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Links between Savoring, Rumination, and Sleep-Related Experiences Across Adulthood: Implications for Older Adults

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Abstract

Objectives: Sleep problems are pervasive, particularly in older adults. Much work examines psychological factors that adversely affect sleep; fewer studies examine those with a positive effect. Savoring is a form of positive repetitive thought that is linked to several aspects of health but has been understudied in relation to sleep. We examined cross-sectional associations of both savoring and rumination with subjective sleep experiences, and assessed if these associations vary by age.

Methods: Adults and older adults (N=216) ranging from 20-80 years in age ($M=44.9\pm 15.6$ years) completed an online survey of validated measures of savoring, rumination, sleep disturbance, and sleep-related impairment.

Results: Higher levels of savoring were significantly associated with lower levels of sleep-related impairment but not sleep disturbance in regression analyses. Higher levels of rumination were significantly associated with higher levels of sleep disturbance and sleep-related impairment. Associations of savoring and rumination with sleep-related experiences did not vary by age.

Conclusions: Savoring and rumination are relevant to sleep-related experiences in adults ranging from younger to older. Further investigation of the potential positive impact of savoring on sleep-related experiences is needed.

Clinical Implications: Engagement in savoring and rumination should be considered when assessing sleep and sleep-related impairment in adults.

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Keywords

sleep; sleep disturbance; sleep-related impairment; savoring; rumination; adults; older adults; aging

Background

Older adults commonly experience disturbances in aspects of sleep such as sleep continuity, quality, and satisfaction (i.e., sleep disturbance) and daytime impairments related to sleep disturbance, such as feeling tired or having difficulty concentrating (i.e., sleep-related impairment; Ancoli-Israel, 2009; Li et al., 2018; Miner & Kryger, 2017). For instance, in a national survey of adults aged 55-84 years old, more than two thirds endorsed symptoms such as difficulty falling asleep, frequent nighttime awakenings, early morning awakenings, feeling unrefreshed upon awakening, pauses in breathing, snoring, or unpleasant sensations in the legs (National Sleep Foundation, 2003). Accordingly, much work has focused on identifying factors that precipitate or exacerbate sleep problems in later life. Importantly, however, not all older adults report sleep disturbance and chronological age is not a consistent predictor of sleep disturbance (Miner & Kryger, 2017; Smagula et al., 2016). Thus, it is important to not only identify factors that adversely affect sleep experiences but also to examine factors that may positively affect sleep experiences. Work of this nature—examining factors positively associated with sleep health—is relatively sparse but is needed considering the potential salubrious effects of having good sleep health across the lifespan. Addressing this important gap in the literature, we sought to examine the association of savoring, a form of positive repetitive thought, with sleep disturbance and sleep-related impairment in a sample ranging from early adults to older adults.

Repetitive thought is conceptualized as thinking “attentively, repetitively, or frequently about oneself or one’s world” (Segerstrom et al., 2003). Repetitive thought can vary in valence (e.g., predominantly positive or predominantly negative content) and purpose (e.g., searching, seeking certainty, problem-solving) and is relevant to a range of psychological and physical experiences, including sleep (Segerstrom et al., 2010; Watkins, 2008). To date, research has focused predominately on negatively-valenced forms of repetitive thought (e.g., rumination, worry) and how they exacerbate or perpetuate sleep problems, such as insomnia (Pillai & Drake, 2015). For instance, rumination, defined as thinking characterized by repeated, intrusive, and uncontrollable thoughts, has been cross-sectionally and prospectively associated with greater sleep disturbance (Clancy et al., 2020; Pillai & Drake, 2015). Negatively-valenced forms of thought, however, only represent part of the spectrum of processes that could affect sleep and sleep-related impairment. Positive cognitive processes may also be associated with enhanced sleep experiences, yet are under-investigated.

Savoring is a form of positive repetitive thought and emotion regulation in which attending to positive experiences results in the generation or maintenance of positive affect (Bryant & Veroff, 2007; Bryant et al., 2011). The focus of savoring may be internal (e.g., a feeling of pride) or external (e.g., a beautiful landscape) and may involve paying attention to the

experience of past, present, or future positive experiences (Bryant & Veroff, 2007). Savoring is positively associated with several aspects of mental and physical health including positive emotions, psychological well-being, and perceived physical health (Geiger et al., 2017; Jose et al., 2012; Ramsey & Gentzler, 2014; Smith & Hollinger-Smith, 2015; Smith et al., 2020). It is a fairly naturally occurring behavior (Heiy & Cheavens, 2014) and is amenable to change through behavioral intervention (Hurley & Kwon, 2013; Smith et al., 2014), providing rationale for examining its potential as an adjunct to existing psychological and behavioral treatments. Indeed, savoring has been proposed as a potential sleep-promoting behavior (Kaplan et al., 2009) and included in select studies of behavioral sleep interventions in adolescents (Blake et al., 2016; Clarke et al., 2015; McMakin et al., 2019; Waloszek et al., 2015), but has not been examined specifically as a correlate of sleep or sleep-related experiences in adolescents or adults.

Psychobiological and cognitive models of good sleep and insomnia provide useful frameworks and rationale for investigating the relevance of savoring in the context of sleep disturbance and sleep-related impairment. Espie's (2002) psychobiological model conceptualizes good sleep as being maintained by cognitive de-arousal (e.g., minimizing cognitively arousing activity, unhelpful sleep-related thoughts/attributions), physiological de-arousal (e.g., engaging the sleep system and disengaging the wake system), daytime facilitation of nighttime sleep (e.g., effective coping techniques, affect regulation), and sleep stimulus control (e.g., regular sleep habits, conditioned sleep-compatible behaviors). According to this model, insomnia results from chronic inhibition of the above-listed processes (Espie, 2002). Cognitive and cognitive-behavioral models of insomnia similarly conceptualize negative or unhelpful cognitive processes, occurring both during the day and at night, as contributing to sleep disturbance and sleep-related impairments in performance/functioning through, for example, arousal and behavioral pathways (Harvey, 2002; Morin, 1993). As a positive form of repetitive thought and emotion regulation strategy, savoring may facilitate good sleep through cognitive and physiological de-arousal pathways, as well as through the pathway of daytime facilitation of sleep.

The Present Study

In the present study, we examined cross-sectional associations of savoring and rumination with self-reported sleep experiences in a sample of community-dwelling adults ranging in age from 20 to 80 years old. We specifically sought to determine if savoring and rumination relate to sleep disturbance and sleep-related impairment. We hypothesized that: 1) savoring would be negatively associated with sleep disturbance and sleep-related impairment and 2) rumination would be positively associated with self-rated sleep disturbance and sleep-related impairment. Considering the wide age-range of the sample, emerging evidence demonstrating age differences in the effects of savoring on the upregulation of positive emotions (Palmer & Gentzler, 2019) and, potential age-related differences in socioemotional processes (e.g., Carstensen et al., 1999; Charles, 2010), we also conducted exploratory analyses to determine if age moderated the associations of savoring and rumination with sleep disturbance and sleep-related impairment.

Methods

Participants

To be included in the current study, individuals had to: be at least 18 years of age, reside in the United States, and have internet access. Participants also had to respond correctly to two instructional manipulation checks assessing attention to study materials. Data from participants who responded incorrectly to either item were excluded from study analyses. The final sample consisted of 216 adults ranging from younger to older adults.

Measures

Covariates—Age, sex, income adequacy (an indicator of socioeconomic status), self-rated mental health, and number of self-reported physical health conditions were included as covariates in primary analyses based on prior work linking these constructs to sleep and sleep-related experiences (Grandner, 2017; Lichstein et al., 2013; Troxel et al., 2020). Participants self-reported sociodemographic characteristics, including age and sex, on a questionnaire developed for the study. Participants indicated the extent to which they have difficulty paying for basic living expenses (e.g., food, housing, medical care) on a 4-point Likert-type scale (1 = *not at all*, 4 = *very difficult*). Scores were dichotomized such that a score of 0 represents no difficulty paying for basic living expenses and a score of 1 represents a neutral extent of difficulty or greater. A modified version of a self-reported physical health measure developed by Lichstein and colleagues (2013) was used to derive a count of physical health conditions. Participants indicated whether they had been diagnosed with ten physical health conditions such as heart disease, cancer, and diabetes. Mental health was assessed using the Patient-Reported Outcomes Measurement Information System (PROMIS®) Global Health Short Form v. 1.1, Adult, English version (Cella et al., 2007; Hays et al., 2009). Items on this measure assess general mental health and emotional problems over the past 7 days. T-score values were calculated for each participant using the HealthMeasures scoring service. Higher scores are indicative of better mental health.

Savoring—The Savoring Beliefs Inventory (SBI; Bryant, 2003) was used to measure participants' beliefs about their ability to savor positive experiences. Participants indicated on a 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*) the extent to which they agreed with 24 statements such as, "I enjoy looking back on happy times from my past," and "I feel a joy of anticipation when I think about upcoming good things." Participants' responses on the SBI were used to derive a total SBI score. The summed scoring method was used (Bryant & Veroff, 2007), with possible total scores ranging from -72 to +72. Higher scores indicate stronger beliefs about one's own ability to savor, which are posited to be consistent with levels of engagement in savoring. The SBI evidenced good internal reliability in validation studies of college students and older adult samples (Cronbach's α ranging from .88 to .94; Bryant, 2003), as well as in the current sample (Cronbach's α = .95).

Rumination—The Ruminative Thought Style questionnaire (RTS; Brinker & Dozois, 2009) was used to assess rumination. Respondents indicated on a 7-point Likert-type scale (1 = *not at all*, 7 = *very well*) the extent to which 20 items (e.g., "I find that my mind

goes over things again and again” and “When I have a problem, it will gnaw on my mind for a long time”) described them. Item responses were summed for a total score, with higher scores indicating greater ruminative thought style. The RTS exhibits strong internal reliability (Cronbach’s $\alpha = .92$), as well as convergent and divergent validity (Brinker & Dozois, 2009). In the present study, the internal reliability of the RTS was also strong (Cronbach’s $\alpha = .97$).

Sleep disturbance and sleep-related impairment—Sleep disturbance and sleep-related impairment were measured using the PROMIS Short Form v 1.0–Sleep Disturbance 8b and the PROMIS Short Form v 1.0–Sleep-Related Impairment 8a, respectively (Adult forms, English language; Buysse et al., 2010). The PROMIS Short Form v 1.0–Sleep Disturbance 8b is an eight-item, global measure of sleep disturbance during the past 7 days; it assesses aspects of sleep disturbance related to sleep quality, difficulties, and continuity. The PROMIS Short Form v 1.0–Sleep-Related Impairment 8a is an eight-item, global measure of daytime alertness, sleepiness, and functioning during the past 7 days.

For each measure, participants indicated responses on a 5-point Likert-type scale. Raw item responses were then used to calculate T-score values. T-score values were calculated for each measure using the HealthMeasures scoring service. Higher scores are indicative of greater sleep disturbance and sleep-related impairment. The PROMIS Sleep-Disturbance and Sleep-Related Impairment Short Forms are considered valid and reliable in individuals with and without sleep disorders (Yu et al., 2012). In the current sample, internal reliability was high (Cronbach’s $\alpha = .95$ for both measures).

Procedure

Study procedures were approved by the The University of Alabama Institutional Review Board (IRB). Participants were recruited online via Amazon Mechanical Turk (MTurk), a crowdsourcing site where individuals can complete tasks and be reimbursed for task completion virtually; they then completed a cross-sectional online survey via Qualtrics, a software tool used for survey administration. Both MTurk and Qualtrics are commonly used in social sciences research. There is evidence for the reliability of data collected via MTurk (Goodman et al., 2013; Ramsey & Gentzler, 2014). Nevertheless, several methods were applied to further enhance data quality. Based in part on a prior MTurk study that excluded a small number of participants for reporting inconsistent ages (Ramsey & Gentzler, 2014), participants input their age and birth month and year at two different points during the survey. Further, per recommendations by Goodman et al. (2013), the survey contained two previously mentioned items to assess attention to study materials; one item was consistently presented at the beginning of the survey materials and the other was embedded within the savoring measure.

Respondents were presented with a study information sheet; those who were interested in participating in the study behaviorally indicated informed consent by selecting an “I agree” response. Participants were then prompted to complete the study materials via the Qualtrics survey. The ordering of measures was randomized, except for the demographics questionnaire which was consistently presented last. Participants were provided with modest

compensation (75 cents) for study participation. Data collection occurred in batches over the course of approximately 4 months. Study materials were released for completion in batches and several steps were taken in an effort to recruit an age-diverse sample. To facilitate adequate representation of older adults within the sample, data accumulated during initial batch releases were examined and subsequent batches were limited in recruitment of specific age ranges that were underrepresented. Sample batches were released across all seven days of the week and across different times of day to promote a recruitment of a heterogeneous sample. Indeed, more recent studies suggest small differences in the demographic composition of samples recruited from MTurk across different times of day (e.g., Casey et al., 2017).

Summary of Statistical Analyses

Statistical analyses were conducted with SPSS Version 25. Statistical significance was set at the .05 probability level. The listwise deletion function was used for all analyses. The primary study aims were tested using two multiple hierarchical regression models. In each model, covariates (age, sex, income adequacy, self-rated mental health, and number of physical health conditions) were entered in the first step and predictors of interest (savoring and rumination) were entered in the second step. Hierarchical regression is useful when new constructs are being offered to explain additional variance beyond well-established factors. Thus, the hierarchical entry approach enabled determination of the extent to which savoring and rumination explained variance in sleep disturbance and sleep-related impairment above and beyond variables previously linked to sleep-related experiences. Assumptions of multiple regression were assessed and were not indicative of significant violations. Missing data was minimal and therefore treated as missing. Power analysis was conducted using G*Power (Faul et al., 2007). With a sample of 216, our post hoc power for models with a maximum of seven predictors was greater than .96, and thus sufficient to detect small to medium main effects of savoring and rumination, $f^2 = .08$.

For follow-up exploratory analyses examining the potential moderating role of age, we conducted two multiple regression models, with sleep disturbance and sleep-related impairment, respectively, designated as the dependent variable. Covariates (sex, income adequacy, self-rated mental health, and number of physical health conditions) and predictors of interest (age, savoring, and rumination) were entered in the first step; interaction terms (savoring*age and rumination*age) were entered in the second step.

Results

Sample characteristics

Participant characteristics are reported in Table 1. Participants ranged in age from 20 to 80 years ($M = 44.9$ years, $SD = 15.6$ years). Targeted recruitment efforts resulted in adults age 50 years or older comprising approximately 39% of the sample. Most of the sample identified as female and White or Non-Hispanic. On a measure of income adequacy, 42.1% of the sample indicated no difficulty paying for basic living costs; 53.7% indicated neutral responses or responses suggestive of difficulty paying for basic living costs. Descriptive statistics for the primary variables of interest are reported in Table 2. Average levels of sleep

disturbance and sleep-related impairment were within normal limits (Buysse et al., 2010; Yu et al., 2012).

Intercorrelations among savoring, rumination, and self-reported sleep variables are reported in Table 2. Consistent with the notion that savoring and rumination each represent forms of repetitive thought, savoring and rumination scores were moderately, negatively correlated in bivariate analyses. Savoring was also moderately, negatively correlated with sleep disturbance and sleep-related impairment. There were moderate to large, positive correlations evidenced between rumination, sleep disturbance, and sleep-related impairment, respectively.

Associations of savoring, rumination, and sleep disturbance

The first multiple regression model assessed the associations of savoring and rumination with self-rated sleep disturbance (Table 3). Covariates were entered in step one and accounted for 32.2% of variance in sleep disturbance, $R^2 = .32$, $F(5, 194) = 18.4$, $p < .001$. Savoring and rumination variables were entered in step 2 and significantly accounted for an additional 5.6% of variance in sleep disturbance, $R^2 = .38$, $F(7, 192) = 16.6$, $p < .001$. In the final model, fewer physical health conditions, higher self-rated mental health, and lower levels of rumination were significantly associated with lower levels of sleep disturbance. Savoring was not significantly associated with sleep disturbance.

Associations of savoring, rumination, and sleep-related impairment

The second multiple regression model assessed the associations of savoring and rumination with sleep-related impairment (Table 4). Entered in step one, covariates accounted for 34.1% of variance in sleep-related impairment, $R^2 = .34$, $F(5, 194) = 20.1$, $p < .001$. Savoring and rumination variables were entered in step 2 and significantly accounted for an additional 11.2% of variance in sleep-related impairment, $R^2 = .45$, $F(7, 192) = 22.7$, $p < .001$. In the final model, male sex, fewer physical health conditions, and higher self-rated mental health were significantly associated with lower levels of sleep-related impairment. Higher levels of savoring and lower levels of rumination were significantly associated with lower levels of sleep-related impairment.

Follow-up analyses

In regression models assessing age as a moderator of the associations of savoring and rumination with sleep-related experiences, the savoring by age and rumination by age interaction terms were nonsignificant in the models predicting sleep disturbance (savoring*age $\beta = .04$, $p = .83$; rumination*age $\beta = .20$, $p = .36$) and sleep-related impairment (savoring*age $\beta = .02$, $p = .90$; rumination*age $\beta = .28$, $p = .16$). Age was not a significant moderator of the associations of savoring and rumination with sleep disturbance or sleep-related impairment.

Discussion

This study uniquely contributes to the literature by investigating cross-sectional associations of savoring and rumination with sleep disturbance and sleep-related impairment in

community-dwelling adults ranging in age from 20 to 80 years old. Consistent with our hypotheses, higher levels of savoring were significantly associated with lower levels of sleep-related impairment and higher levels of rumination were associated with higher levels of sleep disturbance and sleep-related impairment. Contrary to our hypotheses, savoring was not significantly associated with sleep disturbance. The associations of savoring and rumination with sleep disturbance and sleep-related impairment did not vary by age. This study is among the first to examine savoring in relation to sleep-related experiences and represents one of the few to include adequate numbers of older adults in the examination of repetitive thought, sleep disturbance, and sleep-related impairment among community-dwelling adults.

Our findings suggest that savoring is uniquely associated with sleep-related impairment. Based on the broad age-range of the sample, lifespan theories of socioemotional processes (Carstensen et al., 1999; Charles, 2010), and recent empirical findings regarding age-related differences in the emotional effects of savoring (Palmer & Gentzler, 2019) we also evaluated if age moderated the associations of savoring with sleep disturbance and sleep-related impairment. Age-moderation effects were not observed. Interpreted with the findings from the primary main effects analyses, it appears that savoring is relevant to sleep-related impairment in younger, middle, and older adults.

The measure of sleep-related impairment in this study assessed aspects of impairment such as alertness upon awakening, feeling tired or sleepy during the day, having trouble staying awake during the day, and sleep-related impact on concentration and irritability. The finding that savoring was uniquely associated with sleep-related impairment is interesting in suggesting that savoring may be relevant to sleep-related functioning. It is possible that individuals inclined to focusing on positive experiences are better able to prevent sleep difficulties from interfering with their daily lives. This functional adaptivity could be particularly beneficial later in life as older adults tend to nap more often than younger adults and middle-aged adults and also commonly report excessive daytime sleepiness (Li et al., 2018). Further, certain age-associated changes in sleep architecture (e.g., reduction in slow-wave sleep) may be less responsive to or directly remediable via intervention; thus, strategies that positively impacting daytime functioning may be especially useful for older adults. Across adult ages, savoring could be a useful coping strategy for individuals who are experiencing sleep disturbance due to other reasons outside of their control (e.g., caregiving, bereavement, work schedules).

Although we anticipated that savoring would be associated with both measures of sleep-related experiences, our findings did not reveal a significant association of savoring with sleep disturbance. There may be several explanations for why savoring was not significantly associated with sleep disturbance in this study. Foremost, the employed savoring measure assesses savoring processes generally rather than specifically in the context of sleep. Individuals who endorse high levels of savoring may not necessarily engage in savoring as a sleep promoting strategy (e.g., prior to initiating sleep, during nighttime awakenings). If savoring is related to sleep disturbance via cognitive and physiological de-arousal pathways (Espie, 2003; Harvey, 2002) individual differences in the effects of savoring on these pathways may also help to explain the nonsignificant association with sleep disturbance.

Future studies that assess when savoring occurs (i.e., timing in relation to sleep), under what circumstances savoring occurs, and what de-arousing effects savoring has will be useful for better understanding the association of savoring and both sleep disturbance and sleep-related impairment. Furthermore, studies examining the temporal distribution of repetitive thought patterns across the day may help to explain the different findings for savoring versus rumination as a predictor of sleep disturbance. For example, perhaps savoring is more likely to occur throughout the day while rumination has a greater likelihood of occurring before bed, particularly in those with sleep disturbances.

Prior work has associated ruminative thinking and sleep difficulties in non-clinical (e.g., Takano et al., 2012; Thomsen et al., 2003) and clinical samples (e.g., Carney et al., 2010). Our finding that higher levels of rumination were associated with more perceived sleep disturbance and sleep-related impairment provides additional support for the association of ruminative thought style and sleep difficulties in a non-clinical sample. Although much prior work has been conducted in younger and middle-aged adults, the current sample was purposefully age-diverse, ranging from younger to older adults. In this age-diverse sample the associations of rumination with sleep disturbance and sleep-related impairment did not vary by age. These findings therefore provide support for the relevance of rumination to sleep experiences across adult ages. As alluded to above, these findings highlight the potential value of examining savoring as an adaptive thinking pattern and emotion regulation strategy to mitigate sleep-related impairment. In a sample of university students, savoring was identified as the most frequently used positive emotion regulation strategy among 20 strategies assessed (Heij & Cheavens, 2014). From a treatment perspective, if individuals are already engaging in savoring, it may be sufficient to highlight the importance of doing so more often or intentionally.

Theoretically it has been hypothesized that older adults may savor more frequently and skillfully as a result of socioemotional processes and future time perspective (Bryant & Veroff, 2007). However, more recent empirical investigations have demonstrated no significant association of savoring with age or even a tendency for older adults to savor less than younger and middle-aged adults (Palmer & Gentzler, 2019; Ramsey & Gentzler, 2014). Thus, formalized and tailored instruction on savoring may be needed for older adults. Notably, though a limited number of studies have incorporated the practice of savoring into cognitive-behavioral and mindfulness interventions for sleep in adolescence (e.g., Blake et al., 2016; Clarke et al., 2015; Dahl et al., 2009; Waloszek et al., 2015), the unique impact of savoring in behavioral sleep interventions has not been described or applied in older samples.

Several limitations of the current study should be noted. Methodologically, the cross-sectional design prevents causal inferences from being drawn. The detection of cross-sectional associations, however, supports the need for future work discerning temporal and causal associations among these phenomena. A second limitation relates to our use of retrospective, self-report measures of sleep and a generalized self-report measure of savoring. Subjective measures of sleep have been linked to clinical outcomes (e.g., frailty, mortality; Cappuccio et al., 2010; Ensrud et al., 2009) and have important applied implications given their common use in clinical practice. However, longitudinal

studies employing objective measures of sleep would be useful for addressing potential reporting and common methods biases. A final limitation relates to the study sample and generalizability. Aligned with reports on the composition of MTurk samples (e.g., Hitlin, 2016), the sample in the present study was relatively well-educated and healthy, and was less racially diverse than would be expected based on national Census data (Vespa et al., 2018). Future studies in this area with samples that are diverse with regards to race, educational background, and health status are needed.

Sleep is linked to a range of physical and psychological outcomes (e.g., Hertenstein et al., 2018; Irwin, 2015; Wallace et al., 2019) and whereas sleep disturbances can confer risk for adverse health outcomes, sleep health can promote optimal health and functioning. An improved understanding of positive factors that could promote sleep health is critical for improving health and well-being. Our findings provide new support for the unique association of savoring with sleep-related impairment and corroborate existing literature associating rumination with subjective sleep disturbance and sleep-related impairment across the adult age range. They also add to accumulating work supporting the relevance of savoring to health and well-being (Geiger et al., 2017; Jose, Lim, & Bryant, 2012; Ramsey & Gentzler, 2014; Smith & Hollinger-Smith, 2015; Smith et al., 2020). Experimental and longitudinal research is needed to discern the causal and temporal associations of positive forms of repetitive thought, including savoring, with sleep-related experiences and to examine the potential differential function and effects of savoring across the adult lifespan. Experimental and intervention research will provide insight into the utility of including savoring techniques in behavioral sleep interventions for younger, middle-age, and older adults.

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Clinical Implications

- Individuals' engagement in savoring and rumination should be considered when assessing sleep disturbance and sleep-related functioning across adult ages.
- Our observational findings provide rationale for future experimental and interventional work examining savoring as a potential adjunct to existing behavioral sleep treatments or as a sleep health promotion tool.

Table 1

Participant Demographics and Characteristics (N = 216)

Variable	n (%)
Female sex	120 (57.7)
Age	
18-29 years old	44 (20.4)
30-39 years old	46 (21.3)
40-49 years old	42 (19.4)
50-64 years old	43 (19.9)
65 years old	41 (19.0)
Race	
White or Non-Hispanic	170 (78.7)
Black or African American	16 (7.4)
Hispanic or Latino	7 (3.2)
Asian or Pacific Islander	9 (4.2)
Other	5 (2.3)
Missing	9 (4.2)
Variable	M (SD)
Years of education	15.4 (2.4)
Number of physical health conditions	.79 (1.25)
Self-rated mental health ^a	51.15 (11.50)

^aScores are T-scores; higher scores are indicative of better self-rated mental health

Table 2

Means, Standard Deviations, and Intercorrelations of Savoring, Rumination, Sleep Disturbance and Sleep-related Impairment Variables

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.
1. Savoring	32.15	27.67	--	--	--	--
2. Rumination	75.41	31.98	-.34**	--	--	--
3. Sleep disturbance	46.98	11.26	-.33**	.49**	--	--
4. Sleep-related impairment	48.29	12.66	-.37**	.59**	.83**	--

**
p < .001.

Table 3

Hierarchical Multiple Regression of Sleep Disturbance on Savoring, Rumination, and Covariates (N = 200)

Predictor	R^2	R^2_{adj}	B	$SE B$	β
Step 1	.32**	.30			
Step 2	.06**	.36			
Age			0.01	0.05	.01
Sex			2.18	1.37	.10
Income adequacy			0.02	1.42	.00
Number of physical health conditions			1.67*	0.58	.19
Self-rated mental health			-0.27*	0.08	-.28
Savoring			-0.03	0.03	-.08
Rumination			0.10**	0.03	.28

Note. B = unstandardized regression coefficients; β = standardized regression coefficients.

* $p < .05$.

** $p < .001$.

Table 4

Hierarchical Multiple Regression of Sleep-Related Impairment on Savoring, Rumination, and Covariates (N = 200)

Predictor	R^2	R^2_{adj}	B	$SE B$	β
Step 1	.34**	.32			
Step 2	.11**	.43			
Age			-0.05	0.05	-.06
Sex			3.69*	1.43	.15
Income adequacy			0.55	1.48	.02
Number of physical health conditions			1.96*	0.61	.20
Self-rated mental health			-0.18*	0.08	-.17
Savoring			-0.07*	0.03	-.15
Rumination			0.15**	0.03	.38

Note. B = unstandardized regression coefficients; β = standardized regression coefficients.

* $p < .05$.

** $p < .001$.