earlier: age, sexual orientation, marital status, place of residence, education, having children, current professional situation, sufficiency of monthly income, and the type of residence in which participants were living.

Depression. Participants' perceived levels of depression were measured using the Center for Epidemiologic Studies—Depression Scale (CES-D) (Radloff, 1977). The CES-D is a 20-item scale that has the objective of measuring depression symptoms in community populations. It is useful to screen for symptoms but not for confirming diagnosis. Participants answer questions based on the week preceding the evaluation using a 4-point scale ranging from 0 (*rarely*) to 3 (*most of the time*). The total score is calculated using a simple sum that varies from 0 to 60, with higher scores indicating more depressive symptoms. The Portuguese version (Gonçalves & Fagulha, 2014) and the Spanish version (Vaźquez, Blanco, & López, 2007) of the CES-D were used. Since factor solutions are different for each country, we chose to use only the total score to calculate levels of depression, using the cutoff point of 16. Cronbach's αs for each country revealed excellent scores ($\alpha = .90$ for Portugal; $\alpha = .89$ for Spain).

Table 1. Sociodemographic Characteristics of the Participants ($N = 191$; Mean Age = 70.04 Years).

	Portugal ($N = 93$)		Spain ($N = 98$)	
	n	%	*n*	%
Sexual orientation				
Gay	55	59.1	59	60.2
Bisexual	38	40.9	39	39.8
Marital status				
Single	37	39.8	38	38.8
Married	16	17.2	18	18.4
Divorced/separated	22	23.7	16	16.3
Widower	2	2.2	5	5.1
De facto union	5	5.3	5	5.1
Emotional commitment	11	11.8	16	16.3
Place of residence				
Big urban place	61	65.6	58	59.2
Small urban place	23	24.7	31	31.6
Big rural place	5	5.3	5	5.1
Small rural place	4	4.4	4	4.1
Education				
Up to 4 years of school	8	8.6	3	3.1
Up to 9 years of school	25	26.9	16	16.3
Secondary education completed	42	45.1	38	38.8
University degree	18	19.4	41	41.8
Children				
Yes	52	55.9	56	57.1
No	40	44.1	42	42.9
Current professional situation				
Retired	65	69.9	70	71.4
Employed	28	30.1	28	28.6
Monthly income sufficient				
Yes	54	58.1	73	74.5
No	39	41.9	25	25.5
Residence type				
Owned house/apartment	48	51.6	68	69.4
Rented house/apartment	45	48.4	30	30.6

Quality of life. We used the brief version of the World Health Organization Instrument to Assess Quality of Life (WHOQOL-BREF) (Skevington, Lotfy, & O'Connell, 2004). This is a 24-item abbreviated version of the WHOQOL-100. The brief version covers four domains as well as the overall perception of QOL. The four domains are as follows: physical health (seven items); psychological relationship (six items); social relationship (three items); and environment

(eight items). The Portuguese version (Vaz Serra et al., 2006) and the Spanish version (Lucas-Carrasco, 1998) were used. The WHOQOL-BREF is a sound and a cross-culturally valid assessment of quality of life (Lucas-Carrasco, Laidlaw, & Power, 2011). Cronbach's α's for each country revealed excellent scores ($\alpha = .92$ for Portugal; $\alpha = .90$ for Spain).

Procedures

The survey was conducted between January 2018 and March 2018. Recruitment targeted specifically older gay and bisexual men and involved Internet notifications (emails and electronic messages) and advertisements sent to LGB organizations (such as FELGTB—National Federation of Lesbians, Gays, Transsexuals and Bisexuals of Spain, ILGA—Portugal and Opus Gay—Portugal), social networks such as Facebook, and mailing lists. Participants responded to this outreach online by way of two websites created for this purpose, one in Portuguese and another one in Spanish. All advertisements referred participants directly to the online survey according to the respective nationality, where they were informed that their responses would be anonymous and confidential, according to the Helsinki Declaration of Ethical Principles for research with human subjects. Also, this study was approved by the Ethical Committee of the University of Beira Interior (Portugal). The first page of the questionnaire explained the objectives of the study and informed participants about how to complete the survey, their freedom to withdraw from the study, and how to contact the authors for further information, if needed. Confidentiality was assured by using codes on data documents, by encrypting identifiable data, by assigning security codes to computerized records, and by limiting access to identifiable information (IP address).

Results

Depression

Overall results for depressive symptoms indicate moderate levels of depression (mean score = 18, $SD = 6.70$, median = 16, mode =14, ranging from 5 to 39), which is higher than the cutoff point of a mean score of 16. When comparing levels of depressive symptoms between sexual orientations (gay vs. bisexual men) and Spanish and Portuguese participants, significant differences were found: Self-identified gay older men and Spanish older men present higher levels of depressive symptoms than bisexual older men and Portuguese older men (see Table 2 for these results).

Table 2. Results for Depressive Symptoms by Sexual Orientation and Nationality.

	n	*M* (*SD*)	*T* (*df*)	*p*
Depressive symptoms				
Gay men	114	18.17 (7.05)	2.445 (160)	.016*
Bisexual men	77	15.90 (5.31)		
Portuguese	93	16.97 (6.49)	−2.049 (160)	.042*
Spanish	98	19.13 (6.89)		

*$p < .05$.

Quality of Life

To assess levels of QOL for all dimensions, cutoff points were determined for each dimension and the observed mean was then compared with the respective cutoff, adhering to the criteria established for the critical value of 60% as the optimal cutoff point for assessing perceived quality of life in older people (Silva, Soares, Santos, & Silva, 2014). For the overall perception of QOL, a mean of 7.19 ($SD = 1.45$) was obtained, ranging from 3 to 10, indicating that participants perceived moderate levels of QOL since the cutoff point would be 7. No significant differences were found between gay and bisexual, and Spanish and Portuguese participants. Regarding the domain of physical health, a mean of 28.15 ($SD = 4.59$) was obtained, ranging from 12 to 35, indicating that perception of physical health was moderately positive, since the cutoff point for this dimension was 24. Self-identified gay men scored higher than bisexual men for this dimension ($p = .049$). No differences were found between Spanish and Portuguese participants for this dimension. For the psychological dimension, a mean of 23.15 ($SD = 4.08$), ranging from 10 to 30, was obtained, indicating moderate levels of QOL for this dimension, since the cutoff point was 20.5. No significant differences were found when comparing our participants by sexual orientation and nationality. Regarding the social relationships dimension, a mean of 10.59 ($SD = 2.54$) was found, ranging from 3 to 15, indicating moderate levels of QOL for this dimension, since the cutoff point was 10. Statistically significant differences were found indicating that bisexual men display higher levels of social functioning than gay men ($p = .023$). No differences were found for nationality. Finally, for the environmental dimension, a mean of 30.68 ($SD = 4.59$) was found which indicates moderately high levels of QOL of this dimension, since the cutoff point was 28.5 (with a range of 18 to 40). No significant differences were found when comparing sexual orientation and nationality for this dimension. All the results for QOL by sexual orientation and nationality are presented in Table 3.

As shown in Table 4, a correlation analysis was conducted to determine levels of association between depressive symptoms and QOL. Correlation coefficients

Table 3. Results for Quality of Life by Sexual Orientation and Nationality.

	n	*M* (*SD*)	*t* (*df*)	*p*
Overall quality of life				
Gay men	114	7.26 (1.52)	−.306 (159)	.760
Bisexual men	77	7.34 (1.25)		
Portuguese	93	7.25 (1.47)	−.392 (159)	.696
Spanish	98	7.34 (1.43)		
Physical health				
Gay men	114	74.23 (16.87)	−1.825 (153)	.049*
Bisexual men	77	79.28 (13.70)		
Portuguese	93	77.21 (17.06)	−1.305 (153)	.229
Spanish	98	73.60 (14.71)		
Psychological				
Gay men	114	70.00 (17.94)	−.898 (156)	.194
Bisexual men	77	73.87 (14.40)		
Portuguese	93	72.23 (17.31)	.567 (156)	.371
Spanish	98	69.59 (16.64)		
Social relationships				
Gay men	114	60.67 (21.67)	−2.302 (158)	.023*
Bisexual men	77	68.85 (19.18)		
Portuguese	93	65.33 (20.69)	1.581 (158)	.116
Spanish	98	59.89 (21.74)		
Environment				
Gay men	114	72.57 (14.83)	−.009 (156)	.993
Bisexual men	77	72.37 (12.77)		
Portuguese	93	72.40 (14.97)	−.241 (156)	.810
Spanish	98	72.68 (13.24)		

*$p < .05$.

Table 4. Results for the Correlation Matrix Between Depressive Symptoms and Quality of Life.

	1	2	3	4	5	6
1—Depressive symptoms	–					
2—Overall quality of life	−.325**	–				
3—Physical health	−.557**	.449**	–			
4—Psychological	−.610**	.510**	.488**	–		
5—Social relationships	−.527**	.446**	.430**	.661**	–	
6—Environment	−.399**	.636**	.503**	.600**	.536**	–

**$p < .001$.

Table 5. Hierarchical Multiple Regression Analysis Predicting Depressive Symptoms.

	Model 1			Model 2		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Age	.024	.082	.029	.039	.066	.048
Country of origin	1.907	1.395	.139	.515	1.125	.038
Sexual orientation	−2.792	1.577	.182	−1.493	1.264	−.097
Overall QOL				.691	.573	.141
Physical health				−.107	.050	−.254*
Psychological				−.141	.053	−.344*
Social relationships				−.073	.034	−.237*
Environment				.018	.178	.012
R^2	.065			.451		
F for change in R^2	2.287			9.652**		

Note. QOL = quality of life.
*$p < .05$. **$p < .001$.

were all strong or very strong and statistically significant ($p < .001$), indicating that depressive symptoms are negatively associated with all dimensions of QOL.

Finally, a hierarchical multiple regression analysis was performed to assess the effects of overall perception of QOL on depressive symptoms. The possible confounding variables "age," "sexual orientation," and "country of origin" were added in the first block. All dimensions of QOL were added in the second block. The first block of the analysis explained 6.5% of the overall variance, while the second block—QOL—explained 45%. Therefore, as shown in Table 5, lower levels of physical health, psychological symptoms, and social relationships were significant predictors of depressive symptoms in the second step.

Discussion

The results of this research showed overall moderate levels of both depression and of perceived quality of life. Older gay men and older Spanish men reported higher levels of depressive symptoms than older bisexual and older Portuguese men. Gay men scored higher on physical health dimensions, but bisexual older men scored higher on the social relationships dimension. Lower levels of physical health, psychological symptoms, and social relationships were significant predictors of depressive symptoms not influenced by country or sexual orientation. All differences were statistically significant ($p < .05$). Thus, this study offers an exploratory, preliminary, and unique cross-national contribution to the literature on aging and psychological well-being among older gay and bisexual men. Findings reveal many similarities both between the two samples from

Spain and Portugal and with existing (primarily North American) research, some nuances, and offer evocative questions for subsequent research.

Demographics Circumstances

Demographically, these men share many similarities. The majority of the gay and bisexual men in these two samples (almost two-thirds across samples) are currently single (including those who are divorced, separated, and widowed). Such rates are dissimilar to those of comparably aged heterosexual men, yet consistent with U.S. research on the relational status of older gay and bisexual men (de Vries, 2013; Fredriksen-Goldsen, Kim, Bryan, Shiu, & Emlet, 2017). Singlehood introduces potential vulnerabilities in later life in many domains, not the least of which includes the reduced potential for the provision of care.

Unlike much research in the United States, over half of these gay and bisexual men in this study report having children; in the United States, up to 75% of LGBT samples report not having children (e.g., Fredriksen-Goldsen, Kim, Barkan, Balsam, & Mincer, 2010). The extent to which these children are either physically or emotionally available is not known; in U.S. research in San Francisco, it was found that 60% of older LGBT persons with children felt that their children were not available to time (Fredriksen-Goldsen et al., 2013). Still, relative to U.S. research, there exists greater potential support from children among these gay and bisexual Spanish and Portuguese men—an area that offers interesting prospects for subsequent research.

One demographic difference between the two samples lies in the perceived sufficiency of income; here, a greater proportion of Portuguese sample felt that their income was not sufficient as compared with the men in the Spanish sample. Such financial stressors, added to the stressors of aging in general, may well have an effect on quality of life and potentially increase vulnerabilities. Lee, Oliffe, Kelly, and Ferllatte (2017) have found, for example, that lower socioeconomic status is a predictor of depression and lower quality of life.

Affective Experiences

In the context of quality of life dimensions, gay men scored significantly higher than bisexual men on physical health (e.g., mobility, activities, pain, energy) and lower on social functioning (i.e., personal relationships, social support, sex). These differences offer a portrait of gay men as perhaps more physically active, though less socially engaged than bisexual men. Much North American research notes the relative isolation of older gay men in particular—perhaps at least superficially comparable to the reduced social engagement reported herein as observed by the lower levels of QOL obtained in the "social relationships" dimensions; such findings are typically associated with *poorer* physical health (Fredriksen-Goldsen et al., 2013). The extent to which this

alternative finding is based in/on culture, sample (e.g., internet based), or some interaction of these with sexual orientation remains to be seen and merits further research.

Concomitantly, the gay men of this sample exhibited higher symptoms of depression than bisexual men, consistent with previous research (Cochran et al., 2003; Warner et al., 2004). The higher rate of depressive symptoms may well derive, at least in part, from its association with lower social functioning (the two of which were significantly, negatively associated in overall correlations). Similar research has found that reduced support (Mustanski & Lui, 2012) and membership in a minority or socially disadvantaged groups (Lee et al., 2017) were related to depression and lower quality of life.

Interestingly, the Spanish sample of gay and bisexual men also presented higher levels of depressive symptoms than did the Portuguese sample. There is some previous supporting this finding and implicating health. Marti-Pastor et al. (2018), for example, examined health-related quality of life among a random sample of Barcelona residents finding that gay and bisexual men (as well as lesbians and bisexual women) reported significantly worse health-related quality of life; these authors propose that chronic conditions and health-related behaviors may account for a wide swath of differences by sexual orientation due to internalized stigma and anticipation of discrimination. Similar data on the poor health of older gay and bisexual men in Barcelona have been reported as well (Perez, Marti-Pastor et al., 2015).

Neither nationality nor sexual orientation contributed significantly to the regression analysis predicting depression; lower levels of physical health, psychological symptoms, and social engagement were significant predictors. These are the general predictors of some of the more specific associations cited earlier drawing from a building body of research on the sequel of poorer physical and mental health (Fredriksen-Goldsen et al., 2017) and fewer social and financial resources (Lee et al., 2017). These data offer international support for such associations.

Limitations and Future Directions

Several limitations ultimately restrict the generalizability of the findings of this exploratory research. The samples were disproportionately urban, well-educated men with Internet and technology access, recruited through social organizational and social network settings; the extent to which these gay and bisexual men are similar to men from other regions of the countries remains to be studied. However, the intention of this study was not to generalize the findings to all older gay and bisexual men but to provide a contribution from Spanish and Portuguese realities to better understand the obstacles that older gay and bisexual men experience. Finally, some of the measures included were more

presumptive than derivative (e.g., physical health); additional measures would have assisted in filling out the details and associations (e.g., social support).

Further comparative research would enhance this field—across European countries and beyond. For example, it would be of interest to explore the diurnal lives of older Spanish and Portuguese gay and bisexual men (and lesbian and bisexual women), both cisgender and transgender, given the varying social conditions of the countries of residence. In particular, the family ties and social connections are of interest. Much is studied, recently, in these domains in the United States and such comparisons would be intriguing. A better understanding of the experiences of sexual and gender minorities in such international contexts would contribute to the field of gerontology in general and to the better appreciation of, and service provision to, all older adults in particular—with a renewed awareness of myriad contexts within which individuals age.

National/International Relevance and Implications

Both Spain and Portugal, in a little over one generation, have gone from being among the most repressive to the most egalitarian societies for LGB people in the world. Under the fascist dictatorships of Franco in Spain and Salazar in Portugal, homosexuality was forbidden and LGB people were reportedly imprisoned in large numbers. But soon after both regimes collapsed in the mid-1970s, the new democracies embarked on a legal overhaul. Today, Spain and Portugal are among a handful of countries in the world that have enshrined in their constitutions the prohibition of discrimination on the grounds of sexual orientation. The two countries have presented legislation that is inclusive and protective of LGB people, such as the 2005 (Spain) and the 2010 (Portugal) laws allowing same-sex couples to marry, or the 2005 (Spain) and the 2016 (Portugal) laws allowing same-sex couples to adopt and joint-adopt children. Today, LGB identities share a great deal of visibility, especially in big cities across the Iberian Peninsula.

Nonetheless, discrimination can still be encountered in small villages and among some parts of society, and differences can be observed when comparing the two countries as well. For example, according to the European Union LGBT Survey (European Union Agency for Fundamental Rights, 2014), 38% of Spanish respondents felt discriminated against or harassed on the grounds of sexual orientation in the last 12 months, whereas for Portuguese respondents, the figure was 51%. Thus, it seems that Portuguese society is more restricted by negative societal attitudes toward LGB people that the Spanish one. Unfortunately, the European Survey is completely omissive of any reference to LGB *older* people.

Our results are consistent with accumulating data indicating that depression and quality of live can be diminished due to exposure to social discrimination, and policy makers need to be particularly aware of older gay and bisexual

people's needs in their social inclusion decisions—currently scarce in both countries. To begin addressing this omission, this study documented the depressive symptoms and quality of life among Gay and Bisexual older men, but more research is needed, namely, the inclusion of heterosexual older persons to address health disparities among these groups. In addition, qualitative research is needed to address the needs of LGB older persons that could translate into more inclusive policy measures, namely, innovation when implementing local and global actions to protect LGB older adults from the risk of depression and facilitating the improvement of their overall levels of quality of life.

Still, these data add to the international discourse on aging among sexual minority persons and contribute further to the evidence of depression experienced by gay and bisexual men. Furthermore, our results allowed the identification of several predictors of depression that may be influenced by cultural meanings of what it is like to be vulnerable to depression as an older gay or bisexual male in Spanish and Portuguese cultures, facilitating dialogue, questioning sources of oppression, and promoting of values which are committed to social change for this group of people, ensuring the implementation of prejudiced-free practice guidelines in these two countries and others.

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