

University of Louisville

## ThinkIR: The University of Louisville's Institutional Repository

---

Electronic Theses and Dissertations

---

12-2022

### Age-related differences in the relationship between activity familiarity and well-being.

S. Kelly Shryock  
*University of Louisville*

Follow this and additional works at: <https://ir.library.louisville.edu/etd>



Part of the [Geropsychology Commons](#)

---

#### Recommended Citation

Shryock, S. Kelly, "Age-related differences in the relationship between activity familiarity and well-being." (2022). *Electronic Theses and Dissertations*. Paper 4020.  
Retrieved from <https://ir.library.louisville.edu/etd/4020>

This Doctoral Dissertation is brought to you for free and open access by ThinkIR: The University of Louisville's Institutional Repository. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of ThinkIR: The University of Louisville's Institutional Repository. This title appears here courtesy of the author, who has retained all other copyrights. For more information, please contact [thinkir@louisville.edu](mailto:thinkir@louisville.edu).

AGE-RELATED DIFFERENCES IN THE RELATIONSHIP BETWEEN ACTIVITY  
FAMILIARITY AND WELL-BEING

By

S. Kelly Shryock  
B.A. Centre College, 2004  
M.A. University of Northern Colorado, 2007

A Dissertation  
Submitted to the Faculty of the  
College of Arts and Sciences at the University of Louisville  
in Partial Fulfillment of the Requirements  
for the Degree of

Doctor of Philosophy  
in Clinical Psychology

Department of Psychological & Brain Sciences  
University of Louisville  
Louisville, Kentucky

December 2022



AGE-RELATED DIFFERENCES IN THE RELATIONSHIP BETWEEN ACTIVITY  
FAMILIARITY AND WELL-BEING

By

S. Kelly Shryock  
B.A. Centre College, 2004  
M.A. University of Northern Colorado, 2007

A Dissertation Approved on

September 6, 2022

by the following Dissertation Committee:

---

Suzanne Meeks, Ph.D.

---

Benjamin Mast, Ph.D.

---

Richard Lewine, Ph.D.

---

Barbara Stetson, Ph.D.

---

Heehyul Moon, Ph.D., MSW

## ABSTRACT

### AGE-RELATED DIFFERENCES IN THE RELATIONSHIP BETWEEN ACTIVITY FAMILIARITY AND WELL-BEING

S. Kelly Shryock

September 6, 2022

**Background and Objectives:** This study explored age-related differences in the relationship between activity novelty/familiarity and well-being, conceptualized within theories including Selection, Optimization, and Compensation (SOC), Self-Determination Theory (SDT), and Socioemotional Selectivity Theory (SST). For all ages, participation in activities has been shown to enhance well-being. Known mediators of this relationship include psychological, physical, and psychosocial benefits. It is less clear what types of experiences are optimal across the lifespan.

**Research Design and Methods:** A online cross-sectional, correlational study ( $N= 200$ ) was conducted. Measures included demographic data, ratings of three self-identified recent activities, three activity choices of familiar or novel activity options, measures of well-being, and control variables including measures of overall activity level, physical health, personality traits, and COVID-19 stress.

**Results:** An 8-item familiarity scale was developed and validated. Chronological age was not correlated with familiar activity choice. However, age was significantly positively

correlated with mean ratings of activity familiarity. Age did not moderate the relationship between the familiarity of activity and eudaimonic well-being as hypothesized. Overall activity level had a significant direct effect on hedonic well-being and hedonic well-being had a significant direct effect on eudaimonic well-being, but there was no direct effect of overall activity level on eudaimonic well-being. Ratings of activity familiarity were significantly positively related to ratings of activity automaticity, and mean familiarity ratings across three self-identified activities were significantly negatively related to extraversion. Controlling for negative impacts of the COVID-19 pandemic using the COVID Stress Scales did not improve model fit for any of the analyses.

Discussion and Implications: This study highlights the complexity of research on activity participation and preferences, and the need for use of techniques such as ecological momentary assessment, qualitative research, and longitudinal studies to better capture complex constructs such as activity familiarity and participation. Future research on age-related differences in the relationship between activity familiarity and well-being may contribute to a lifespan theory of activity benefits and will be useful in personalizing interventions that increase well-being, such as weighting selection of activities in behavioral activation treatments or designing activity programs for older adults.

## TABLE OF CONTENTS

	PAGE
ABSTRACT .....	iii
LIST OF TABLES .....	ix
LIST OF FIGURES .....	xi
INTRODUCTION AND LITERATURE REVIEW.....	1
Introduction.....	1
Literature review.....	3
Well-being.....	3
Measurement of Well-being.....	5
Evidence that Activities Promote Well-being.....	7
Behavioral Activation.....	7
Personalized Activity Interventions.....	9
Leisure Studies.....	11
Flow.....	15
Measurement of Flow.....	16
Research on Flow and Well-being.....	18
Neurological and Cognitive Change Across the Lifespan.....	20
Neuroanatomical Change.....	20
Executive Functioning.....	21
Attention and Cognitive Processing.....	22

Personality and Novel/Familiar Experience.....	23
Subjective Age.....	24
Theories and Models of Aging.....	25
Theory of Selection, Optimization, and Compensation.....	25
Self-Determination Theory.....	27
Socioemotional Selectivity Theory.....	28
Summary.....	31
Aims.....	33
METHODS AND MATERIALS.....	38
Design.....	38
Measures.....	39
Measure of Novelty/Familiarity.....	39
Familiar Activity Preference.....	40
Measures of Well-being.....	41
Control Variables.....	42
Procedures.....	43
Participants.....	44
Analysis.....	47
Familiarity Scale Development.....	48
Hypotheses.....	48
Power.....	49
RESULTS .....	50
Pilot Study.....	50



Familiarity Scale Development.....	50
Hypothesis 1 & Related Exploratory Hypothesis.....	52
Hypothesis 2.....	55
Hypothesis 2a.....	56
Hypothesis 2b & Related Exploratory Hypothesis. ....	57
Hypothesis 2c & Related Exploratory Hypothesis. ....	60
Hypothesis 2d & Related Exploratory Hypothesis. ....	64
Exploratory Hypothesis.....	65
COVID Stress Scales.....	65
DISCUSSION .....	71
Summary and Conclusions .....	71
Familiarity Scale Development.....	71
Hypothesis 1 & Related Exploratory Hypothesis.....	71
Hypothesis 2.....	73
Hypothesis 2a.....	73
Hypothesis 2b & Related Exploratory Hypothesis. ....	74
Hypothesis 2c & Related Exploratory Hypothesis. ....	75
Hypothesis 2d & Related Exploratory Hypothesis. ....	75
Exploratory Hypothesis.....	76
COVID Stress Scales.....	76
Limitations.....	77
Future Directions.....	78
REFERENCES.....	81

APPENDICES.....	100
Appendix A: Measures of Well-being.....	100
Appendix B: Activity Ratings.....	106
Appendix C: Attention Checks.....	110
Appendix D: Demographic Data, Physical Health, and Personality Traits.....	111
Appendix E: Informed Consent .....	114
Appendix F: Exploratory Hypothesis Descriptive Statistics and Pearson Correlations.....	115
CURRICULUM VITAE .....	116

## LIST OF TABLES

TABLE	PAGE
1. Sociodemographic Characteristics of Participants.....	46
2. Age as a Predictor of Activity Choices.....	53
3. Coefficients of the Model Predicting Activity Choice 1 (95% BCa bootstrap confidence intervals based on 1000 samples in brackets).....	54
4. Mean Activity Familiarity and Age Pearson Correlations.....	54
5. Test of Hypothesis 2: Multiple Linear Regression of Eudaimonic Well-being onto Age, Familiarity, and Interaction of Age and Familiarity.....	55
6. First Activity Descriptive Statistics and Pearson Correlations for H <sub>2b</sub> .....	57
7. Second Activity Descriptive Statistics and Pearson Correlations for H <sub>2b</sub> .....	57
8. Third Activity Descriptive Statistics and Pearson Correlations for H <sub>2b</sub> .....	58
9. First Activity Descriptive Statistics and Pearson Correlations for H <sub>2b</sub> by Age Group.....	58
10. Second Activity Descriptive Statistics and Pearson Correlations for H <sub>2b</sub> by Age Group.....	59
11. Third Activity Descriptive Statistics and Pearson Correlations for H <sub>2b</sub> by Age Group.....	59
12. First Activity Descriptive Statistics and Pearson Correlations for H <sub>2c</sub> .....	60
13. Second Activity Descriptive Statistics and Pearson Correlations for H <sub>2c</sub> .....	61

14. Third Activity Descriptive Statistics and Pearson Correlations for H <sub>2c</sub> .....	61
15. First Activity Descriptive Statistics and Pearson Correlations for H <sub>2c</sub> by Age Group.....	62
16. Second Activity Descriptive Statistics and Pearson Correlations for H <sub>2c</sub> by Age Group.....	63
17. Third Activity Descriptive Statistics and Pearson Correlations for H <sub>2c</sub> by Age Group.....	63
18. CSS Pearson Correlations with Study Variables.....	66
19. Hypothesis 1 Revisited: Controlling for COVID Stress Scales Contamination and Checking with Chronological Age.....	67
20. Hypothesis 1 Revisited: Controlling for COVID Stress Scales Contamination and Checking with Subjective Age.....	68
21. Hypothesis 2 Revisited: Multiple Linear Regression of Eudaimonic Well-being onto Age, Familiarity, and Interaction of Age and Familiarity, Controlling for COVID Stress Scales Danger, Contamination, and Checking.....	69

## LIST OF FIGURES

FIGURE	PAGE
1. The original model of the flow state.....	16
2. Age Moderates the Relationship between Activity Familiarity/Novelty and Well-being.....	33
3. Moderating Effect of Age on the Relationship between Familiarity of Activity and Well-being for Younger and Older Adults.....	34
4. Hedonic Well-being Mediates the Relationship Between Overall Activity Level and Eudaimonic Well-being.....	35
5. The Relationship between Activity Familiarity and Well-being, Controlling for the Impact of Physical and Social Activity Level.....	36
6. The Relationship between Activity Familiarity and Well-being, Controlling for the Impact of Overall Activity Level.....	36
7. Participant Recruitment Diagram.....	45
8. Total Household Income per Year .....	46
9. Model of Overall Activity as a Predictor of Eudaimonic Well-being, Mediated by Hedonic Well-being.....	56
10. Hypothesis 2a Revisited: Model of Overall Activity as a Predictor of Eudaimonic Well-being, Mediated by Hedonic Well-being and Controlling for COVID Stress Scales Danger, Contamination, and Checking.....	70

CHAPTER 1  
INTRODUCTION AND LITERATURE REVIEW

**Introduction**

Activity engagement is known to promote well-being; psychological, physical, and psychosocial benefits are among the known mediators of this relationship in all age groups. It is less clear what types of experiences are optimal at different points in the lifespan. A better understanding of the interaction between individual characteristics and qualities of activities, including the level of novelty or familiarity of an activity, is needed to hone the application of the existing knowledge linking activity participation with well-being.

Participation in activities provides opportunities to experience engagement, meaning, and pleasure, leading to improved well-being (Schueller & Seligman, 2010). Physical activities are known to provide health benefits across the lifespan (Warburton, Nicol, & Bredin, 2006). Older adults with high levels of purposeful engagement experience health benefits such as reduced risk for disease, increased longevity, better physiological regulation, and decreased inflammation (Ryff, Heller, Schaefer, Van Reekum, & Davidson, 2016). In addition to the psychological and physical health benefits, participation in activities can provide psychosocial benefits including increased

emotional support and connectedness, and decreased loneliness (Huxhold, Fiori, & Windsor, 2013; Joiner, Lewinsohn, & Seeley, 2002).

We found evidence of age differences in the response to novel/familiar activities in a recent study examining theatre involvement and well-being in adult theatre attendees (Meeks, Shryock, and Vandenbroucke, 2017). Theatre involvement was associated indirectly with satisfaction and enjoyment, hedonic well-being, and social functioning, through measures of flow, social engagement, and belonging. Examination of age differences in the model revealed that younger adults demonstrated a negative relationship between attendance and theatre benefit, while older adults showed a positive relationship; for younger adults, less frequent attendance was related to greater benefit from the theatre experience, while increased attendance was related to greater benefit in older adults. This finding suggests that there may be age-related differences in the relationship between activity novelty/familiarity and how participation in the activity impacts well-being.

The present study explored age-related differences in the relationship between activity novelty/familiarity and well-being. While a higher general activity level can be expected to predict increased well-being, I hypothesized that selection of and benefit from activities would vary based on activity familiarity and age. I predicted that older adults would express greater preference for and experience a stronger effect on well-being from familiar activities, while younger adults would prefer and experience a stronger effect on well-being from activities that are novel or provide knowledge.

## **Literature Review**

The following literature review defines the constructs of well-being and familiarity and reviews research related to behavioral activation, personalized activity interventions for individuals with dementia, leisure studies, flow, neuropsychology, personality, and theories of aging to provide broad support for age-related differences in preferences for and benefit derived from the novelty/familiarity of activities. Aspects of aging that may partially account for these differences include physical health, neurocognitive changes, social and vocational changes, subjective age, and variations in personality traits.

### **Well-being**

This study explored the impact of variations in familiarity of activities on well-being across adult age ranges. Well-being is a complicated and nuanced construct, which depends upon numerous individual characteristics and trajectories of change, and is entwined with each person's context and perceptions. Benefits derived from participation in activities occur within the broader context of lifelong experiences, characteristics, and preferences (Crawford, Godbey, & Crouter, 1986; Iso-Ahola, Jackson, & Dunn, 1994; Nimrod, 2007), but also within the context of short term variations in health (Rathouz et al., 1998), mood (Neiss & Almeida, 2004), capacity (Martin & Hofer, 2004), and preference (Crawford, Godbey, & Crouter, 1986). The complex and varied nature of well-being provides challenges for conceptualization and measurement.

Well-being can be viewed using either a hedonic or eudaimonic perspective; hedonic well-being is defined as the presence of positive affect and the absence of negative affect, while eudaimonic or psychological well-being is characterized by the



process of living well and optimizing potential (Deci & Ryan, 2008; Ryan & Deci, 2001). Hedonic well-being may be understood as happiness or short-term affective well-being, while eudaimonic well-being focuses on enduring life challenges and the realization of one's true potential (Ryff, 1989). Psychological research typically uses measures related to happiness to measure hedonic well-being, including life satisfaction, presence of positive mood, and absence of negative mood (Ryan & Deci, 2001). Eudaimonic well-being is commonly evaluated using the following six constructs: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (Ryff, 1989).

There is debate about the overall structure of well-being, including what components make up well-being and whether the eudaimonic constructs hypothesized by Ryff foster well-being or are the factors that define what well-being is (Ryan & Deci, 2001). Contradictory research conceptualizes hedonic and eudaimonic aspects of well-being as overlapping constructs (Disabato, Goodman, Kashdan, Short, & Jarden, 2016) or as related, but distinct factors (Joshani, 2016). The broaden-and-build theory of positive emotions (Fredrickson, 2001) theorizes that positive emotions serve to provide both short term experiences of pleasure or hedonic well-being and long term gains in growth or eudaimonic well-being, as positive emotions prime the growth of beneficial individual characteristics. Consistent with this theory, Fredrickson and Joiner (2002) found positive affect and broad-minded coping to enhance one another across time. Broaden-and-build theory further suggests that a positive affect balance or high positivity ratio works to counteract the adverse effects of negative emotions (Fredrickson et al., 2000; Fredrickson & Losada, 2005; Garland et al., 2010). Hedonic well-being, including

measures of positive affect and affect balance, has been shown to provide immediate benefits and to promote development of eudaimonic well-being.

Not all hedonic well-being relates to eudaimonic well-being; some conditions that enhance happiness have been shown to decrease eudaimonic well-being, and some conditions that enhance eudaimonic well-being may actually decrease happiness in the short term (Ryan & Deci, 2001). Sheldon, Corcoran, and Prentice, (2019) found that goals related to increasing eudaimonic functioning were related to both concurrent and future improvements in eudaimonic well-being, whereas goals related to happiness were ineffective in promoting enhanced subjective well-being, both concurrently and over time. This suggests that promotion of well-being is most likely to be successful when eudaimonic aspects of well-being are targeted, such as through participation in personalized activities that enhance meaning and accessing individual potential. Aspects of activity that most efficaciously enhance eudaimonic well-being can be expected to vary across the lifespan.

### **Measurement of Well-being**

Measurement of well-being requires a careful consideration of techniques and tools. Well established measures of hedonic well-being in adults include the Satisfaction with Life Scale (SWLS) (Diener et al., 1985) and the Positive and Negative Affect Schedule (PANAS) (Crawford & Henry, 2004; Watson et al., 1988). The SWLS focuses on global life satisfaction and demonstrates good internal reliability and moderate temporal reliability (Pavot, 2018; Pavot & Diener, 2009). The SWLS has been used in thousands of studies and in more than 30 languages (Pavot, 2018). The PANAS, which consists of ratings of the degree to which 10 positive and 10 negative emotions are

experienced, is considered a reliable and valid measure of positive and negative emotion (Crawford & Henry, 2004). However, the PANAS has been criticized for over-emphasizing intense emotion and inclusion of adjectives that do not indicate emotion solely (Pavot, 2018). The Scale of Positive and Negative Experience (SPANE), a newer measure of positive and negative feelings, was developed to measure a range of arousal levels and to target feelings specifically (Diener et al., 2010). The 12-item SPANE collects ratings of the frequency of feelings and demonstrates strong psychometric performance and may provide unique variance when used alongside the PANAS (Jovanovic, 2015; Rice & Shorey-Fennell, 2020).

Eudaimonic well-being is frequently measured using a version of the Psychological Well-being Scale (PWS) (Ryff, 1989). The PWS were originally developed with 120 items, and have been used in versions with 84, 54, 42, 24 and 18 items, all divided into six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. The longer versions of the scales demonstrate better internal consistency, while the shorter versions typically have better factorial validity (Van Dierendonck, 2004). The 42-item PWS performs with acceptable internal consistency and reasonable factorial validity across age-groups (Shryock & Meeks, 2018).

These measures are all evaluations of subjective well-being (SWB), or estimations of the subjective quality of an individual's own life (Diener et al., 2018). SWB is frequently used as a surrogate for measurement of the larger concept of well-being, as even the most comprehensive objective measures of well-being are presumed to lack the power of individual perspective and interpretation inherent in SWB (Diener et

al., 2018). Measurement of well-being can be challenging due to factors beyond the control of most research studies: transient mood states and situational factors can influence responses on measures of SWB (Pavot, 2018). These transient factors have been generally shown to have minimal influence on group SWB and randomizing survey order is helpful in diminishing the effect that previous survey items may have on SWB responses (Pavot, 2018). Well-being is a complex and highly individualized concept; current research supports use of a combination of both hedonic and eudaimonic aspects of well-being.

### **Evidence that Activities Promote Well-being**

There are psychological, physical, and psychosocial benefits to activity participation across the lifespan. Treatments designed to enhance activity participation are well established, including behavioral activation for individuals with and without depression and personalized activity interventions for individuals with dementia.

#### **Behavioral Activation**

Participation in pleasant activities has been shown to be related to improved mood in individuals diagnosed with clinical depression; behavioral psychotherapy was developed by Lewinsohn and colleagues in the 1970's and was based on a view of depression as a result of "a broad deprivation of positive reinforcement" (Kanter, Psupitasari, Santos, & Nagy, 2012, p. 361). Behavioral activation (BA) involves identifying and scheduling pleasurable activities with the goal of increasing opportunities for positive reinforcement and increasing the likelihood that healthy behaviors will occur. BA has been widely studied and has been shown to be an effective treatment for depression, across many settings and with many populations (Kanter, et al, 2012;

Mazzucchelli, Kane, & Rees, 2010). This treatment has been shown to be flexible, adaptable, acceptable, and portable and is widely accepted as a gold standard treatment for depressive disorders. The American Psychological Association (2006) designated BA for depression as having strong research support and described important aspects of BA as decreasing withdrawal and increasing pleasant experiences, social interactions, and opportunities to experience mastery. What constitutes a pleasant activity varies widely by individual and little guidance is available as to the types of activities that are likely to provide the most benefit.

Mazzucchelli, Kane, & Rees (2010) contended that activities that are effortful, intentionally selected, and match individual values and interests work to promote a happy life by incorporating positive emotion, engagement, and meaning. In their meta-analysis, Mazzucchelli and colleagues found that BA showed promise for increasing well-being in individuals both with and without elevated depressive symptoms. This meta-analysis was limited by a small number of existing studies examining well-being in groups without clinical depression, short study durations, limited follow up to examine sustainability of the effects of BA, and inconsistent means of measuring well-being. However, the research reviewed suggests that engaging in pleasant activities could improve well-being in the general population and provides further theoretical support for the utility of activities that are personalized based on individual characteristics. Understanding of age-related differences in the relationship between activity novelty/familiarity and well-being could provide direction for selection of activities in BA. This guidance could be particularly useful for guiding activity selection in individuals with limitations of time, energy, or financial resources.

## **Personalized Activity Interventions for Individuals with Dementia**

As noted, an important aspect of effective BA is that the activities are a match for the values and interests of an individual. Person centered care (PCC) is a philosophy of care which focuses on the person's point of view, and which incorporates individual preferences, desires, needs, values, and circumstances in structuring treatment and caregiving (Fazio, Pace, Flinner, & Kallmyer, 2018). Within the context of PCC personalized activities have been studied as a treatment for agitation in individuals with dementia (Cohen-Mansfield, Libin, & Marx, 2007; Gitlin et al., 2008; Kolanowski, Litaker, Buettner, Moeller, & Costa, 2011).

In a placebo-controlled study of 167 nursing home residents with dementia, Cohen-Mansfield, Libin, and Marx (2007) tailored interventions using an algorithm that considered type of agitation and unmet needs, along with individual cognitive, physical, and sensory abilities and lifelong habits and roles. They found that these personalized interventions resulted in significant decreases in overall agitation and increases in pleasure and interest. Limitations to this study included constraints related to the nursing home setting, including availability and feasibility of environmental modifications or unique materials and staff cooperation, and assignment of facilities instead of individuals to the treatment or control condition. Assignment of facilities allows for comparison to a control group; however, results are possibly confounded by characteristics of the facilities. Consideration of lifelong habits and roles in tailoring interventions provides opportunity for inclusion of familiar activities and is consistent with the hypothesis that older adults experience increased well-being with participation in familiar activities.

In a sample of 60 individuals with dementia and their caregivers, Gitlin and colleagues (2008) tested the Tailored Activity Program (TAP), which identifies preserved capabilities and previous roles and interests in order to devise activities that build on these areas. They hypothesized that participation in tailored activities would reduce behavioral symptoms of dementia, by enabling positive expression, maintaining roles, promoting identity continuity, connectedness, and belonging, minimizing frustration, providing positive engagement and self-actualization, and reducing allostatic load or stress responses. This study found that TAP reduced the frequency of problem behaviors and increased activity engagement in the individuals with dementia, while also reducing the amount of time caregivers reported being on duty and increasing caregiver report of mastery, self-efficacy, and skills. The study was limited by a reliance on caregiver reporting and did not provide a control condition for the time and attention from the interventionists. Consideration of previous roles and interests provides a broad view of individual characteristics, interests, and strengths. These tailored activities were found to be useful for both individuals with dementia and their caregivers, providing support for the benefit of familiar activity for older adults.

Kolanowski, Litaker, Buettner, Moeller, and Costa (2011) tested the effect of three weeks of twice daily activities identified using the Need-Driven Dementia-Compromised Behavior Model, in a sample of 128 nursing home residents with cognitive impairment. In this randomized double-blind clinical trial, participants were assigned to activities tailored to their functional level (FL), personality style of interest (PSI), FL and PSI, or active control. Dependent variable measurement took place during baseline, intervention, random times outside of treatment, and 1 week after the intervention

concluded. Individuals in the PSI group demonstrated greater engagement, alertness, and attention, the FL+PSI group showed greater pleasure, and the PSI and FL+PSI groups displayed less agitation and passivity. After treatment was withdrawn, pleasure decreased, but mood, anxiety, and passivity remained above baseline levels. Personality style of interest was found to be the most effective component of treatment. This suggests that assessment of personality traits provides a complementary tool for identifying activities that are consistent with individual characteristics.

These three studies of activity interventions for individuals with cognitive impairment (Cohen-Mansfield et al., 2007; Gitlin et al., 2008; Kolanowski et al., 2011) demonstrate the utility of activities that are personalized based on the ability, lifelong interests, and personality of the individual and provide support for the hypothesis that older adults may receive a greater benefit from activities high in familiarity.

### **Leisure Studies**

The field of leisure studies provides additional support for the link between activity familiarity and well-being, as well as insight into how this relationship may differ by age. A review of social and leisure activity and well-being in older adults found that studies generally showed positive associations between activity and well-being, health, and survival (Adams, Leibbrandt, & Moon, 2011). Adams and colleagues pointed out that social activities showed the strongest association with well-being and noted the difficulty in untangling the “reciprocal effects between social participation and health or well-being” in both longitudinal and cross-sectional studies (2011, p. 702). They reported the following moderating factors in the studies they reviewed: gender, widowhood, functional limitations, family support, age (through mobility and illness),



amount of time spent alone, neuroticism, depression, and retirement status. Mediating factors included: purpose or motivation, personal mastery, social self-concept, mobility, appraisals of social activity, choice, and perceived quality of the activity. Mastery, choice, and perceived quality may be factors related to familiarity of an activity and widowhood, functional limitations, mobility, illness, and retirement status may be related to chronological age. The authors called for standardizing definitions and measures of activity and well-being, as well as increased examination of the impact of purpose, context, and demand. This review provides further confirmation of the benefits of leisure activities and a useful overview of the moderating and mediating factors of the relationship between leisure activity participation and well-being. It will be important to examine variations in the hypothesized models by demographic characteristics and to examine facets related to aging such as physical health, marital relationships, and vocational status.

Zawadzki, Smyth, and Costigan (2015) studied the association between leisure activities and health and well-being using ecological momentary assessments, six times per day for three days, along with cortisol samples and heart rate monitoring. They found that while engaging in leisure activities, participants had more positive and less negative mood, more interest, less stress, and lower heart rate than when not, providing evidence of the immediate benefits of participation in leisure activities. This study is limited by use of single items to assess positive mood, negative mood, and interest, and lack of measure of the type of leisure activity being done (participants simply indicated if they were participating in a leisure activity or not). Additionally, the sample was primarily white, female, and had some college education and all were employed full time, limiting

the generalizability of these findings. While this study did not examine the novelty/familiarity of activities, it lends additional support for the psychological and physical benefits of leisure activities.

An eight-year longitudinal study of Taiwanese adults age 70 and above (n=1268) examined frequencies of physical and sedentary leisure activity and life satisfaction (Ku, Fox, & Chen, 2016). Higher frequency of both types of leisure activity were found to be associated with higher life satisfaction, in the overall sample and when adults with cognitive decline were excluded from the analysis (Ku et al., 2016). Limitations to this study include small effect sizes, a significant association between number of chronic diseases and symptoms of depression with life satisfaction, only nine possible activity choices, and use of a single measure of life satisfaction. This longitudinal study provides some evidence that the relationship between activity participation and well-being persists cross-culturally and is sustained in both physical and sedentary activities. It further calls attention to the complicating effects of both physical and emotional health.

Oerlemans, Bakker, & Veenhoven (2011) utilized data from an ongoing longitudinal study of older adults in the Netherlands (n=438) to examine activity participation, personality characteristics, and happiness. They found that the combination of effortful social, physical, cognitive, and household activities with restful activities was related to increased happiness, that social activity participation mediated the relationship between extraversion and happiness, and that high extraversion was related to greater happiness from social activities as compared to low extraversion individuals. As with the study by Ku and colleagues (2016), results from this study are limited by use of narrow measures of personality and happiness; a brief personality measure only measured

extraversion and neuroticism and a measure of happiness was the only outcome.

Oerlemans and colleagues' work provides support for the value of a range of activity types and the importance of personality characteristics on activity selection.

Janke, Son, and Payne (2009) utilized a cross-sectional analysis to examine the effects of arthritis on leisure involvement and physical, emotional, and social health. They used a modified version of The Measurement of Selection, Optimization, and Compensation by Self-Report (Baltes, Baltes, Freund, & Lang, 1999) to examine how participants chose leisure activities and any adaptations or modifications they made due to arthritis. Janke and colleagues measured health and well-being using the Arthritis Impact Measurement Scale and examined the control variables of age, sex, and marital status. This study found that participants used strategies to adapt and self-regulate their leisure activities and that all but loss-based selection were associated with positive health outcomes. Use of strategies was found to vary by resources and marital status. Janke and colleagues acknowledged that their findings are limited by use of a convenience sample of mostly white, unmarried females and the cross-sectional nature of their data. This study represents examination of a population experiencing potential limitations due to a medical condition and the results suggest that use of these strategies is adaptive and may provide benefits for physical, emotional, and social health. Changes in health may require use of adaptive strategies in order to sustain participation in familiar activities.

As identified by Janke and colleagues, socioeconomic and marital status may influence the availability and desirability of activities. Race and ethnicity are additional important considerations when examining choice and preference of activities. While research related to race or ethnicity in leisure studies continues to grow, it accounts for a

small sub-section of the literature (Floyd, Bocarro, & Thompson, 2008). Related considerations for further study include the role of post-immigration assimilation/adaptation, perceived discrimination, and minority-specific leisure constraints (Stodolska & Walker, 2007). It is currently unclear how these factors interact with age, activity novelty/familiarity, and well-being; future research is needed in diverse populations to explore these interactions.

Research on leisure studies highlights the importance of examination of demographics, social and vocational aspects related to aging, and personality on the relationship between activity familiarity and well-being. Continuity of experience with an activity may be enhanced by modifying how the activity is performed, as physical health changes across the lifespan.

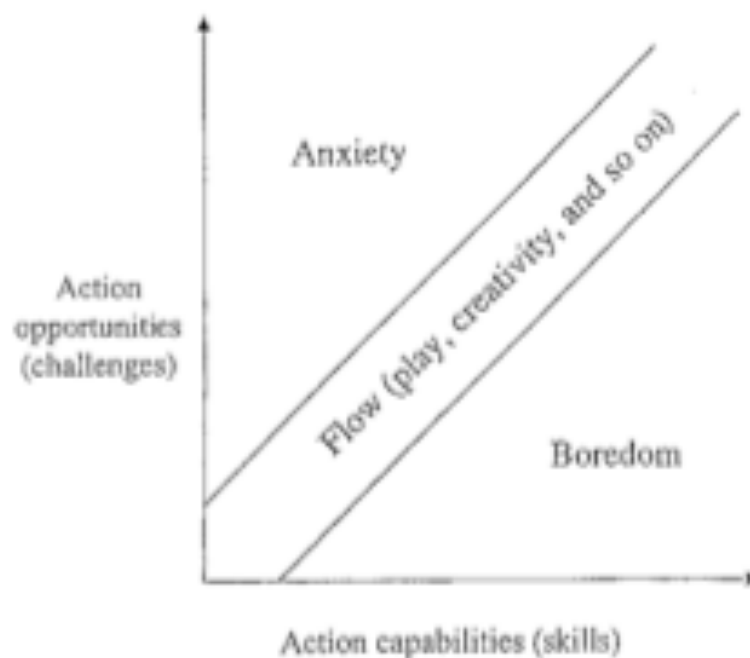
### **Flow**

The value of personalized activities can be further conceptualized using the concept of flow. Flow states occur during activities that are intrinsically interesting and provide an optimal level of challenge for an individual's skills (Nakamura & Csikszentmihalyi, 2001). The state of flow is a subjective state in which an individual is operating at full capacity and experiences intense concentration, is not consciously evaluating their actions, feels a sense of control and mastery of the activity, feels like time is passing more quickly than normal, and experiences the activity itself as being rewarding, irrespective of the outcome or any results of the activity. During flow, previous acquisition of skills interacts with the environment and continuation of the flow state is contingent upon the activity holding the attention of the individual (Nakamura & Csikszentmihalyi, 2001). Experience of a flow state is contingent upon the match

between individual abilities and the challenges of the activity; if the challenge of the activity exceeds the skill of the individual, anxiety is experienced, while if the challenge is too low, boredom is likely to occur, see Figure 1 (Della Fave & Massimini, 2005; Nakamura & Csikszentmihalyi, 2001).

**Figure 1.**

*The original model of the flow state.*



*Note.* From Nakamura and Csikszentmihalyi (2014, p. 94).

**Measurement of Flow**

Flow is a subjective experience, and as such, is investigated using self-report measures. Flow has been measured using interviews, paper and pencil measures, and the Experience Sampling Method (ESM) (Nakamura & Csikszentmihalyi, 2014). Semi-structured interviews have been used to gain descriptive understanding of flow

experiences and ask participants about their experience of flow states and factors that encourage or discourage the experience (Nakamura & Csikszentmihalyi, 2014).

Many self-report or paper and pencil measures of flow have been developed. Jackson, Martin, and Eklund (2008) developed a suite of scales designed to measure dispositional and state levels of flow in long, short, and core versions. The dispositional flow scales were designed to measure the frequency of flow experiences within a particular domain such as a sport, work, or school. State level flow scales measure the extent of flow experienced in a single event or activity, such as a competition, a work assignment, or an exam. Core flow scales focus on how it feels to be in a flow state. Other measures of flow include the Flow Questionnaire, which describes flow states and asks participants about how often and in what activities they have experienced flow, the Flow Scale, which estimates the frequency of flow experiences across activities (Nakamura & Csikszentmihalyi, 2014), and the Flow Experiences Scale, which is a brief measure of eight elements of flow experienced within an identified activity (Waterman et al., 2006). The Flow Experiences Scale has been used to study flow in young adults (Schwartz, 2006; Schwartz & Waterman, 2006; Waterman et al., 2003), and Greek and Italian adults (Bonaiuto et al., 2016), all with good internal consistency. A recent positive psychology blog post (Lonczak, 2019) listed over 20 scales that have been developed to measure the experience of flow states, including scales designed for specific activities such as work (Bakker, 2008; Seppälä et al., 2009) and computer games (Choi & Kim, 2004; Brockmeyer et al., 2009).

Interviews and questionnaires are limited by their reliance on memory and the ability to estimate the frequency and intensity of experiences. In the 1970's, researchers

developed ESM to sample momentary experiences, using technology to signal participants to document their activities and relevant states; a quasi-random schedule of data collection over a week or more is typical of these methods (Nakamura & Csikszentmihalyi, 2014). Flow research has employed ESM to identify moments when the conditions are favorable for flow, as well as for self-report of flow experiences. Interpretation of data collected using ESM should be guided by the possibility for self-selection bias, underreport or non-report of embarrassing or sensitive behaviors, the influence of the measurement procedure on the behaviors and emotions being measured, and consistency of ESM findings with those of other research methods (Larson & Csikszentmihalyi, 2014). The availability of a variety of methods and validated measures of flow provide options for research and the ability to tailor the choice of measurement to the research question.

### **Research on Flow and Well-being**

Della Fave and Massimini (2005) investigated the experience of flow or optimal experience and the reverse condition of apathy using the Experience Sampling Method in Italian medical school students (n=42), Italian high school students (n=60), Nepalese high school students (n=48), and Italian adults with a motor disability (n=35). They found that optimal experiences were not restricted to extreme or rare experiences and instead occurred in daily life, in activities related to work or study, leisure, and even in relaxed leisure activities such as watching television. The authors highlighted the contribution of and interplay between the desire to engage in an activity and the perceived relevance of the activity to future goals in both motivation and the meaningfulness of the activity; flow experiences are both pleasant in the moment and encourage an individual to return to the

activity (Della Fave & Massimini, 2005). This research suggests that flow or optimal experiences occur across a wide variety of daily experiences, including sedentary or passive activities such as watching television.

Flow states have been studied specifically in older adults. Payne, Jackson, Noh, and Stine-Morrow (2011) examined the nature of flow states in community dwelling older adults (n=197) in relation to individual cognitive ability. They coded activities as cognitive and noncognitive and found that individuals with higher fluid abilities experienced higher levels of flow in cognitive activities and lower levels of flow in noncognitive activities, while those with lower fluid abilities experienced higher levels of flow with noncognitive activities and lower levels of flow in cognitive activities. These findings are consistent with the conceptual definition of a flow state, requiring a match between individual skill or ability and the challenge of the activity and provide support for the usefulness of matching ability and activity in enhancing well-being.

The experience of flow has been found to be “the same across lines of culture, class, gender, and age, as well as across kinds of activity” (Nakamura & Csikszentmihalyi, 2001, p. 90) and the experience of flow states has been linked with increased well-being and decreased apathy (Della Fave & Massimini, 2005). The concept of flow provides a possible explanation of how or why participation in activities impacts well-being, through in-the-moment experiences of mastery and pleasure, and through the long-term effects on motivation and skill acquisition. It also lends further support to the utility of personalizing activities based on individual skills, interests, and experiences.



## **Neurological and Cognitive Change Across the Lifespan**

Cognitive ability is related not only to the experience of flow states, but to the availability, selection, and experience of pleasant activities. Degree and trajectory of change in cognitive abilities and brain structure vary across the lifespan; individual differences cannot be discounted in this arena. Advances in technology and understanding of the brain continue to reinforce the salience of these differences, but also are able to identify some general patterns of change that may be expected as individuals age.

### **Neuroanatomical Change**

One identified pattern of change involves structural changes in the brain across the lifespan. Fjell and Walhovd (2010) summarized evidence about age-related changes in the brain from magnetic resonance imaging (MRI) studies; in healthy aging, overall the volume of the brain shrinks, while the ventricular system expands. However, the pattern of change is highly varied and changes in brain volume are less related to neuronal loss and more related to “shrinkage of neurons, reductions of synaptic spines, and lower numbers of synapses” along with reduced length of myelinated axons (Fjell & Walhovd, 2010, p. 187).

In healthy aging, reductions in cognitive abilities such as executive functions, processing speed, and episodic memory occur; these changes are substantially mediated by neuroanatomical changes- explaining between 25-100% of differences in cognitive function when comparing young and old participants (Fjell & Walhovd, 2010). Critiques of MRI studies of aging point out that these studies are mostly cross-sectional, leading to explanations of possible age differences or cohort effects and not age changes.

Additionally, the limited number of longitudinal studies tend to have small sample sizes and are limited by participant attrition and rapid changes in technology, making comparison of MRI data over time challenging (Fjell & Walhovd, 2010). However, these studies provide broad support for structural brain changes in normal aging populations and related changes in cognitive functioning.

### **Executive Functioning**

One area of cognitive functioning that is known to decline in healthy aging is executive functioning. Executive functions (EFs) are control processes that regulate thoughts and behaviors. EFs include effortful cognitive functions such as selecting and monitoring behavior, resisting temptation, and maintaining attention (Diamond, 2013). EFs are important for maintaining independent functioning in older adults (Reuter-Lorenz, Festini, & Jantz, 2016). Consistent with the earlier conclusions of Fjell and Walhovd (2010) regarding individual variation of structural brain changes in older adults, Reuter-Lorenz, Festini, and Jantz (2016) noted individual differences in trajectories of change in EFs and memory in older adults, with as yet unanswered questions about why we differ so widely in how, when, and if these cognitive functions decline. EFs are largely mediated by the prefrontal cortex (Diamond, 2013). Brain changes are hypothesized to precede measurable changes on EF tasks and it has been shown that structurally the frontal lobes are likely more vulnerable to age-related changes (Fjell & Walhovd, 2010; Reuter-Lorenz et al., 2016). Healthy older adults may experience declines in executive functioning, related to structural changes in the brain, particularly in the frontal lobes. EFs are necessary for engagement in activities that require effortful

thought and concentration, and any cognitive decline will impact functioning during effortful activity participation.

Understanding of age-related changes in the structure and function of the brain continues to improve, but is limited by a lack of longitudinal studies of cognitive functioning across the lifespan. Individual differences in the trajectories of cognitive functioning are important in the overall understanding of cognitive aging, including understanding of protective and risk factors that influence their course. Changes in brain structure and related changes in cognitive functioning across the lifespan must be considered when broadly considering age-related changes in behavior, including participation in activities.

### **Attention and Cognitive Processing**

Attention to a task can be classified as involving control or automatic processing. Control processing is a part of executive functioning and occurs as individuals learn a new task or encounter a task with inconsistent parameters; it involves slow, effortful processing and is limited by capacity (Schneider, Dumais, & Shiffrin, 1984). Automatic processing typically develops over time, as individuals become familiar with a task and develop skilled behaviors; it is a fast and commonly effortless process and is not under direct control (Schneider et al., 1984). Tasks that engage the full capacity of an individual leave no room for perception of irrelevant distractors (Lavie, 2010). Overall processing capacity is expected to increase during childhood and decrease in old age; this reduced capacity has been shown to provide the benefit of decreasing distractibility. As individuals age, they may require a lower threshold of perceptual load to reach a focused state that limits their perception of distractors.

In familiar activities, individuals of any age are more likely to operate using automatic processing. A defining characteristic of flow states is that the individual is not engaged in self-monitoring and is unaware of distractions and time passing; flow states occur within activities with a high level of automatic processing. As individuals experience functional changes in capacity over the lifespan, it follows that familiar activities that draw on a higher proportion of automatic processing may be preferred. Neuroanatomical and cognitive changes in older adults provide additional understanding as to why older adults may prefer and benefit more from activities that are familiar.

### **Personality and Novel/Familiar Experience**

While personality traits are considered to be relatively stable across the lifespan, they show some patterns of variation that provide insight into how individuals respond to novelty or familiarity of experiences. Personality traits are individual characteristics that describe the ways that people think, feel, and behave, as well as how they are motivated. Modern examinations of personality trait stability over the lifespan include looking at both within-individual or rank order change and between-individual or mean-level change (Caspi, Roberts, & Shiner, 2005; Griffin, Mroczek, & Wesbecher, 2015). Personality traits increase in consistency as people age (Griffin et al., 2015). Test-retest correlations of rank-order of personality traits increase with age and are moderate across all age groups, 0.41 in childhood, 0.55 at age 30, and 0.70 age 50-70 (Caspi et al., 2005). As personality traits become more consistent with age, activities may be refined to encompass those that provide the best match for individual personality traits, preferences, and abilities.

Mean-level changes in personality traits provide insight into average trait levels across a population. The Big Five or Five Factor Model is a popular conceptualization of personality that has been studied extensively and includes the traits of extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness. Mean-level change has been studied for each of these traits. In particular, the between-individual changes in the traits of extroversion and openness to experience provide insight into the relationship between novelty/familiarity and well-being in older adults. *Extroversion* is related to traits of positive emotionality, sociability, high energy level, enjoyment of social attention, and sensitivity to reward; extraversion/social dominance increases up to age 40 and then stabilizes, while extraversion/social vitality declines slightly in young adulthood, stabilizes, and then declines in later life (Caspi et al., 2005; Griffin et al., 2015). Decreased reward sensitivity in older adults could help to explain why older adults prefer familiar activities, they may have less motivation to approach unknown activities and decreased reward enjoyment of these experiences. *Openness to experience* encompasses curiosity, creativity, sensitivity to aesthetic qualities, and quickness or cleverness; openness to experience shows a mild increase in young and middle adulthood and then declines in later life (Caspi et al., 2005; Griffin et al., 2015). Older adults may have lower levels of aspects of openness to experience such as curiosity, leading to less exploration of novel activities and lowered reactivity to novel experiences.

### **Subjective Age**

Chronological age, or amount of time since birth, may not be the most relevant measure of age in all studies. Adults often experience feeling either younger or older than their chronological age, a phenomenon referred to as subjective age (SA; Barrett &

Montepare, 2015). SA has been studied since the 1950s and has demonstrated correlations with physical health, health related behaviors, longevity, and emotional and psychological well-being (Barak & Stern, 1986; Montepare, 2018; Westerhof & Wurm, 2018; Wurm & Westerhof, 2015). In longitudinal studies, a lower SA has been shown to predict better health and well-being (Westerhof et al., 2014) and decreased mortality (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009). In older adults specifically, a lower SA has been shown to be related to better physical and emotional functioning (Westerhof & Wurm). Together, these findings suggest a bias toward lower SA may be an adaptive cognitive mechanism and SA may provide a meaningful, supplementary view of age.

### **Theories and Models of Aging**

Theories and models of aging that relate to activity participation and well-being include the theory of selection, optimization, and compensation, self-determination theory, and socioemotional selectivity theory. These theories provide a framework for viewing age related changes in the impact of novelty/familiarity of activity on well-being.

#### **The theory of selection, optimization, and compensation**

The theory of selection, optimization, and compensation (SOC) provides insight into how activities relate to well-being and why this relationship might differ across the lifespan. Intraindividual variability and intraindividual plasticity underlie Baltes & Baltes (1990) model of SOC. SOC describes how individuals adapt across the lifespan; selection encompasses a gradual restriction or specialization of domains of functioning, due to personal choice, experience, environmental exposure, or aging related losses of capacity, and may include adding new domains or adjusted existing domains (Baltes & Baltes,

1990). Elective Selection is guided by preference or social norms, while Loss-Based Selection occurs when resources are lost and may result in non-preferred outcomes (Baltes & Rudolph, 2012). Familiar activities have the benefit of prior experience, allowing for informed selection. Optimization includes the use of behaviors or tools in order to enhance or supplement retained capacity and may include increased practice, modeling successful others, and scheduling (Baltes & Baltes, 1990; Baltes & Rudolph, 2012). Optimization may include spending more time on an activity with age or scheduling an activity on days or times that coincide with increased capacity. Compensation includes use of new or unused resources such as the mind or technology to support maintenance of functioning as capacity changes (Baltes & Baltes, 1990; Baltes & Rudolph, 2012). Compensation strategies could include use of assistive devices or selection of environments that reduce distractions.

Paul Baltes (1997) argued that as genetic plasticity and biological potential decrease with age, cultural resources are needed at higher levels and the efficiency of these resources diminishes. Importantly, Baltes viewed successful development as “the relative maximization of gains and the minimization of losses” (p. 367) and noted that what is considered a loss or gain varies widely by individual, context, and condition. Baltes reported that SOC can be applied across the lifespan and noted that the need for selection increases with age due to biological factors. Increased selection with age is consistent with the hypothesis that older adults strategically choose activities that have proven to be meaningful and pleasant. Optimization occurs across the lifespan, although there has been relatively little research into compensation in children and adolescents. Baltes thought that SOC would be applicable across cultures, because the theory does not

direct how these concepts are manifested and pointed out that “SOC is definitely context- and person-conditioned” (p. 372).

Baltes and Rudolph (2012) linked behaviors consistent with the theory of Selection, Optimization, and Compensation (SOC) to successful outcomes in pre- and post-retirement individuals. The authors noted that limits of mental, physical, or environmental resources force choices about how resources will be allocated; SOC strategies become increasingly effective as these resources become more limited. Baltes and Rudolph reported that perception of retirement as voluntary or involuntary is shaped by choice, motivation, and level of perceived control over the decision to retire. Other factors related to perception of choice in retirement are care obligations, commitments, and other personal factors. Baltes and Rudolph defined successful retirement as including “(1) the ability to adapt to new and changing conditions that occur as a function of one’s withdrawal from work roles, (2) the ability to disengage from such work roles while minimizing the experience of both physical and psychological disturbances that may be experienced during the retirement process... and (3) the perception that one has successfully retired” (p. 94). Baltes & Rudolph suggested development of interventions that teach SOC strategies. Psychoeducation around SOC strategies could be a useful component of any treatment involving activity in older adults.

### **Self-determination theory**

Another prominent theory of aging, Self-Determination Theory (SDT), posits that three innate psychological needs, competence, relatedness, and autonomy, are necessary for optimal functioning and well-being (Ryan & Deci, 2000). SDT further examines how social environments and environmental factors influence self-motivation, social



functioning, and well-being through these three psychological needs. Ryan and Deci pointed out that motivation is contingent upon the intrinsic interest of activities, based on the individual novelty, challenge, and esthetic value of the activities. Need satisfaction is a highly individual process and is influenced by individual competencies and the demands of the context. Distress and psychopathology are theorized to result from environments that have excessive control, nonoptimal challenges, and lack of connectedness, which is seen to lead to lack of initiative and responsibility. Familiar activities provide established avenues for experiences of competence, social interactions or relatedness, and autonomy. It may be that the optimal levels or rank order of these three psychological needs varies depending on age.

### **Socioemotional selectivity theory**

Socioemotional selectivity theory (SST), an outgrowth of SOC, classifies goals as being focused on either an emotional result or on obtaining novel information or experiences (Carstensen, Fung, & Charles, 2003); in the former the emotional state is rewarding, while in the latter, a long term benefit is anticipated. Young adults are working toward a long future, while older adults view themselves as having less time available to obtain and benefit from the rewards associated with building knowledge or new experiences. Emotional goals are high in infancy and early childhood and then again in later life, as perspective shifts from the future to the present. Older adults prioritize known, positive social relationships over new or emotionally distant relationships, to avoid negative emotions proactively, to pay more attention to and have more memory for positive events as compared to negative ones, and to focus more on the present. Older adults are viewed as having less incentive to invest time or effort in future oriented goals,

instead focusing on established relationships with friends and family that provide positive interactions.

In older adults, the quantity of social interaction does not predict satisfaction, but the quality or level of social connectedness does (Carstensen, Fung, & Charles, 2003). Reduction in social network size in older adults, through a selective and intentional pruning process, leads to increased well-being, as interactions with close friends and family increase and interactions with acquaintances and negative interactions decrease. Established relationships are more likely to be associated with emotionally meaningful interactions, for both positive and negative exchanges, while novel social partners are more likely to provide new information or new experiences.

Research on social networks and emotions lends support to SST. In a longitudinal study of social networks and emotional experience across the adult lifespan, English and Carstensen (2014) found that social network size increased during young adulthood and then declined. The number of close relationships tended to be stable, while the number of peripheral partners declined over time. Older participants reported more positive and less negative emotion associated with their social networks. Individuals who reported more negativity with their social relationships also reported more negative experiences in daily life. While this study was longitudinal, it was only ten years in duration; it is not clear if findings were related to cohort differences or age differences.

A series of studies on age differences in social partner preferences found that older adults in the United States, Hong Kong, Taiwan, and mainland China all preferred to spend time with someone with close emotional ties (Fredrickson & Carstensen, 1990; Fung, Carstensen, & Lutz, 1999; Fung, Lai, & Ng, 2001). In these studies, participants

chose between three potential social partners: a close family member (emotional meaning), an author whose book you have read (knowledge), or an acquaintance that you have a lot in common with (expanding social opportunity). Results similar to those of older adults have been found in other individuals with limited time perspective, such as those with an impending move or terminal health condition (Fredrickson & Carstensen, 1990; Fung et al., 1999).

SST provides a model of intentional and emotionally beneficial pruning of social experiences that is conceptually imbedded within the larger framework of SOC. Older adults have been shown to selectively decrease the size of their social network, in order to focus time and attention on established meaningful and positive relationships, as well as to prefer existing relationships when given the choice. I hypothesized that selection of activities follows a similar pattern, in which older adults selectively prune the scope of their activities, to focus time and attention on established (or familiar) meaningful and positive experiences, and that they will prefer familiar activities when given the choice. This pattern of activity selection was hypothesized to include some overlap with the social impact on well-being described by SST, however this effect is hypothesized to exert influence on well-being above and beyond the social impact.

Taken together, the theory of SOC provides a framework for understanding how activity participation may change across the lifespan, SDT helps to explain the needs that are met through activity participation, and SST promotes the notion that younger adults expect a long future in which to experience the benefits of current experience, while older adults may be more focused on the present and on familiar activities that have been proved to be pleasant and worthwhile.

## Summary

My experiences providing psychotherapy to older adults in long term care settings highlight the need to target activities for behavioral activation that are likely to have the most utility. In this setting, individual limitations related to health, energy level, financial resources, or facility resources often mean that goals for behavioral activation are limited to one or two activities. As a clinician, it would be useful to have empirical evidence to guide selection of activities that have the best prospect of improving well-being. While it is known that activities with physical or social elements provide benefits, it is unclear what other aspects of activity might be beneficial or how these benefits may vary with age. Increased understanding of age-related differences in the response to activities that are novel or familiar will be useful in personalizing interventions that increase well-being across the lifespan.

I hypothesized that age moderates the relationship between activity familiarity and well-being (Figures 2 and 3). This relationship is supported by the literature on well-being, treatments utilizing personalized activities, leisure studies, flow, neurological and cognitive changes across the lifespan, personality traits, and theories of aging. Participation in personalized activities, those that are a match for individual values, interests, abilities, habits and roles, personality, and motivations, increase well-being in older and younger adults, both with and without mental health concerns such as depression. Novel experiences are more likely to provide knowledge and long-term benefits and require control processes, while familiar activities can be expected to be more meaningful, utilize a larger proportion of automatic processes, and may provide a

higher likelihood of experiencing flow states. Leisure studies reinforce the utility of both physical and sedentary activity participation as beneficial to well-being and highlights the need to examine demographic differences and physical health, relationship, vocational, and personality changes across the lifespan. Expected patterns of neurological and cognitive change help to explain why familiar activities may be preferred or provide the most benefit as age increases. Subjective age provides an alternative to chronological age that may enhance understanding of the subjective nature of the experience of aging. Finally, conceptualization of the relationship between activity familiarity and well-being is enhanced through understanding of three theories of aging: the theory of selection, optimization, and compensation, Self-Determination Theory, and socioemotional selectivity theory.

Familiarity of activity had not been studied empirically. The familiarity of an activity may be conceptualized to include factors such as frequency and duration of experience with the activity and face valid ratings of familiarity versus novelty of the activity. There was no existing measure of this construct; exploration of age-related differences in the relationship between activity novelty/familiarity and well-being required development and validation of a measure of novelty/familiarity of activity. The following expressions related to familiarity and novelty were examined: familiar, routine, habitual, well-known, novel, different, unfamiliar, and new. I also measured how often an activity was typically experienced and how long the individual has been participating in the activity. Further, the type of activity being measured was identified; Jopp and Hertzog (2010) provided a useful taxonomy of adult leisure activities, divided into eleven

categories (see Appendix B). Construction of a scale measuring the familiarity of activity required validation in order to effectively examine variations in familiarity.

### **Aims**

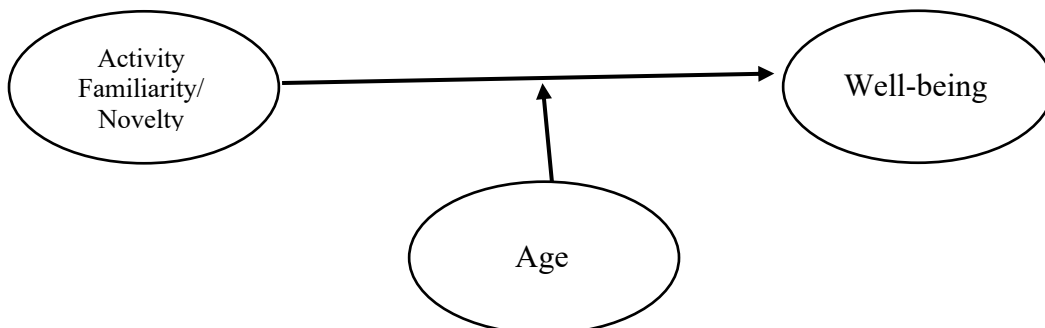
A cross-sectional study of the relationships among age, activity familiarity, and well-being was conducted. This study utilized a correlational design, in which participants completed an online survey designed to measure preferences for and benefit from activities.

I hypothesized that:

1. Older adults will express preference for familiar activities, while younger adults will be more likely to choose activities that are novel or provide opportunities to acquire knowledge, in a process paralleling the age-related changes in social network and in social preferences described in SST.
2. Age moderates the relationship between the familiarity of activity and eudaimonic well-being (Figure 2), such that for younger adults a low level of familiarity (or high novelty) best predicts well-being, while for older adults-a high level of familiarity best predicts well-being (Figure 3).

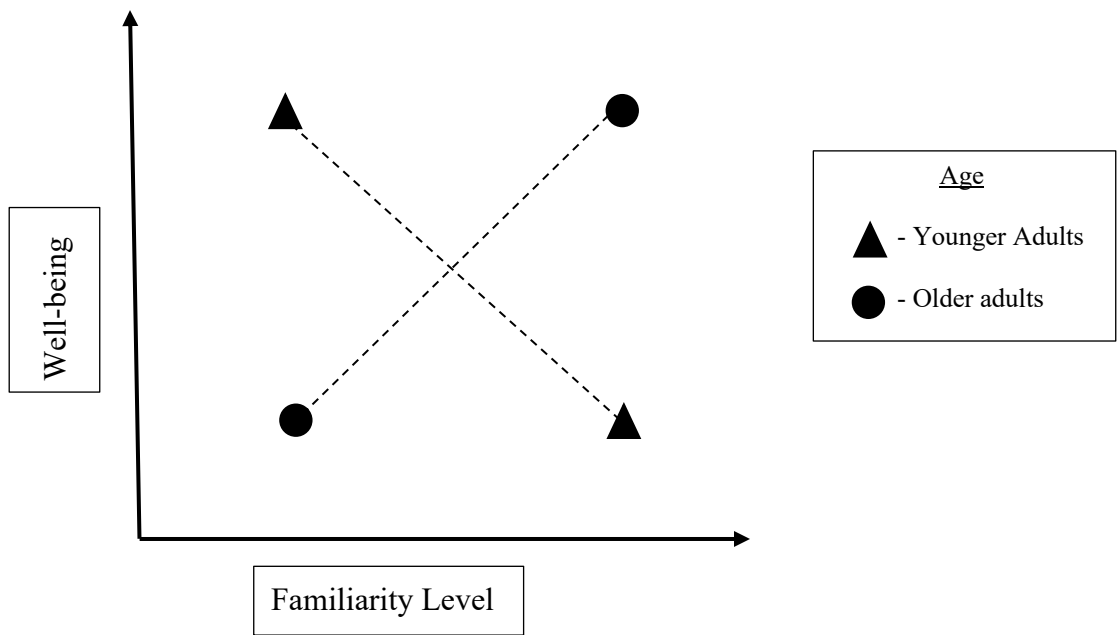
**Figure 2**

*Age Moderates the Relationship between Activity Familiarity/Novelty and Well-being*



**Figure 3**

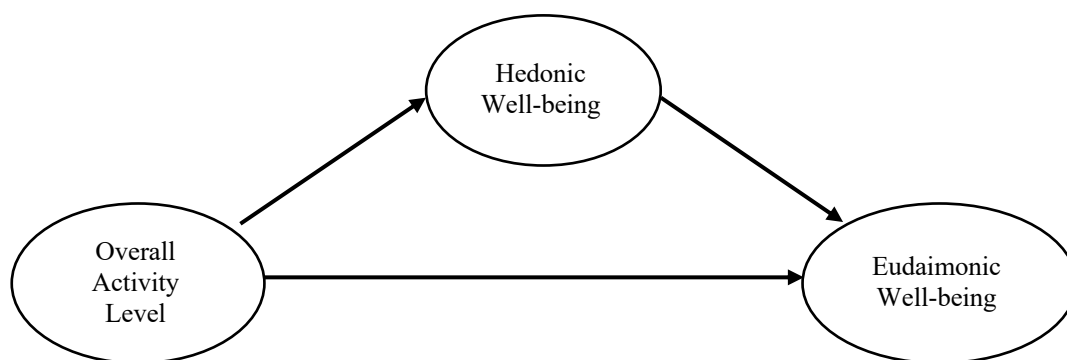
*Moderating Effect of Age on the Relationship between Familiarity of Activity and Well-being for Younger and Older Adults*



2a. The relationship between overall activity level and eudaimonic well-being is mediated by hedonic well-being in all age groups (Figure 4).

**Figure 4**

*Hedonic Well-being Mediates the Relationship Between Overall Activity Level and Eudaimonic Well-being*



2b. Activities rated high on the familiarity scale will be rated as more meaningful and automatic and related to increased flow states.

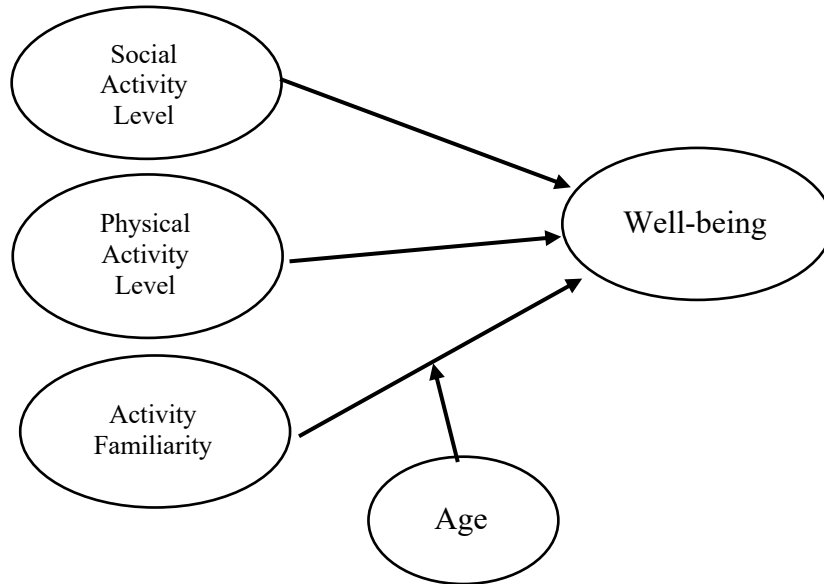
2c. Activities rated low on the familiarity scale (more novel) will be more likely to be viewed as potential sources of knowledge, providing long term benefits, and as involving controlled processes.

2d. The hypothesized age-related relationship between activity novelty/familiarity and well-being will persist when controlling for the effects of physical activity level, social aspects of the activities (as measured by number of others participating in the activity and a measure of social engagement; Figure 5) and overall activity level of the participant (Figure 6).



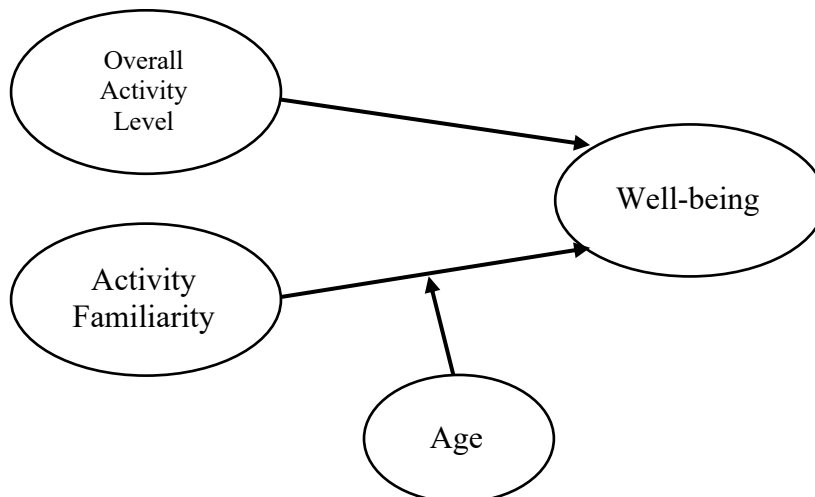
**Figure 5**

*The Relationship between Activity Familiarity and Well-being, Controlling for the Impact of Physical and Social Activity Level*



**Figure 6**

*The Relationship between Activity Familiarity and Well-being, Controlling for the Impact of Overall Activity Level*



3. Exploratory Hypothesis: The hypothesized age-related relationship between activity novelty/familiarity and well-being may be partially explained by factors relating to chronological age such as physical health, marital status, subjective age, vocational status, and the Big Five personality traits of extraversion and openness to experience.
4. Impact of the COVID-19 pandemic: As this study took place during the COVID-19 pandemic, disruptions to daily life, availability of activities, and changes in well-being were anticipated. The hypotheses above may be impacted by pandemic stressors, but the predicted relationships and patterns will persist when controlling for these stressors.

## CHAPTER 2

### METHODS AND MATERIALS

#### **Design**

This cross-sectional, correlational study of activity familiarity and well-being across the adult lifespan recruited subjects using Prolific, an online marketplace that manages online research participants. The survey was administered through REDCap (Research Electronic Data Capture), a secure, web-based software (Harris et al., 2009).

Internet-based research has rapidly increased in frequency and acceptability since the late 1990's (Mason & Suri, 2012; Gosling & Mason, 2015). Internet samples have been shown to be demographically diverse, and as equally well-adjusted and motivated as in person samples (Gosling et al., 2004). Benefits of online-survey delivery include decreased use of physical resources, elimination of data entry, and access to diverse populations (Gosling & Mason, 2015).

Web-based research may be limited by financial motivation issues, exclusive use of self-report data, and lack of follow-up data (Rice et al., 2017), although these concerns have been shown to be similar to in person psychological survey research (Gosling & Mason, 2015). An additional limitation may be selective participation; Heiervang & Goodman (2011) found lower rates of full response in web samples as compared to face-to-face interviews. The validity of online data can be compromised by the inability to

confirm self-reported demographic information; this study did not require specific demographic criteria for inclusion, making this less of a concern (Mason & Suri, 2012; Gosling & Mason, 2015). Validity may also be compromised by not being able to observe participants concentration during a task; online participants have been reported to be as attentive as those studied in person (Thomas & Clifford, 2017) and use of validity items or attention checks helps to improve data quality by identifying participants who may be answering randomly or otherwise are inattentive to the tasks at hand. Four questions designed to screen for attention were interspersed throughout the survey, participants who missed two or more attention checks were excluded from data analysis (see Appendix C; Berinsky et al., 2014; Oppenheimer et al., 2009; Thomas & Clifford, 2017).

## **Measures**

Demographic data collected included: chronological age (“What is your age?”), gender (“What gender do you identify as?”), ethnicity (“Please specify your ethnicity”), subjective age (“Many people feel a different age than they actually are. What age do you feel most of the time?”), education (“What is the highest degree or level of education you have completed?”), income (“What is your total household income per year?”), marital status (What is your marital status?”), vocational status (“What best describes your current vocational status?”), language (“Is English your first language?”), and geographic area (state, urban/suburban/rural) (see Appendix D for full demographic questions and response options).

### **Measure of Novelty/Familiarity**

Study of the novelty/familiarity of activities required development and validation of a measure of activity novelty/familiarity. Participants were asked to identify 3 leisure activities that they have participated in over the past month. They were then asked to rate their participation in and typical experience of each activity: type of activity, frequency, duration of experience with, number of others participating with or alongside, and experiences of flow. Frequency of activity ratings are taken from those used in the Victoria Longitudinal Study activity questionnaire (Jopp & Hertzog, 2010). They were also asked to rate each activity on a scale of 1 (not at all) to 7 (extremely) based on how familiar, novel, physical, social, meaningful, automatic, controlled, a source of knowledge, and a benefit to me in the future the activity is (see Appendix B for all items).

The Flow Experiences Scale (Waterman et al., 2003) was used to measure flow experiences for each identified activity (see Appendix B).

### **Familiar Activity Preference**

Preferences for familiar activities over novel activities were measured using a modified version of the research paradigm Carstensen, Fung, and Charles (2003) used to examine age differences in social partner preferences. Participants were prompted to consider spending time that is free of any other obligations or restrictions and to choose between three sets of potential activities chosen to represent activities that are familiar and emotionally meaningful or novel and that provide access to knowledge to examine activity preference; explicitly solitary activity choices were used in order to exclude the social aspects of activity preference posited by SST.

The first set of options were: (1) a visit by yourself to your favorite park, store, museum, or library or (2) a visit by yourself to a park, store, museum, or library that you

have never visited, but think that you might enjoy. The second set of options were: (1) read a book by your favorite author or watch a film by a director you enjoy or (2) read a book by an unknown author or watch a film by an unknown director that seems like something that you might enjoy. The third set of options were: (1) listen to music by a favorite musician or composer or (2) listen to unfamiliar music that has been recommended as something you may enjoy.

### **Measures of Well-Being**

Hedonic well-being is related to happiness or the presence of positive affect and the absence of negative affect. The dependent variable of hedonic well-being was measured using the Positive and Negative Affect Schedule (PANAS; Crawford & Henry, 2004), the Scale of Positive and Negative Experience (SPANE; Diener et al., 2010), the Satisfaction with Life Scale (SWLS; Pavot & Diener, 2009); the combined use of the SPANE and PANAS allowed for examination of both the frequency and intensity of emotion. A single measure of hedonic well-being was calculated by adding participant scores from the SPANE Affect Balance scale, the PANAS Positive Affect minus the PANAS Negative Affect scales, and the SWLS. This combined measure demonstrated good internal consistency,  $\alpha = .87$ .

Eudaimonic well-being is conceptualized as a long-term state of living well. The 42-item Psychological Well-being Scale (PWS; Ryff, 1989) was used to measure eudaimonic well-being. The PWS consists of 6 subscales: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth; a single measure of eudaimonic well-being was created using the sum of these 6

subscales. This combined measure demonstrated good internal consistency,  $\alpha = .87$ , consistent with previous examination of this scale (Shryock & Meeks, 2018).

### **Control Variables**

*Overall activity level* was measured using the 57-item, augmented Victoria Longitudinal Study Activity Lifestyle Questionnaire (VLS-ALQ); the augmented VLS-ALQ has demonstrated good reliability and validity as a measure of leisure activity across adult age groups (Jopp & Hertzog, 2010; Appendix B). Analysis of overall activity level was limited by missing data; due to a clerical error the physical activity subscale of the VLS-ALQ was not collected; the measure of overall activity level was therefore calculated with the 6 physical activity subscale items omitted.

*Physical health* was measured using the five items that make up the General Health subscale of the RAND 36-Item Short Form Health Survey (SF-36; Appendix D). The SF-36 General Health subscale has been found to reflect both physical and mental health concerns and to be a valid reflection of severity of health concerns (McHorney et al., 1993) and demonstrates adequate internal consistency (McHorney et al., 1994).

*Personality traits* were measured using the Ten-Item Personality Inventory (TIPI; Gosling et al., 2003; Appendix D). The TIPI was developed as a very brief measure of the Big-Five personality dimensions and demonstrates adequate reliability (test-retest reliability, mean  $r = .72$ ) and validity (convergent correlations with the Big-Five Inventory, mean  $r = .77$ ) (Gosling et al., 2003).

The current global pandemic, online data collection, and the correlational nature of the study were identified as potential limitations to this study. A recent review of COVID-19 and mental health (Rajkumar, 2020) suggested that anxiety, depression,

stress, and impaired sleep are common reactions to this pandemic. The current economic downturn, social distancing measures, and closures of businesses and schools are additional risk factors for both adverse mental health outcomes and limitations in participation in leisure activities (Brooks et al., 2020; Fitzpatrick et al., 2020; Panchal et al., 2020; Sanderson et al., 2020). Further, these factors may also lead to changes in activity preference. To control for the impact of these stressors, I used the COVID Stress Scales (CSS; Taylor et al., 2020). The CSS is a 36-item, self-report, Likert-type scale, that has been validated for use in English speaking adults; these scales were developed to assess stress or anxiety responses to COVID-19 using five subscales: danger and contamination fears, fears about economic consequences, xenophobia, compulsive checking and reassurance seeking, and traumatic stress symptoms about COVID-19 (see Appendix A; Ransing et al., 2020; Taylor et al., 2020). The CSS was developed and validated during the initial emergence of COVID-19, it is unclear how stress responses may vary across peak and post-peak periods of this pandemic, potentially limiting interpretation of these scales (Ransing et al., 2020).

## **Procedures**

Participant eligibility was limited to adults aged 18 and older who reside in the United States. Participants ( $N= 200$ ) were recruited across the adult lifespan, using Prolific custom prescreening to recruit an equal number of participants in the 18-54 and 55+ age ranges. Participants were compensated through the Prolific platform at a rate of \$4 for a fully completed survey. Compensation was funded in part by the University of Louisville Graduate Network Arts and Sciences and the Graduate Student Council. The



University of Louisville Institutional Review Board (IRB) reviewed and approved the study, IRB #20.1187.

Informed consent was obtained by presenting the consent form on the first page of the study website, in the form of a preamble in the online survey (full preamble in Appendix E). Information provided on the preamble provided enough information to justify the absence of a researcher during participation. Subjects were provided one of the researcher's phone numbers and had the ability to message the researchers through the Prolific platform for any questions they may have had regarding the consent form, or study overall; no subjects utilized these options. Subjects had an unlimited time to review the online consent form.

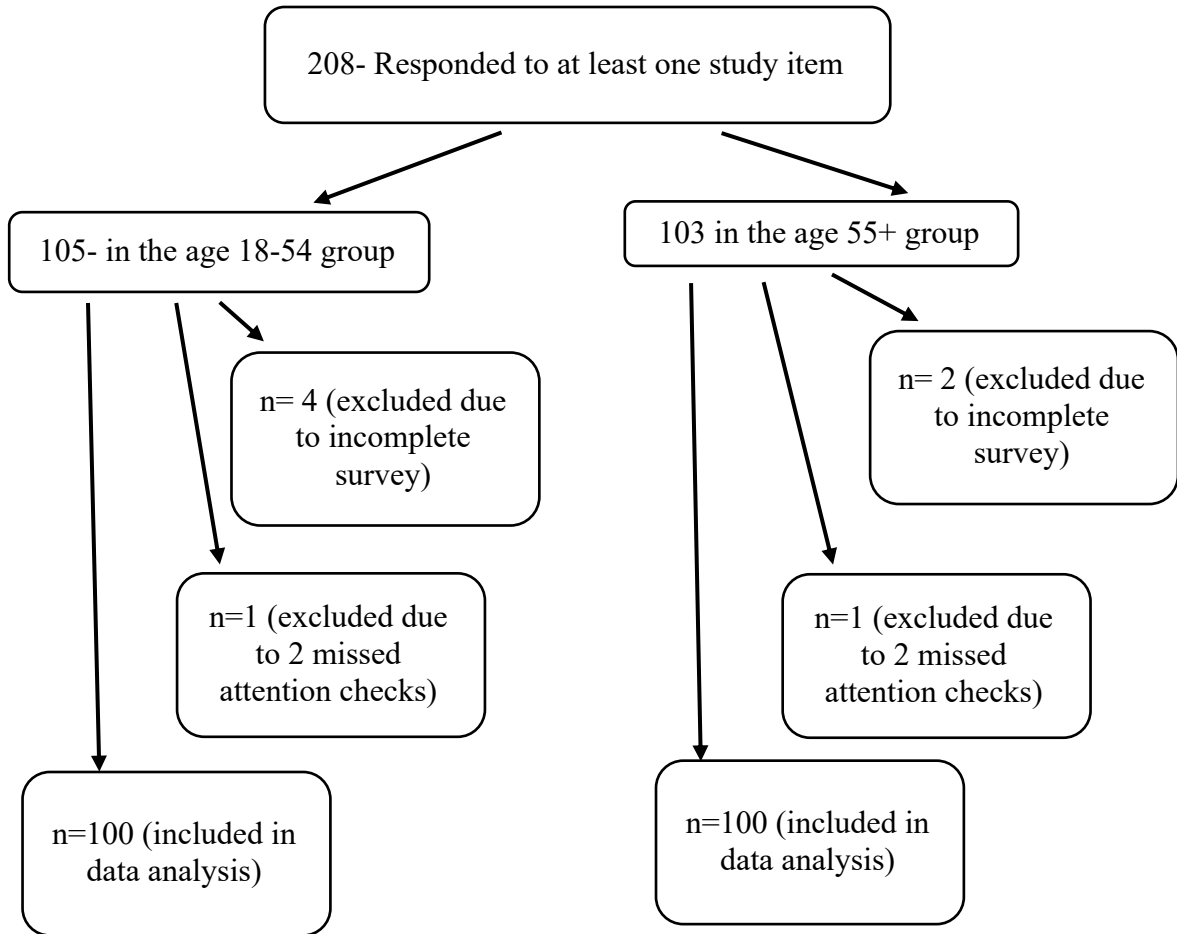
Data collection was paused after the first 20 participants in each age group to examine completion time and any qualitative feedback regarding study burden or item clarity. Completion time fell within the expected bounds and no qualitative feedback was received; data collection resumed with no changes to reimbursement of participants or study measures. All data collection took place during June 2021.

### **Participants**

Two hundred participants were included in analyses ( $n=100$  age 18-54 and  $n=100$  age 55 and over). Eight individuals completed at least one survey item but were excluded from analyses and did not receive compensation due to missed attention checks or failure to complete the survey (see Figure 7).

**Figure 7**

*Participant Recruitment Diagram*

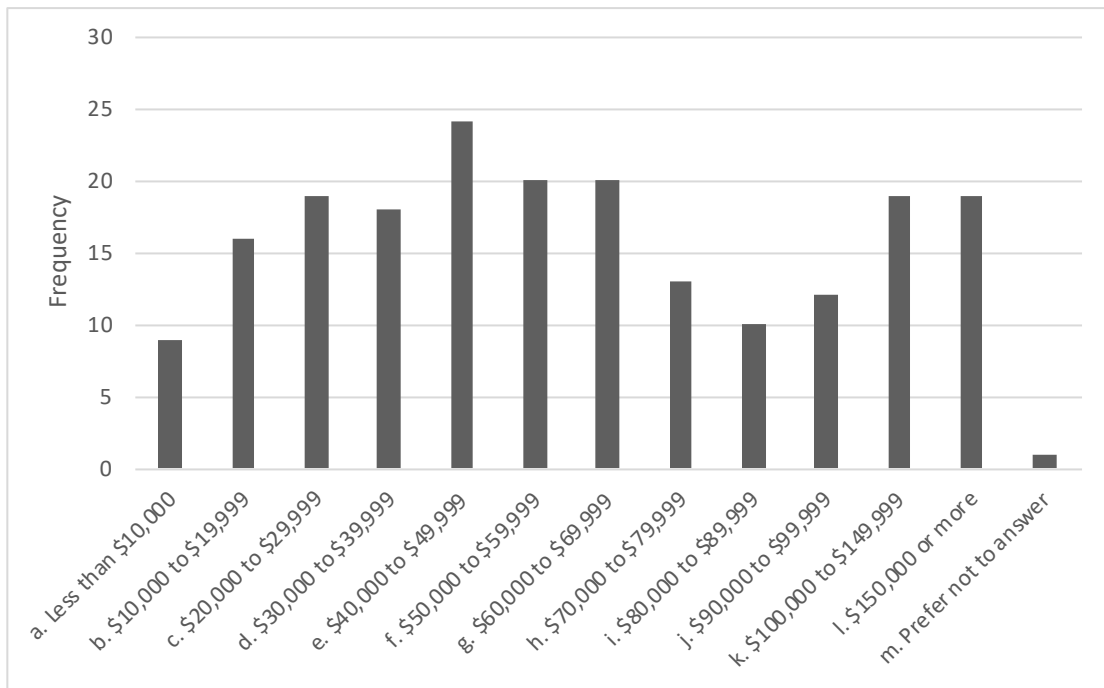


Participants ranged in age from 19 to 79, with a mean age of 47.57 (SD= 15.69) and were 52% female (0.5% other). In the 18-54 year old age group, participants had a mean age of 33.24 (SD= 6.62) and in the 55 and over age group participants had a mean age of 61.89 (SD= 6.03). See Table 1 for complete sociodemographic characteristics. In summary, a majority reported their ethnicity as White-European-American (82%), completion of a bachelor's degree or above (67%), were married or partnered (57%) and reported working full or part time (62.5%). Participants came from 36 states and a

majority described their home as a large city or suburbs of a large city (54%). A small number of participants reported that English was not their first language (3%). Internet-based samples are sometimes representative of population in terms of ethnicity, but often underrepresent lower and upper socioeconomic classes (Gosling & Mason, 2015; Buhrmester et al., 2018); this sample appears evenly distributed: 22% reported a total household income of \$29,999 or less, with 36.5% at \$70,000 or above (Figure 8).

**Figure 8**

*Total Household Income per Year*



**Table 1**

*Sociodemographic Characteristics of Participants*

Characteristic	Age 18-54 (n=100)		Age 55+ (n=100)		Full Sample (N=200)	
	n	%	n	%	n	%
Gender						
Female	39	39	65	65	104	52.00
Male	60	60	35	35	95	47.50
Other	1	1	-	-	1	.50
Ethnicity						

White/Caucasian	75	75	89	89	164	82.00
African American	11	11	2	2	13	6.50
Latino(a) or Hispanic	4	4	2	2	6	3.00
Asian	7	7	5	5	12	6.00
Native American, Hawaiian, or Pacific Islander	-	-	1	1.0	1	.50
Two or more	3	3	1	1	4	2.00
Education						
Some high school	2	2	-	-	2	1.00
High school	18	18	30	30	48	24.00
Trade school	12	12	13	13	25	12.50
Bachelor's degree	44	44	37	37	81	40.50
Master's degree	22	22	15	15	37	18.50
Doctorate degree	2	2	5	5	7	3.50
Marital Status						
Never married	38	38	16	16	54	27.00
Married/Partnered	55	55	59	59	114	57.00
Separated	2	2	-	-	2	1.00
Divorced	3	3	18	18	21	10.50
Widowed	-	-	7	7	7	3.50
Other	2	2	-	-	2	1.00
Vocational Status						
Employed full time	64	64	26	26	90	45.00
Employed part time	17	17	16	16	33	16.50
Student (full or part time)	2	2	-	-	2	1.00
Unemployed-seeking work	5	5	10	10	15	7.50
Unemployed-not seeking work	8	8	4	4	12	6.00
Retired	1	1	36	36	37	18.50
Disabled	2	2	7	7	9	4.50
Prefer not to answer	1	1	1	1	2	1.00
Home Location						
Large city	32	32	10	10	42	21.00
Suburbs of a large city	34	34	32	32	66	33.00
Small city	15	15	24	24	39	19.50
Town	15	15	16	16	31	15.50
Rural area	4	4	18	18	22	11.00
First Language						
English	98	98	96	96	194	97.00
Other	2	2	4	4	6	3.00

## Analysis

Data analysis took place using IBM SPSS Statistics version 28. An *alpha* level of .05 was used for all analyses.

## **Familiarity Scale Development**

Validation of the activity familiarity scale included examination of face validity, exploratory factor analysis (EFA) of the proposed items for inclusion in the final measure, and examination of internal consistency (Boateng et al., 2018).

## **Hypotheses**

Hypothesis 1 was that older adults will express preference for familiar activities, while younger adults will be more likely to choose activities that are novel or provide opportunities to acquire knowledge, in a process paralleling the age-related changes in social network and in social preferences described in SST. Three logistic regressions tested this hypothesis, one for each of three activity choices participants made (novel vs. familiar), with chronological age as the independent variable and the activity choice as the dependent variable.

Hypothesis 2 was that age moderates the relationship between the familiarity of activity and eudaimonic well-being (Figure 2), such that for younger adults a low level of familiarity (or novelty) best predicts well-being, while for older adults-a high level of familiarity best predicts well-being (Figure 3). Hypotheses 2 and 2a were examined using the PROCESS 4.1 macro for SPSS (Hayes, 2022; Field, 2018). Hypothesis 2 was a moderation analysis, with age as a moderator of the relationship between the independent variable of familiarity of activity (using a mean of the three familiarity ratings to examine overall familiarity) and the dependent variable of eudaimonic well-being. Hypothesis 2a was a mediation analysis, with hedonic well-being as a mediator of the relationship between the independent variable of overall activity level and the dependent variable of eudaimonic well-being. Hypotheses 2d and the exploratory hypothesis were to be

examined using structural equation modeling (SEM) of the proposed moderation and mediation models. Hypotheses 2b and 2c were examined using correlation; activity ratings were analyzed separately for each of the three activity choices. Separate analyses were conducted to account for potential variation due to fatigue or frustration with repeated administration of these previously untested items. The impact of the COVID-19 pandemic was examined by first exploring the correlation between the CSS subscales and the variables of interest from all hypotheses. Significant correlations were further explored by controlling for the relevant CSS subscales to determine if inclusion impacted model fit.

### **Power**

Due to a lack of existing empirical research on activity familiarity or novelty, it was difficult to estimate anticipated effect sizes for the planned analyses. A required sample size of 196 was calculated using a small effect size ( $d = .20$ ; Cohen, 1988), an alpha of .05, and power of .80 (Howell, 2013). The current sample size was sufficient to test hypotheses 1, 2, 2a, 2b, and 2c; the other hypotheses were determined to require a minimum sample size of 200. Power analysis of structural equation modeling is challenging (Wolf et al., 2013); it is not always clear *a priori* what sample size will be required. As hypothesis 2d and the exploratory hypothesis were not examined due to the results of the previous hypotheses, no structural equation modeling took place.

## CHAPTER 3

### RESULTS

#### **Pilot study**

Data collection was paused after the first 20 participants in each age group to examine completion time and qualitative feedback regarding study burden or item clarity. Mean survey completion time was 28.90 minutes (SD= 18.08) in the 18-54 age group and 29.05 (SD= 10.14) in the 55+ age group. No qualitative feedback was received from participants; the study was resumed with no changes in format or compensation. These initial participants were included in the final sample.

#### **Familiarity Scale Development**

The proposed novelty/familiarity items were first examined by a small group of faculty, graduate students, and volunteers for clarity and relevance; no concerns were raised and all 20 items were considered to have adequate face validity and included in the study.

Exploratory factor analysis of the 20 items proposed to be related to activity familiarity were included in an initial EFA for each of the three activities identified by participants. Ten items having non-significant correlations with a majority of other items ( $p > 0.05$ ) were removed from the scale, and the remaining ten items were examined in a second set of EFAs. These items included ratings of how familiar, routine, habitual, well-

known, novel (reverse coded), different (reverse coded), unfamiliar (reverse coded), and new each activity was, in addition to the frequency and duration of experience with each activity.

A principal axis factor analysis was conducted on the 10 items with oblique rotation (direct oblimin) for each of the 3 activities identified by participants. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analyses, KMO= 0.82, 0.84, and 0.86 ('great' according to Kaiser & Rice, 1974), and all KMO values for individual items were greater than 0.76, which is well above the acceptable limit of 0.5- (Kaiser & Rice, 1974). Bartlett's Test of Sphericity confirmed factor analysis is appropriate,  $p < .001$  for all 3 EFAs (Field, 2018). No items had correlation coefficients with other items  $> 0.90$ , and all items were significantly correlated with a majority of the other items.

This ten-item familiarity scale had good internal consistency across each of the three activity ratings,  $\alpha = 0.83, 0.86, \text{ and } 0.87$ . Cronbach's Alpha if item deleted increased for activity frequency across all three activity ratings, so this item was removed from the scale. This nine-item familiarity scale had good internal consistency across each of the three activity ratings,  $\alpha = 0.84, 0.87, \text{ and } 0.88$ . Cronbach's Alpha if item deleted increased for ratings of how novel the activity was for two of the three activity ratings, so this item was removed from the scale. The resulting 8 item scale had good internal consistency across each of the three activity ratings,  $\alpha = 0.85, 0.87, \text{ and } 0.89$ . Cronbach's Alpha if item deleted increased for ratings of duration of activity experience for the second of the three activity ratings only (to 0.87), so this item was retained.

A principal axis factor analysis was conducted on the 8 items with oblique rotation (direct oblimin) for each of the 3 activities identified by participants. The Kaiser-



Meyer-Olkin measure verified the sampling adequacy for the analyses, KMO= 0.82, 0.82, and 0.82 ('great' according to Kaiser & Rice, 1974), and all KMO values for individual items were greater than 0.72, which is well above the acceptable limit of 0.50 (Kaiser & Rice, 1974). Bartlett's Test of Sphericity confirmed factor analysis is appropriate,  $p < .001$  for all 3 EFAs (Field, 2018). No items had correlation coefficients with other items  $> 0.90$ , and all items were significantly correlated with all the other items, therefore all eight items were retained to form the final familiarity scale. The final 8-item scale included: ratings of how familiar, routine, habitual, well-known, different (reverse coded), unfamiliar (reverse coded), and new each activity was, in addition to the duration of experience with each activity.

Scores on the final familiarity scale ranged from 14-46 across the 3 rated activities. An overall familiarity rating was calculated using the mean of the 3 ratings for each participant ( $M = 19.67$ ,  $SD = 5.02$ ).

As no scale of activity familiarity was available for comparison, validity was examined by correlating familiarity of each of the 3 rated activities with ratings of the single item of activity familiarity. The 8-item familiarity scale correlated strongly with ratings of the single item of activity familiarity,  $r(198) = .74$ ,  $p < .001$ ;  $r(197) = .82$ ,  $p < .001$ ;  $r(196) = .80$ ,  $p < .001$ .

### **Hypothesis 1**

Hypothesis 1, which predicted a relationship between activity choice (novel or familiar) and chronological age, was not supported. Three logistical regressions were conducted; chronological age was not a significant predictor of activity choice for any of the 3 activity choices. The results of these analyses are shown in Table 2.

The activity choice options were as follows: (1) a visit by yourself to your favorite park, store, museum, or library or (2) a visit by yourself to a park, store, museum, or library that you have never visited, but think that you might enjoy, (1) read a book by your favorite author or watch a film by a director you enjoy or (2) read a book by an unknown author or watch a film by an unknown director that seems like something that you might enjoy, and (1) listen to music by a favorite musician or composer or (2) listen to unfamiliar music that has been recommended as something you may enjoy.

### Exploratory Analyses Related to Hypothesis 1

Table 2 also shows the results of testing Hypothesis 1 using subjective age instead of chronological age. With subjective age instead of chronological age as the independent variable the model became significant for activity choice 1,  $\chi^2(1) = 4.25, p = .04$ . Subjective age was not a significant predictor of activity choice for the second or third activity choices.

**Table 2**

*Age as a Predictor of Activity Choices*

	$\chi^2$	<i>df</i>	<i>p</i>
Choice 1			
Chronological Age	.06	1	.82
Subjective Age	4.25	1	.04*
Choice 2			
Chronological Age	.01	1	.91
Subjective Age	.16	1	.69
Choice 3			
Chronological Age	1.09	1	.30
Subjective Age	2.14	1	.14

\* $p < .05$

The addition of gender or marital status to the first activity choice model did not significantly improve model fit,  $\chi^2(1) = 3.60, p = .06$  and  $\chi^2(1) = 1.01, p = .32$ ,

respectively. Bootstrapping was performed, which indicated a genuine relationship between subjective age and activity choice, BCa 95% confidence interval= -.04 to -.00 (Table 3). This model accounted for between 2.10 and 2.80 % of the variance in activity choice. One year of increased subjective age is associated with a decrease in the odds of choosing the novel activity by a factor of .98.

**Table 3**

*Coefficients of the Model Predicting Activity Choice 1 (95% BCa bootstrap confidence intervals based on 1000 samples in brackets)*

	<i>b</i> (standardized)	95% CI for Odds Ratio		
		Odds Ratio	Lower	Upper
Included				
Constant	1.11 [.37- 1.92]			
Subjective Age	-.02* [-0.4, -.00]	.98	.96	1.00

*Note.*  $R^2 = .03$  (Hosmer-Lemeshow),  $.02$  (Cox-Snell),  $.03$  (Nagelkerke). Model  $\chi^2(1) = 4.25$ ,  $p = .04$ . BCa = bias-corrected and accelerated

\* $p < .05$

An additional way to look at age-related preferences was to examine age in relation to overall ratings of activity familiarity. Mean familiarity ratings across three identified activities were significantly and positively correlated with both chronological and subjective age (see Table 4); older participants chose activities that they rated as more familiar.

**Table 4**

*Mean Activity Familiarity and Age Pearson Correlations*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3
----------	----------	----------	-----------	---	---	---

1. Mean Familiarity	200	37.34	5.02	-		
2. Chronological Age	200	47.57	15.69	.17*	-	
3. Subjective Age	200	38.90	14.72	.17*	.68**	-

\* $p < .05$ . \*\* $p < .01$ .

Finally, frequency of responses to the three activity choices in relation to differences in how the questions were worded was examined: 58% chose the novel park, store, museum, or library that *you think you might enjoy*, 45.50% chose a novel, book, or film that *seems like something that you might enjoy*, and 26.50% chose novel music that has been *recommended as something you might enjoy*.

## Hypothesis 2

Hypothesis 2 predicted age to moderate the relationship between activity familiarity and eudaimonic well-being (Figure 2), where for younger adults a low level of familiarity (novelty) best predicts well-being, while for older adults a high level of familiarity best predicts well-being (Figure 2). This hypothesis was tested with multiple regression using the PROCESS macro in SPSS 28 (Hayes, 2022). The relationship between familiarity and well-being was non-significant and was not found to be moderated by age (see Table 5).

**Table 5**

*Test of Hypothesis 2: Multiple Linear Regression of Eudaimonic Well-being onto Age, Familiarity, and Interaction of Age and Familiarity*

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
	[CI]			

Constant	212.84 [207.63, 218.06]	2.65	80.48	<.001
Age (centered)	.30 [-.03, .63]	.170	1.77	.08
Familiarity (centered)	.20 [-.84, 1.24]	.53	.38	.71
Age x Familiarity	-.03 [-.09, .04]	.03	-.83	.41

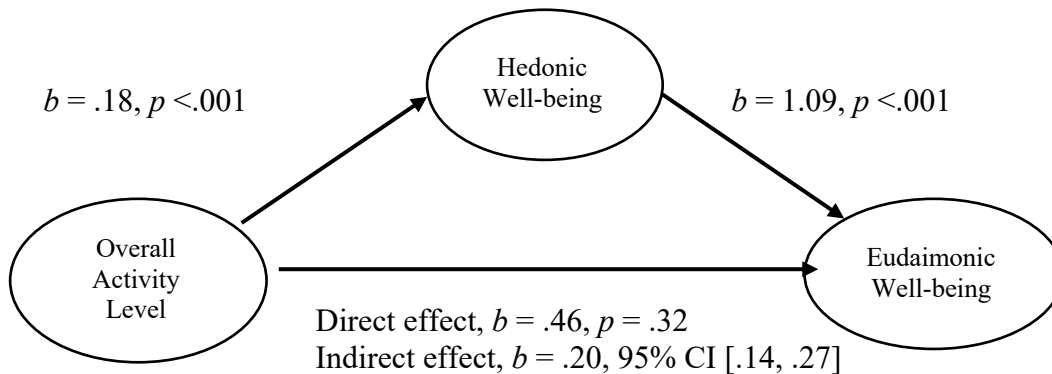
Note. Full model  $R^2 = 0.02$ ;  $B =$  Unstandardized regression coefficient.

### Hypothesis 2a

Hypothesis 2a predicted that the relationship between overall activity level and eudaimonic well-being is mediated by hedonic well-being in all age groups (Figure 3). This hypothesis was tested with multiple regression using the PROCESS macro in SPSS 28 (Hayes, 2022). There was no significant mediation effect of overall activity level on eudaimonic well-being through hedonic well-being. The indirect effect of overall activity level on eudaimonic well-being through hedonic well-being,  $b = .20$ , 95% CI [.14, .27], was non-significant; there were significant direct effects of overall activity level on hedonic well-being and of hedonic well-being on eudaimonic well-being (see Figure 9).

### Figure 9

Model of Overall Activity as a Predictor of Eudaimonic Well-being, Mediated by Hedonic Well-being



*Note.* The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples. *b*=Standardized regression coefficient.

### **Hypothesis 2b**

Activities rated high on the familiarity scale were hypothesized to be rated as more meaningful, automatic, and to be related to increased flow states. Hypothesis 2b was examined using correlation for each of the three activities identified by participants. There was not a significant relationship between ratings of familiarity and meaningfulness or flow; familiarity was significantly related to automaticity (see Tables 6, 7, & 8).

**Table 6**

*First Activity Descriptive Statistics and Pearson Correlations for H<sub>2b</sub>*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4
1. Familiarity	200	36.92	6.83	-			
2. Meaningful	200	4.03	1.03	-.06	-		
3. Automatic	200	2.25	1.25	.35**	.01	-	
4. Flow	200	35.42	5.98	.06	.37**	.10	-

\**p* < .05. \*\**p* < .01.

**Table 7**

*Second Activity Descriptive Statistics and Pearson Correlations for H<sub>2b</sub>*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4
1. Familiarity	199	37.43	7.13	-			

2. Meaningful	199	3.85	1.13	.07	-		
3. Automatic	199	2.58	1.35	.49**	.12	-	
4. Flow	199	40.47	7.02	.09	.25**	.24**	-

\* $p < .05$ . \*\* $p < .01$ .

**Table 8**

*Third Activity Descriptive Statistics and Pearson Correlations for H<sub>2b</sub>*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4
1. Familiarity	198	37.63	7.75	-			
2. Meaningful	198	3.90	1.15	-.05	-		
3. Automatic	198	2.65	1.37	.41**	.02	-	
4. Flow	198	39.63	8.31	.00	.41**	.07	-

\* $p < .05$ . \*\* $p < .01$ .

### **Exploratory Analyses Related to Hypothesis 2b**

Additionally, correlations between ratings of familiarity for the three activity choices and ratings of meaningfulness, automaticity, and flow were examined by age group (age 18-54 & 55+). See Tables 9, 10, & 11. Consistent with the whole sample, there was not a significant relationship between ratings of familiarity and meaningfulness or flow; familiarity was significantly related to automaticity for all three activity choices.

**Table 9**

*First Activity Descriptive Statistics and Pearson Correlations for H<sub>2b</sub> by Age Group*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4
1. Familiarity							
Age 18-54	100	36.54	6.93	-			
Age 55+	100	37.30	6.74	-			
2. Meaningful							
Age 18-54	100	4.02	.99	-.05	-		
Age 55+	100	4.05	.108	-.08	-		
3. Automatic							
Age 18-54	99	2.41	1.23	.26**	.03	-	
Age 55+	100	2.08	1.25	.47**	-.01	-	
4. Flow							
Age 18-54	100	35.63	6.14	.12	.26*	.15	-
Age 55+	100	35.21	5.83	<.01	.49**	.04	-

\**p* < .05. \*\**p* < .01.

**Table 10**

*Second Activity Descriptive Statistics and Pearson Correlations for H<sub>2b</sub> by Age Group*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4
1. Familiarity							
Age 18-54	100	36.45	7.10	-			
Age 55+	100	38.39	7.07	-			
2. Meaningful							
Age 18-54	100	3.80	1.16	.02	-		
Age 55+	100	3.91	1.11	.11	-		
3. Automatic							
Age 18-54	99	2.57	1.27	.43**	.16	-	
Age 55+	100	2.59	1.43	.56**	.08	-	
4. Flow							
Age 18-54	99	40.66	7.26	.09	.21*	.26**	-
Age 55+	100	40.29	6.81	.09	.22*	.22*	-

\**p* < .05. \*\**p* < .01.

**Table 11**

*Third Activity Descriptive Statistics and Pearson Correlations for H<sub>2b</sub> by Age Group*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4
1. Familiarity							
Age 18-54	99	36.44	8.30	-			
Age 55+	99	38.82	7.00	-			
2. Meaningful							
Age 18-54	99	3.90	1.17	-.01	-		
Age 55+	99	3.91	1.14	-.01	-		
3. Automatic							



Age 18-54	100	2.71	1.31	.38**	-.01	-	
Age 55+	100	2.59	1.43	.49**	.06	-	
4. Flow							
Age 18-54	99	39.78	8.44	-.11	.52**	-.07	-
Age 55+	100	39.47	8.22	.14	.29**	.20*	-

\* $p < .05$ . \*\* $p < .01$ .

### Hypothesis 2c

Activities rated low on the familiarity scale (more novel) were hypothesized to be rated as potential sources of knowledge, a source for long-term benefits, and involving controlled processes. Hypothesis 2c was examined using correlation. Little support was found for Hypothesis 2c; most predicted relationships were not significant. Ratings of the level of effort for activity choice 3 were negatively associated with familiarity and neared significance in activity 2 (see Table 12).

**Table 12**

*First Activity Descriptive Statistics and Pearson Correlations for H<sub>2c</sub>*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Familiarity	200	36.92	6.83	-				
2. Source of knowledge	200	3.30	1.38	-.09	-			
3. Source for long-term benefits	200	3.83	1.18	-.13	.38**	-		
4. Demanding	200	2.48	1.33	-.10	.13	.36**	-	
5. Effortful	200	3.07	1.29	-.06	.13	.32**	.62**	-

\* $p < .05$ . \*\* $p < .01$ .

**Table 13***Second Activity Descriptive Statistics and Pearson Correlations for H<sub>2c</sub>*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Familiarity	199	37.43	7.13	-				
2. Source of knowledge	199	3.29	1.35	-.03	-			
3. Source for long-term benefits	199	3.77	1.30	.01	.32**	-		
4. Demanding	199	2.63	1.40	-.05	.03	.31**	-	
5. Effortful	199	3.13	1.42	-.14	.02	.38**	.69**	-

\**p* < .05. \*\**p* < .01.**Table 14***Third Activity Descriptive Statistics and Pearson Correlations for H<sub>2c</sub>*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Familiarity	198	37.63	7.75	-				
2. Source of knowledge	198	3.28	1.44	-.12	-			

3. Source for long-term benefits	198	3.75	1.30	-.13	.54**	-		
4. Demanding	198	2.42	1.41	-.10	.19**	.48**	-	
5. Effortful	198	2.83	1.46	-.15*	.27**	.51**	.77**	-

\* $p < .05$ . \*\* $p < .01$ .

### Exploratory Analyses Related to Hypothesis 2c

Additionally, correlations between ratings of familiarity for the three activity choices and activity ratings for how much of a source of knowledge, a source for long-term benefits, how demanding, and how effortful were examined by age group (age 18-54 & 55+). Most predicted relationships were not significant in both groups. Ratings of the activity as a source of future benefit were negatively associated with familiarity for activity 1 in the 18-54 age group and activity 3 in the 55+ age group; see Tables 15, 16, & 17.

**Table 15**

*First Activity Descriptive Statistics and Pearson Correlations for H<sub>2c</sub> by Age Group*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Familiarity								
Age 18-54	100	36.54	6.93	-				
Age 55+	100	37.30	6.74	-				
2. Source of knowledge								
Age 18-54	100	3.31	1.35	-.14	-			
Age 55+	100	3.29	1.41	-.04	-			
3. Source for long-term benefits								
Age 18-54	100	3.85	1.07	-.23*	.30**	-		

Age 55+	100	3.81	1.29	-.05	.44**	-		
4. Demanding								
Age 18-54	100	2.62	1.27	-.17	.23*	.44**	-	
Age 55+	100	2.33	1.39	-.03	.05	.30**	-	
5. Effortful								
Age 18-54	100	3.19	1.25	-.13	.20*	.31**	.62**	-
Age 55+	100	2.96	1.32	.01	.07	.32**	.62**	-

\* $p < .05$ . \*\* $p < .01$ .

**Table 16**

*Second Activity Descriptive Statistics and Pearson Correlations for H<sub>2c</sub> by Age Group*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Familiarity								
Age 18-54	100	36.45	7.10	-				
Age 55+	100	38.39	7.07	-				
2. Source of knowledge								
Age 18-54	99	3.29	1.39	-.07	-			
Age 55+	100	3.28	1.31	.01	-			
3. Source for long-term benefits								
Age 18-54	99	3.74	1.33	-.03	.27**	-		
Age 55+	100	3.80	1.27	.05	.36**	-		
4. Demanding								
Age 18-54	99	2.87	1.43	-.03	.12	.32**	-	
Age 55+	100	2.40	1.35	-.03	-.08	.33**	-	
5. Effortful								
Age 18-54	99	3.31	1.40	-.09	.06	.42**	.67**	-
Age 55+	100	2.94	1.43	-.15	-.03	.35**	.70**	-

\* $p < .05$ . \*\* $p < .01$ .

**Table 17**

*Third Activity Descriptive Statistics and Pearson Correlations for H<sub>2c</sub> by Age Group*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Familiarity								
Age 18-54	99	36.44	8.30	-				
Age 55+	99	38.82	7.00	-				
2. Source of knowledge								

Age 18-54	99	3.33	1.38	-.09	-			
Age 55+	99	3.23	1.50	-.16	-			
3. Source for long-term benefits								
Age 18-54	99	3.82	1.23	.04	.47**	-		
Age 55+	99	3.68	1.37	-.29**	.59**	-		
4. Demanding								
Age 18-54	99	2.78	1.44	-.02	.22*	.52**	-	
Age 55+	99	2.07	1.30	-.13	.16	.45**	-	
5. Effortful								
Age 18-54	99	3.10	1.45	-.09	.26*	.51**	.80**	-
Age 55+	99	2.56	1.42	-.17	.28*	.51**	.72**	-

\* $p < .05$ . \*\* $p < .01$ .

### Hypothesis 2d

The age-moderated relationship between activity novelty/familiarity and well-being (Hypothesis 2) was hypothesized to persist when controlling for the effects of physical activity level, social aspects of the activities (as measured by number of others participating in the activity and a measure of social engagement; Figure 5) and overall activity level of the participant (Figure 6).

As the null hypothesis for Hypothesis 2 could not be rejected, no analysis of Hypothesis 2d was indicated.

### Exploratory Analysis Related to Hypothesis 2d

The mean familiarity rating across the three self-selected activities was not found to be significantly correlated with the measures of hedonic well-being (SWLS:  $r(198) = -.05$ ,  $p = .45$ , SPANE Affect Balance:  $r(198) = -.06$ ,  $p = .43$ , or PANAS Positive Affect – Negative Affect:  $r(192) = .11$ ,  $p = .12$ , or eudaimonic well-being (PWS:  $r(198) = .05$ ,  $p = .43$ ).

## **Exploratory Hypothesis**

The age-moderated relationship between activity novelty/familiarity and well-being was hypothesized to be partially explained by factors relating to chronological age such as physical health, marital status, subjective age, vocational status, and the Big Five personality traits of extraversion and openness to experience.

As the null hypothesis for Hypothesis 2 could not be rejected, no analysis of the exploratory hypothesis was indicated. However, the correlations among these variables is provided in Appendix F; notably, mean familiarity ratings were significantly negatively correlated with extraversion ( $r(198) = -.16, p = .02$ ). A two-way between-subjects ANOVA was conducted on mean familiarity ratings with marital and vocational status. Mean familiarity ratings were affected by neither the marital ( $F(5,176) = .48, p = .79$ , partial  $\eta^2 = .01$ ) nor vocational ( $F(7,176) = .75, p = .63$ , partial  $\eta^2 = .03$ ) status of participants. There was no significant interaction between these two factors ( $F(11,176) = .90, p = .54$ , partial  $\eta^2 = .05$ ).

## **COVID Stress Scales**

Table 18 shows the correlations between the COVID Stress Scales (CSS) and the main variables of interest (age, subjective age, mean familiarity ratings, eudaimonic well-being, hedonic well-being, and total well-being). The CSS subscale Danger was significantly negatively correlated with the mean familiarity ratings and the three well-being variables – that is, people who reported more worry about catching or being able to access treatment for COVID-19 selected less familiar activities and had reported lower well-being than those who reported less COVID-19 worry. The CSS subscale Checking was significantly negatively correlated with age and subjective age, and significantly

positively correlated with hedonic well-being. That is, people who sought information and reassurance from sources, and checked for signs of infection, were younger and reported higher hedonic well-being than those who did not endorse these checking items.

**Table 18**

*CSS Pearson Correlations with Study Variables*

Variable	Danger	Social/Economic Consequences	Xenophobia	Contamination	Traumatic Stress	Checking
Age	-.04	-.10	-.09	-.16*	-.12	-.22**
Subjective age	-.00	-.14	-.05	-.07	-.09	-.21**
Mean familiarity ratings	-.19**	-.07	-.11	-.11	-.06	-.11
Eudaimonic Well-being	-.14*	-.09	.05	-.03	-.08	.06
Hedonic Well-being	-.22**	-.08	.09	-.04	-.08	.16*
Total Well- being	-.17*	-.08	.09	-.01	-.08	.13

\* $p < .05$ . \*\* $p < .01$ .

### **CSS and Hypothesis 1**

Based on the above correlations, the CSS Contamination and Checking subscales were added to the logistical regressions from Hypothesis 1, to examine if controlling for these variables changed the observed relationship between age/subjective age and activity choice. Consistent with the Hypothesis 1 analyses without the CSS scales included,

subjective age was a significant predictor for activity choice 1 and the inclusion of the CSS Contamination and Checking subscales did not improve model fit substantially (Tables 19 & 20).

**Table 19**

*Hypothesis 1 Revisited: Controlling for COVID Stress Scales Contamination and Checking with Chronological Age*

	$\chi^2$	<i>df</i>	<i>p</i>
Choice 1			
CSS Checking	.11	1	.74
Chronological Age	.10	1	.75
Checking x Age	.67	1	.41
CSS Contamination	2.80	1	.09
Chronological Age	.258	1	.61
Contamination x Age	1.91	1	.17
Choice 2			
CSS Checking	3.88	1	.05*
Chronological Age	.11	1	.74
Checking x Age	1.44	1	.23
CSS Contamination	<.01	1	.98
Chronological Age	.01	1	.91
Contamination x Age	1.02	1	.31
Choice 3			
CSS Checking	.18	1	.67
Chronological Age	1.36	1	.24
Contamination x Age	.01	1	.93
CSS Contamination	.81	1	.37
Chronological Age	1.43	1	.23
Contamination x Age	.387	1	.53



**Table 20**

*Hypothesis 1 Revisited: Controlling for COVID Stress Scales Contamination and Checking with Subjective Age*

	$\chi^2$	<i>df</i>	<i>p</i>
Choice 1			
CSS Checking	.11	1	.74
Subjective Age	4.77	1	.03*
Checking x Subjective Age	.11	1	.75
CSS Contamination	2.80	1	.09
Subjective Age	4.89	1	.03*
Contamination x Subjective Age	.739	1	.39
Choice 2			
CSS Checking	3.88	1	.05*
Subjective Age	.67	1	.41
Checking x Subjective Age	.67	1	.41
CSS Contamination	.00	1	.98
Subjective Age	.16	1	.69
Contamination x Subjective Age	1.51	1	.22
Choice 3			
CSS Checking	.18	1	.67
Subjective Age	2.50	1	.11
Contamination x Subjective Age	.00	1	.97
CSS Contamination	.81	1	.37
Chronological Subjective Age	2.35	1	.13
Contamination x Subjective Age	.29	1	.59

### **CSS and Hypothesis 2**

The CSS Danger, Contamination, and Checking subscales were added to the moderation analyses from Hypothesis 2, to examine if controlling for these variables changed the observed age-moderated relationship between familiarity and eudaimonic

well-being. Consistent with the Hypothesis 2 analyses without the CSS scales included, the relationship between familiarity and well-being was non-significant and was not found to be moderated by age (see Table 21) and the inclusion of the CSS Danger, Contamination, and Checking subscales did not improve model fit substantially.

**Table 21**

*Hypothesis 2 Revisited: Multiple Linear Regression of Eudaimonic Well-being onto Age, Familiarity, and Interaction of Age and Familiarity, Controlling for COVID Stress Scales Danger, Contamination, and Checking*

	<i>B</i> [ <i>CI</i> ]	<i>SE B</i>	<i>t</i>	<i>p</i>
Constant	214.94 [207.19, 222.68]	3.926	54.74	<.001
Age (centered)	.42 [.09, .03]	.171	2.48	.01
Familiarity (centered)	-.08 [-1.12, .96]	.530	-.15	.88
Age x Familiarity	-.03 [-.10, .03]	.033	-1.01	.31
CSS Danger	-1.95 [-3.24, -.67]	.652	-3.00	.00
CSS Checking	1.11 [-.09, 2.32]	.611	1.82	.07
CSS Contamination	.90 [-.49, 2.30]	.706	1.28	.20

*Note. Full model  $R^2 = 0.08$ ;  $B$  = Unstandardized regression coefficient.*

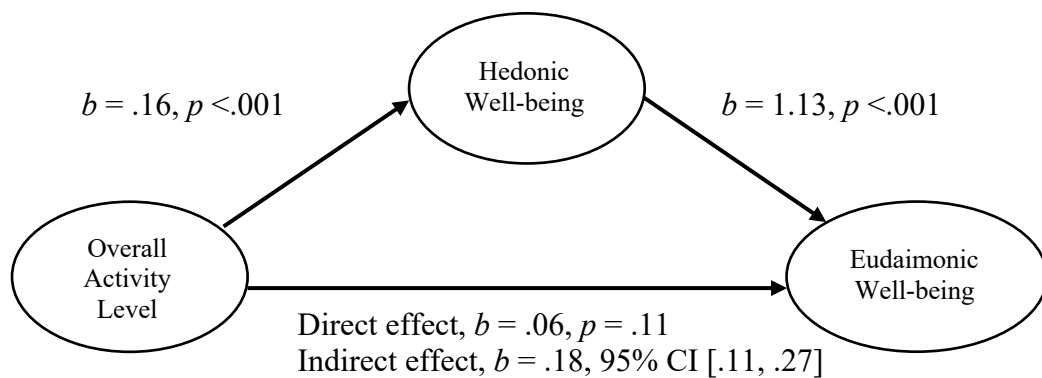
### **CSS and Hypothesis 2a**

Hypothesis 2a predicted that the relationship between overall activity level and eudaimonic well-being is mediated by hedonic well-being in all age groups (Figure 3).

The CSS Danger, Contamination, and Checking subscales were added to the mediation analyses from Hypothesis 2a, to examine if controlling for these variables changed the observed mediation model. Consistent with the Hypothesis 2a analyses without the CSS scales included, the indirect effect of overall activity level on eudaimonic well-being through hedonic well-being,  $b = .18$ , 95% CI [.11, .27], was non-significant; there were significant direct effects of overall activity level on hedonic well-being and of hedonic well-being on eudaimonic well-being (see Figure 10). The inclusion of the CSS Danger, Contamination, and Checking subscales did not improve model fit substantially.

**Figure 10**

*Hypothesis 2a Revisited: Model of Overall Activity as a Predictor of Eudaimonic Well-being, Mediated by Hedonic Well-being and Controlling for COVID Stress Scales Danger, Contamination, and Checking*



*Note.* The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples.  $b$ =Standardized regression coefficient.

## CHAPTER 4

### DISCUSSION

#### **Summary & Conclusions**

This study grew out of a desire to better understand age-related differences in the interaction of familiarity of activity and well-being. My hypotheses grew out of findings from a study of theatre patrons (Meeks et al., 2017) and a review of the literature on well-being, treatments utilizing personalized activities, leisure studies, flow, neurological and cognitive changes across the lifespan, personality traits, and theories of aging. Broadly, I hypothesized that selection of activities and benefit from activities varies by age, where older adults are more likely to select and receive increased benefit from more familiar activities.

#### **Familiarity Scale Development**

There was no existing measure of activity familiarity, so construction and validation of a scale was a necessary preliminary step to exploring this construct. The resulting scale contained 8 items with adequate face validity, good internal consistency, appropriate inter-correlations, and validity.

#### **Hypothesis 1**

No support was found for Hypothesis 1, which predicted a relationship between activity choice and chronological age. In an additional analysis, subjective age was a

significant predictor for activity choice 1, but not choice 2 or 3. Choice 1 prompted participants to choose between a visit by themselves to a favorite park, store, museum or library or one that they had never visited but might enjoy. Choice 2 prompted a choice between reading a book or watching a film by familiar versus unknown creators and choice 3 asked about listening to music by a favorite musician or unfamiliar music that has been recommended. These choices were intended to be independent activities, removing a social aspect from the decision making process. However, it is possible that the first activity choice contains an implied social component; it is reasonable to expect others to be present at locations such as parks, stores, museums, or libraries. It may be that this implied social component explains this finding, where anticipated interactions with existing social connections at familiar locations could explain older adults' preference for this choice, consistent with SST.

Additionally, it is possible that the design of this task failed to capture the intended choice between familiar and unfamiliar activities. Perception of the tasks was not explored; the choices may not have been perceived by participants as being familiar and novel. Wording also differed between the three novel choices, between something *you think you might enjoy*, *seems like something you might enjoy*, and *something that has been recommended as something you might enjoy*. Interestingly, in the overall sample the novel option was selected by 58.00% for the first choice, 45.50% for the second choice, and only 26.50% for the third choice. Differences in wording, and in particular including reference to activity recommendations, may confound activity choice. Further examination of activity choices, precise wording, and perception is needed to fully understand this finding and to guide future examination of activity choice and familiarity.

An additional exploratory analysis was conducted to examine correlations of chronological and subjective age with the mean familiarity ratings of 3 self-identified activities. Both chronological and subjective age were found to be significantly positively correlated with familiarity, such that older participants chose activities they rated as more familiar. This finding suggests a possible relationship between age and activity familiarity, as hypothesized. Forced choice for only three activity sets may have been insufficient to capture the complexity of activity preference; a more comprehensive approach to activity participation and selection may be needed to fully examine these concepts.

### **Hypothesis 2**

Hypothesis 2 predicted age to moderate the relationship between activity familiarity and eudaimonic well-being; this relationship was non-significant, and no age moderation was identified. Activity familiarity was based on mean ratings of 3 self-identified activities; similar to Hypothesis 1, it may be that this approach was not adequate to capture the intricacy of activity choice, participation, and resulting impact on well-being. Well-being may not be the optimal measure of the impact of familiarity of activity, additional approaches such as ratings of satisfaction with the activity should be considered.

### **Hypothesis 2a**

Hypothesis 2a predicted overall activity level to be related to eudaimonic well-being, and for this relationship to be mediated by hedonic well-being. There were significant direct effects of overall activity level on hedonic well-being and of hedonic well-being on eudaimonic well-being, but no direct effect of overall activity level on

eudaimonic well-being. The missing physical activity subscale of the VLS-ALQ limits interpretation of these findings. Huta and Ryan (2010) suggest hedonic and eudaimonic views of well-being both overlap and reflect distinct aspects of well-being, and benefits of hedonic well-being can be expected to peak over a short term, while eudaimonic well-being shows more long-term effects. There is no universally accepted conceptualization of hedonic and eudaimonic well-being; the results of this analysis may reflect the ways that these concepts overlap, interact, and vary across individuals and across time.

### **Hypothesis 2b**

Hypothesis 2b hypothesized activities rated as highly familiar would be rated as more meaningful, automatic, and related to increased experience of flow states. No significant relationship was found between ratings of familiarity and meaningfulness or flow, while familiarity was found to be significantly positively related to automaticity, both in the sample as a whole and in each of the two age groups (18-55 & 55 and above years). Ratings of how automatic an identified activity was perceived as were included in the development of the familiarity scale, but this item was not part of the final scale. These findings together suggest automaticity as a relevant, but perhaps non-essential component of familiarity. Further examination of automaticity and familiarity may be useful in understanding these concepts.

Incidentally, ratings of activity meaningfulness were found to be significantly positively correlated with experience of flow states across all three identified activities. This pattern persisted when correlations were examined by age group. This relationship between experience of meaning and flow states is consistent with the literature on flow

states (Della Fave & Massimini, 2005; Nakamura & Csikszentmihalyi, 2001; Payne et al., 2011).

### **Hypothesis 2c**

Activities rated as more novel (lower on the familiarity scale) were hypothesized to be concurrently rated as providing sources of knowledge and long-term benefits and involving controlled processes. Little support was found for these relationships; level of effort demonstrated an inconsistent negative association with familiarity. Additional analysis of these correlations by age group did not reveal a consistent pattern of association.

The overall pattern of correlations for Hypothesis 2c was interesting: perceived future benefit correlated with activities being a source of knowledge, demanding, and effortful. This pattern of relationships suggests that these concepts related to novelty may hang together well as a construct. Further research is needed to explore if the existing familiarity scale best captures activities that are highly familiar or if familiarity and novelty are potentially better understood as two constructs and not as one construct on a continuum.

### **Hypothesis 2d**

Analysis of Hypothesis 2d did not take place, due to the non-significant outcome for Hypothesis 2. Hypothesis 2d called for controlling for effects of physical, social, and overall activity on the age-moderated relationship between activity familiarity and well-being. Additional exploratory analyses were conducted to examine correlations between mean familiarity ratings and measures of hedonic and eudaimonic well-being; none of these relationships were significant.



### **Exploratory Hypothesis**

Similar to Hypothesis 2d, analysis of the Exploratory Hypothesis, that the age-moderated relationship between activity novelty/familiarity and well-being would be partially explained by factors relating to chronological age such as physical health, marital status, subjective age, vocational status, and the Big Five personality traits of extraversion and openness to experience, was not indicated due to lack of significant findings for Hypothesis 2. Correlations with familiarity ratings and measures of well-being and the variables proposed in the Exploratory Hypothesis were examined. People lower on extraversion had higher mean familiarity ratings. Aspects of extraversion, such as reward sensitivity and sensation or excitement seeking (Aluja et al., 2003), may explain how familiar activities may appeal to individuals with lower levels of extraversion. Extraversion has been linked to recreational choice, in terms of how active, group oriented, and competitive chosen activities are (Kircaldy & Furnham, 1991); this finding suggests extraversion may also be related to how familiar chosen activities are.

### **COVID Stress Scales (CSS)**

Data collection occurred during June 2021, while the COVID-19 pandemic continued to impact daily life in the United States. Older adults reported experiencing challenges related to social interactions and activity restriction during the early weeks of the pandemic (Heid et al., 2021). The COVID Stress Scales were included in the present study to examine the negative impacts of the pandemic on well-being. To control for the impact of COVID-19 related stressors on the study hypotheses, the CSS subscales of Danger, Checking, and Contamination were included in the analyses for Hypotheses 1, 2, and 2a. Inclusion of these subscales in the models did not improve model fit significantly

for any of the analyses. While ongoing impacts of the COVID-19 pandemic on well-being and activity availability can be logically expected, use of the CSS to control for specific stressors did not impact the analyses of interest for this study.

Older adults respond to large scale events including terrorist attacks and pandemics with greater resilience than younger adults (Knepple Carney et al., 2021) and demonstrated greater engagement in helping behaviors during the COVID-19 pandemic, such as volunteering and providing support for others, which is related to increased well-being (Sin et al., 2021). It is possible that while experiencing greater disruptions to daily life during the current pandemic, older adults may have developed more effective means of coping with these stressors than younger adults.

### **Limitations**

The correlational nature of this study limits interpretation of the findings. It is impossible to differentiate between cohort effects and true aging-related change in a cross-sectional study (MacDonald & Stawski, 2016). While comparison of age differences in activity preference, participation, and well-being are possible in the study design, it is important to evaluate findings with consideration of the limitations of cross-sectional research and the interactions between age, cohort, and period effects.

Online data collection may be limited by familiarity with psychological scales and sample diversity. It should be acknowledged that some participants may participate in multiple psychological studies and therefore be familiar with commonly used psychological scales (Gosling & Mason, 2015). The current sample was limited by skewed sample diversity, with an overrepresentation of White participants across age groups (82% overall) but especially within the age 55 and older group (89%). Within

each age group, chronological age was not distributed equally; in both age groups the samples skewed towards the younger end of the range, with means of 33.24 and 61.89 years in the 18-54 and 55+ age groups respectively. Distribution of gender also varied by age group, with 39% of the younger age group identifying as female and 65% in the older age group. This study sample cannot be considered to be representative of the ethnic, generational, or socio-economic diversity of the United States, and did not allow for examination of differences in activity participation or well-being based on these relevant and important individual characteristics.

The missing physical activity subscale of the VLS-ALQ is an additional limitation- this missing data precluded analysis of the known impact of physical activity on hedonic well-being and analysis using a complete overall activity measure.

Finally, there was no previous empirical research on activity familiarity. This study provides preliminary examination of activity familiarity and novelty, development of a self-report measure of activity familiarity, and points to possible directions for future research. The current study suggests that activity familiarity is a complex construct, and analysis of how activity familiarity impacts activity choice, preference, and benefit will require additional study to better understand this multifaceted construct.

### **Future Directions**

This study provides a validated activity familiarity scale for use in future research. However, patterns of correlations from Hypothesis 2c suggest that aspects of familiarity and novelty should be examined as potentially representing separate scales or subscales of related concepts, instead of one continuous scale. Future studies should continue development of an effective measure of activity familiarity and novelty.

While the current study found limited support for a relationship between age and activity familiarity preference, it is clear that more advanced methods of data collection and examination of activity are needed to examine age-related differences in activity familiarity and well-being. Suggestions for future directions include use of ecological momentary assessment (EMA) of both activity participation and well-being, qualitative research on activity preferences and familiarity across age groups, and longitudinal examination of activity familiarity as individuals age. EMA has been used to collect a range of data and shows promise for use with older adults (Cain et al., 2009). Qualitative research is needed to add depth and understanding to how activity familiarity is perceived and to refine research questions related to activity choice. Cross-sectional research has known limitations for examining age-related phenomena, so longitudinal research is needed to further examine trajectories of change across the lifespan. Ongoing experimental research involving behavioral treatments for depression or enhancing well-being in older adults may benefit from examining the impact of familiarity on individual response to interventions. Along with activities with social or physical components, familiar activities show promise for offering additional benefits for older adults, and exploration of life experiences and preferences to identify familiar activities is congruent with provision of person-centered care. Finally, continued examination of the ongoing effects of the COVID-19 pandemic on activity and well-being across age groups is needed to better understand research findings in this context.

Overall, these findings highlight the complexity of research on activity participation and preferences, and the need for techniques such as ecological momentary assessment, qualitative research, and longitudinal studies to better capture complex

constructs such as activity familiarity and participation. These age-related differences in the relationship between activity familiarity and well-being have a strong theoretical basis. Future research may contribute to a lifespan theory of activity benefits and will be useful in personalizing interventions that increase well-being, such as weighting selection of activities in behavioral activation treatments or designing activity programs for older adults.

## REFERENCES

- Adams, K. B., Leibbrandt, S., & Moon, H. (2011). A critical review of the literature on social and leisure activity and wellbeing in later life. *Ageing & Society*, 31(4), 683-712. <https://doi.org/10.1017/S0144686X10001091>
- Aluja, A., Garcia, O., & Garcia, L. F. (2003). Relationships among extraversion, openness to experience, and sensation seeking. *Personality and Individual Differences*, 35(3), 671-680. [https://doi.org/10.1016/S0191-8869\(02\)00244-1](https://doi.org/10.1016/S0191-8869(02)00244-1)
- American Psychological Association, (2006). Behavioral Activation for Depression. Retrieved from <https://www.div12.org/treatment/behavioral-activation-for-depression/>
- Baltes, P.B. (1997). On the incomplete architecture of human ontogeny. Selection, optimization, and compensation as foundation of developmental theory. *American Psychologist*, 52, 366-380. <https://doi.org/10.1037/0003-066X.52.4.366>
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. *Successful aging: Perspectives from the behavioral sciences* (pp. 1-34). <https://doi.org/10.1017/CBO9780511665684.003>
- Baltes, P. B., Baltes, M. M., Freund, A. M., & Lang, F. R. (1999). The measure of selection, optimization, and compensation (SOC) by self- report: Technical report

1999. Berlin: Max Planck Institute for Human Development.

<https://doi.org/10.1037/t04704-000>

Baltes, B. B., & Rudolph, C. W. (2012). The theory of selection, optimization, and compensation. In M. Wang (Ed.), *The Oxford handbook of retirement* (pp. 88-

101). <https://doi.org/10.1093/oxfordhb/9780199746521.013.0044>

Bakker, A. (2008). The work-related flow inventory: Construction and initial validation of the WOLF. *Journal of Vocational Behavior*, 72(3), 400-414.

<https://doi.org/10.1016/j.jvb.2007.11.007>

Barak, B., & Stern, B. (1986). Subjective age correlates: A research note. *The*

*Gerontologist*, 26(5), 571-578. <https://doi.org/10.1093/geront/26.5.571>

Barrett, A. E., & Montepare, J. M. (2015). "It's About Time": Applying Life Span and Life Course Perspectives to the Study of Subjective Age. *Annual Review of*

*Gerontology & Geriatrics*, 35, 55. <https://doi.org/10.1891/0198-8794.35.55>

Berinsky, A. J., Margolis, M. F., & Sances, M. W. (2014). Separating the shirkers from the workers? Making sure respondents pay attention on self-administered surveys. *American Journal of Political Science*, 58(3), 739-753.

<https://doi.org/10.1111/ajps.12081>

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S.

L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Frontiers in public health*, 6, 149.

<https://doi.org/10.3389/fpubh.2018.00149>

Bonaiuto, M., Mao, Y., Roberts, S., Psalti, A., Ariccio, S., Ganucci Cancellieri, U., &

Csikszentmihalyi, M. (2016). Optimal experience and personal growth: Flow and

the consolidation of place identity. *Frontiers in Psychology*, 7, 1654.

<https://doi.org/10.3389/fpsyg.2016.01654>

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., et al. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, 395(10227), 912–920.

[https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8).

Buhrmester, M. D., Talafar, S., & Gosling, S. D. (2018). An evaluation of Amazon's Mechanical Turk, its rapid rise, and its effective use. *Perspectives on Psychological Science*, 13(2), 149-154.

<https://doi.org/10.1177/1745691617706516>

Cain, A. E., Depp, C. A., & Jeste, D. V. (2009). Ecological momentary assessment in aging research: a critical review. *Journal of psychiatric research*, 43(11), 987-996. <https://doi.org/10.1016/j.jpsychires.2009.01.014>

Carstensen, L. L., Fung, H. H., & Charles, S. T. (2003). Socioemotional Selectivity Theory and the Regulation of Emotion in the Second Half of Life. *Motivation & Emotion*, 27(2), 103–123. <https://doi.org/10.1023/A:1024569803230>

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology*, 56, 453-484.

<https://doi.org/10.1146/annurev.psych.55.090902.141913>

Choi, D., & Kim, J. (2004). Why people continue to play online games: In search of critical design factors to increase customer loyalty to online contents. *Cyber Psychology & Behavior*, 7, 11-24.

<https://doi.org/10.1089/109493104322820066>



- Cohen, J. (1988). 1988: Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum.
- Cohen-Mansfield, J., Libin, A., & Marx, M. S. (2007). Nonpharmacological treatment of agitation: a controlled trial of systematic individualized intervention. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 62(8), 908-916. <https://doi.org/10.1093/gerona/62.8.908>
- Crawford, D. W., Godbey, G., & Crouter, A. C. (1986). The stability of leisure preferences. *Journal of Leisure Research*, 18(2), 96-115. <https://doi.org/10.1080/00222216.1986.11969649>
- Crawford, J. R., & Henry, J. D. (2004). The Positive and Negative Affect Schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *British journal of clinical psychology*, 43(3), 245-265. <https://doi.org/10.1348/0144665031752934>
- Deci, E. L., & Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: an introduction. *Journal Of Happiness Studies*, 9(1), 1-11. <https://doi.org/10.1007/s10902-006-9018-1>
- Diamond A. (2013). Executive functions. *Annual review of psychology*, 64, 135–168. <https://doi.org/10.1146/annurev-psych-113011-143750>
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment*, 49(1), 71-75. [https://doi.org/10.1207/s15327752jpa4901\\_13](https://doi.org/10.1207/s15327752jpa4901_13)

- Diener, E., Lucas, R. E., & Oishi, S. (2018). Advances and open questions in the science of subjective well-being. *Collabra. Psychology*, 4(1).  
<https://doi.org/10.1525/collabra.115>
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social indicators research*, 97(2), 143-156.  
<https://doi.org/10.1007/s11205-009-9493-y>
- Disabato, D. J., Goodman, F. R., Kashdan, T. B., Short, J. L., & Jarden, A. (2016). Different types of well-being? A cross-cultural examination of hedonic and eudaimonic well-being. *Psychological assessment*, 28(5), 471.  
<https://doi.org/10.1037/pas0000209>
- Della Fave, A., & Massimini, F. (2005). The Investigation of Optimal Experience and Apathy: Developmental and Psychosocial Implications. *European Psychologist*, 10(4), 264–274. <https://doi.org/10.1027/1016-9040.10.4.264>
- English, T., & Carstensen, L. L. (2014). Selective narrowing of social networks across adulthood is associated with improved emotional experience in daily life. *International journal of behavioral development*, 38(2), 195-202.  
<https://doi.org/10.1177/0165025413515404>
- Fazio, S., Pace, D., Flinner, J., & Kallmyer, B. (2018). The fundamentals of person-centered care for individuals with dementia. *The Gerontologist*, 58(suppl\_1), S10-S19. <https://doi.org/10.1093/geront/gnx122>
- Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5<sup>th</sup> ed.). SAGE Publications, Inc.

- Fitzpatrick, K. M., Harris, C., & Drawve, G. (2020). Living in the midst of fear: Depressive symptomatology among US adults during the COVID-19 pandemic. *Depression and anxiety*. <https://doi.org/10.1002/da.23080>
- Fjell, A. M., & Walhovd, K. B. (2010). Structural brain changes in aging: courses, causes and cognitive consequences. *Reviews in the Neurosciences*, 21(3), 187-222. <https://doi.org/10.1515/REVNEURO.2010.21.3.187>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American psychologist*, 56(3), 218. <https://doi.org/10.1037/0003-066X.56.3.218>
- Fredrickson, B. L., & Carstensen, L. L. (1990). Choosing social partners: How old age and anticipated endings make people more selective. *Psychology and Aging*, 5(3), 335. <https://doi.org/10.1037/0882-7974.5.3.335>
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological science*, 13(2), 172-175. <https://doi.org/10.1111/1467-9280.00431>
- Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American psychologist*, 60(7), 678. <https://doi.org/10.1037/0003-066X.60.7.678>
- Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M. (2000). The undoing effect of positive emotions. *Motivation and emotion*, 24(4), 237-258. <https://doi.org/10.1023/A:1010796329158>
- Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions

following the terrorist attacks on the United States on September 11th, 2001.

Journal of personality and social psychology, 84(2), 365.

<https://doi.org/10.1037/0022-3514.84.2.365>

Fung, H. H., Carstensen, L. L., & Lutz, A. M. (1999). Influence of time on social preferences: Implications for life-span development. *Psychology and aging*, 14(4), 595. <https://doi.org/10.1037/0882-7974.14.4.595>

Fung, H. H., Lai, P., & Ng, R. (2001). Age differences in social preferences among Taiwanese and Mainland Chinese: the role of perceived time. *Psychology and aging*, 16(2), 351. <https://doi.org/10.1037/0882-7974.16.2.351>

Garland, E. L., Fredrickson, B., Kring, A. M., Johnson, D. P., Meyer, P. S., & Penn, D. L. (2010). Upward spirals of positive emotions counter downward spirals of negativity: Insights from the broaden-and-build theory and affective neuroscience on the treatment of emotion dysfunctions and deficits in psychopathology. *Clinical psychology review*, 30(7), 849-864.

<https://doi.org/10.1016/j.cpr.2010.03.002>

Gitlin, L. N., Winter, L., Burke, J., Chernett, N., Dennis, M. P., & Hauck, W. W. (2008). Tailored activities to manage neuropsychiatric behaviors in persons with dementia and reduce caregiver burden: a randomized pilot study. *The American Journal of Geriatric Psychiatry*, 16(3), 229-239.

<https://doi.org/10.1097/01.JGP.0000300629.35408.94>

Gosling, S. D., & Mason, W. (2015). Internet research in psychology. *Annual review of psychology*, 66, 877-902. <https://doi.org/10.1146/annurev-psych-010814-015321>

- Gosling, S. D., Rentfrow, P. J., & Swann Jr, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in personality*, 37(6), 504-528. [https://doi.org/10.1016/S0092-6566\(03\)00046-1](https://doi.org/10.1016/S0092-6566(03)00046-1)
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American psychologist*, 59(2), 93. <https://doi.org/10.1037/0003-066X.59.2.93>
- Griffin, P.W., Mroczek, D.K., & Wesbecher, K. (2015). Personality development across the life span: Theory, research, and application. In P.A. Lichtenberg & B.T. Mast (Eds.), *APA Handbook of Clinical Geropsychology* (pp. 217-234). Washington, D.C.: American Psychological Association. <http://dx.doi.org/10.1037/14458-010>
- Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of biomedical informatics*, 42(2), 377-381. <https://doi.org/10.1016/j.jbi.2008.08.010>
- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3<sup>rd</sup> ed.). Guilford Publications.
- Heid, A. R., Cartwright, F., Wilson-Genderson, M., & Pruchno, R. (2021). Challenges experienced by older people during the initial months of the COVID-19 pandemic. *The Gerontologist*, 61(1), 48-58. <https://doi.org/10.1093/geront/gnaa138>

- Heiervang, E., & Goodman, R. (2011). Advantages and limitations of web-based surveys: evidence from a child mental health survey. *Social psychiatry and psychiatric epidemiology*, 46(1), 69-76. <https://doi.org/10.1007/s00127-009-0171-9>
- Howell, D. C. (2012). *Statistical methods for psychology*. Cengage Learning.
- Hoyle, R. H., & Isherwood, J. C. (2013). Reporting results from structural equation modeling analyses in Archives of Scientific Psychology. *Archives of scientific psychology*, 1(1), 14-22. <http://dx.doi.org/10.1037/arc0000004>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
- Huta, V., & Ryan, R. M. (2010). Pursuing pleasure or virtue: The differential and overlapping well-being benefits of hedonic and eudaimonic motives. *Journal of happiness studies*, 11(6), 735-762. <https://doi.org/10.1007/s10902-009-9171-4>
- Huxhold, O., Fiori, K. L., & Windsor, T. D. (2013). The dynamic interplay of social network characteristics, subjective well-being, and health: The costs and benefits of socio-emotional selectivity. *Psychology and Aging*, 28(1), 3. <https://doi.org/10.1037/a0030170>
- Iso-Ahola, S. E., Jackson, E., & Dunn, E. (1994). Starting, ceasing, and replacing leisure activities over the life-span. *Journal of leisure research*, 26(3), 227-249. <https://doi.org/10.1080/00222216.1994.11969958>

- Iwasaki, Y. (2007). Leisure and quality of life in an international and multicultural context: What are major pathways linking leisure to quality of life?. *Social Indicators Research*, 82(2), 233-264. <https://doi.org/10.1007/s11205-006-9032-z>
- Jackson, S. A., Martin, A. J., & Eklund, R. C. (2008). Long and short measures of flow: The construct validity of the FSS-2, DFS-2, and new brief counterparts. *Journal of Sport and Exercise Psychology*, 30(5), 561-587. <https://doi.org/10.1123/jsep.30.5.561>
- Janke, M. C., Son, J. S., & Payne, L. L. (2009). Self-regulation and adaptation of leisure activities among adults with arthritis. *Activities, Adaptation & Aging*, 33(2), 65-80. <https://doi.org/10.1080/01924780902947058>
- Joiner, T. E., Lewinsohn, P. M., & Seeley, J. R. (2002). The core of loneliness: lack of pleasurable engagement--more so than painful disconnection--predicts social impairment, depression onset, and recovery from depressive disorders among adolescents. *Journal of Personality Assessment*, 79(3), 472-491. [https://doi.org/10.1207/S15327752JPA7903\\_05](https://doi.org/10.1207/S15327752JPA7903_05)
- Jopp, D. S., & Hertzog, C. (2010). Assessing adult leisure activities: An extension of a self-report activity questionnaire. *Psychological assessment*, 22(1), 108. <https://doi.org/10.1037/a0017662>
- Joshanloo, M. (2016). Revisiting the empirical distinction between hedonic and eudaimonic aspects of well-being using exploratory structural equation modeling. *Journal of Happiness Studies*, 17(5), 2023-2036. <https://doi.org/10.1007/s10902-015-9683-z>

- Jovanović, V. (2015). Beyond the PANAS: Incremental validity of the Scale of Positive and Negative Experience (SPANE) in relation to well-being. *Personality and Individual Differences*, 86, 487-491. <https://doi.org/10.1016/j.paid.2015.07.015>
- Kaiser, H. F., & Rice, J. (1974). Little Jiffy, mark IV. *Educational and psychological measurement*, 34(1), 111-117. <https://doi.org/10.1177/001316447403400115>
- Kanter, J. W., Puspitasari, A. J., Santos, M. M., & Nagy, G. A. (2012). Behavioural activation: history, evidence and promise. *The British Journal of Psychiatry*, 200(5), 361-363. <https://doi.org/10.1192/bjp.bp.111.103390>
- Kirkcaldy, B., & Furnham, A. (1991). Extraversion, neuroticism, psychoticism and recreational choice. *Personality and individual differences*, 12(7), 737-745. [https://doi.org/10.1016/0191-8869\(91\)90229-5](https://doi.org/10.1016/0191-8869(91)90229-5)
- Knepple Carney, A., Graf, A. S., Hudson, G., & Wilson, E. (2021). Age moderates perceived COVID-19 disruption on well-being. *The Gerontologist*, 61(1), 30-35. <https://doi.org/10.1093/geront/gnaa106>
- Kolanowski, A., Litaker, M., Buettner, L., Moeller, J., & Costa, Jr, P. T. (2011). A randomized clinical trial of theory-based activities for the behavioral symptoms of dementia in nursing home residents. *Journal of the American Geriatrics Society*, 59(6), 1032-1041. <https://doi.org/10.1111/j.1532-5415.2011.03449.x>
- Kotter-Grühn, D., Kleinspehn-Ammerlahn, A., Gerstorf, D., & Smith, J. (2009). Self-perceptions of aging predict mortality and change with approaching death: 16-year longitudinal results from the Berlin Aging Study. *Psychology and aging*, 24(3), 654. <https://doi.org/10.1037/a0016510>



- Ku, P. W., Fox, K. R., & Chen, L. J. (2016). Leisure-time physical activity, sedentary behaviors and subjective well-being in older adults: An eight-year longitudinal research. *Social Indicators Research*, 127(3), 1349-1361.  
<https://doi.org/10.1007/s11205-015-1005-7>
- Larson, R., & Csikszentmihalyi, M. (2014). The experience sampling method. In *Flow and the foundations of positive psychology* (pp. 21-34). Springer, Dordrecht.  
[https://doi.org/10.1007/978-94-017-9088-8\\_2](https://doi.org/10.1007/978-94-017-9088-8_2)
- Lavie, N. (2010). Attention, distraction, and cognitive control under load. *Current Directions in Psychological Science*, 19(3), 143-148.  
<http://dx.doi.org/10.1177/0963721410370295>
- Lonczak, H.S. (2019, August 28). How to measure flow with scales and questionnaires [Web log post]. Retrieved from <https://positivepsychology.com/how-to-measure-flow-scales-questionnaires/>
- MacDonald, S.W.S., & Stawski, R.S. (2016). Methodological considerations for the study of adult development and aging. In K.W. Schaie & S.L. Willis (Eds.), *Handbook of the psychology of aging*, 8<sup>th</sup> Edition (pp. 15-40). New York: Elsevier. <https://doi.org/10.1016/B978-0-12-411469-2.00002-9>
- Martin, M., & Hofer, S. M. (2004). Intraindividual variability, change, and aging: Conceptual and analytical issues. *Gerontology*, 50(1), 7-11.  
<https://doi.org/10.1159/000074382>
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior research methods*, 44(1), 1-23. <https://doi.org/10.3758/s13428-011-0124-6>

- Mazzucchelli, T. G., Kane, R. T., & Rees, C. S. (2010). Behavioral activation interventions for well-being: A meta-analysis. *Journal of Positive Psychology*, 5(2), 105–121. <https://doi.org/10.1080/17439760903569154>
- McHorney, C. A., Ware Jr, J. E., Lu, J. R., & Sherbourne, C. D. (1994). The MOS 36-item Short-Form Health Survey (SF-36): III. Tests of data quality, scaling assumptions, and reliability across diverse patient groups. *Medical care*, 40-66. <https://doi.org/10.1097/00005650-199401000-00004>
- McHorney, C. A., Ware Jr, J. E., & Raczek, A. E. (1993). The MOS 36-Item Short-Form Health Survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical care*, 247-263. <https://doi.org/10.1097/00005650-199303000-00006>
- Meeks, S., Shryock, S. K., & Vandenbroucke, R. J. (2017). Theatre involvement and well-being, age differences, and lessons from long-time subscribers. *The Gerontologist*, 58(2), 278-289. <https://doi.org/10.1093/geront/gnx029>
- Montepare, J. (2018). Subjective age-Different measures yield different self-appraisals and age identities. *Innovation in Aging*, 2(Suppl 1), 693. <https://doi.org/10.1093/geroni/igy023.2576>
- Nakamura, J., & Csikszentmihalyi, M. (2001). The concept of flow. In Snyder, C. R., & Lopez, S. J. (Eds.), *Handbook of positive psychology* (pp. 89-105). New York, NY: Oxford University Press.
- Nakamura, J., & Csikszentmihalyi, M. (2014). The concept of flow. In *Flow and the foundations of positive psychology* (pp. 239-263). Springer, Dordrecht. [https://doi.org/10.1007/978-94-017-9088-8\\_16](https://doi.org/10.1007/978-94-017-9088-8_16)

- Neiss, M., & Almeida, D. M. (2004). Age differences in the heritability of mean and intraindividual variation of psychological distress. *Gerontology*, 50(1), 22-27. <https://doi.org/10.1159/000074385>
- Nimrod, G. (2007). Expanding, reducing, concentrating, and diffusing: Post retirement leisure behavior and life satisfaction. *Leisure Sciences*, 29(1), 91-111. <https://doi.org/10.1080/01490400600983446>
- Oerlemans, W. G., Bakker, A. B., & Veenhoven, R. (2011). Finding the key to happy aging: A day reconstruction study of happiness. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 66(6), 665-674. <https://doi.org/10.1093/geronb/gbr040>
- Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of experimental social psychology*, 45(4), 867-872. <https://doi.org/10.1016/j.jesp.2009.03.009>
- Panchal, N., Kamal, R., Orgera, K., Cox, C., Garfield, R., Hamel, L., et al. (2020). The implications of COVID-19 for mental health and substance use. San Francisco: Henry J. Kaiser Family Foundation.
- Pavot, W. (2018). The cornerstone of research on subjective well-being: Valid assessment methodology. In Diener E, Oishi S, & Tay L (Eds.), *Handbook of Well-Being*. Noba Scholar Handbook Series: Subjective Well-Being. Salt Lake City, UT: DEF Publishers.
- Pavot, W., & Diener, E. (2009). Review of the satisfaction with life scale. In *Assessing well-being* (pp. 101-117). Springer, Dordrecht. [https://doi.org/10.1007/978-90-481-2354-4\\_5](https://doi.org/10.1007/978-90-481-2354-4_5)

- Payne, B. R., Jackson, J. J., Noh, S. R., & Stine-Morrow, E. A. (2011). In the zone: Flow state and cognition in older adults. *Psychology and aging*, 26(3), 738.  
<https://doi.org/10.1037/a0022359>
- Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian journal of psychiatry*, 102066. <https://doi.org/10.1016/j.ajp.2020.102066>
- Ransing, R., Ramalho, R., Orsolini, L., Adiukwu, F., Gonzalez-Diaz, J. M., Larnaout, A., ... & Patil, I. (2020). Can COVID-19 related mental health issues be measured?: Assessment options for mental health professionals. *Brain, Behavior, and Immunity*. <https://doi.org/10.1016/j.bbi.2020.05.049>
- Rathouz, P. J., Kasper, J. D., Zeger, S. L., Ferrucci, L., Bandeen-Roche, K., Miglioretti, D. L., & Fried, L. P. (1998). Short-term consistency in self-reported physical functioning among elderly women: the Women's Health and Aging Study. *American Journal of Epidemiology*, 147(8), 764-773.  
<https://doi.org/10.1093/oxfordjournals.aje.a009521>
- Reuter-Lorenz, P.A., Festini, S.B., & Jantz, T.K. (2016). Executive functions and neurocognitive aging. In K.W. Schaie & S.L. Willis (Eds.), *Handbook of the Psychology of Aging*, 8<sup>th</sup> Edition (pp. 245-262). New York: Elsevier.  
<http://dx.doi.org/10.1016/B978-0-12-411469-2.00013-3>.
- Rice, S. P., & Shorey-Fennell, B. R. (2020). Comparing the psychometric properties of common measures of positive and negative emotional experiences: implications for the assessment of subjective wellbeing. *Journal of Well-Being Assessment*, 1-20. <https://doi.org/10.1007/s41543-020-00025-1>

- Rice, S., Winter, S. R., Doherty, S., & Milner, M. (2017). Advantages and disadvantages of using internet-based survey methods in aviation-related research. *Journal of Aviation Technology and Engineering*, 7(1), 5. <https://doi.org/10.7771/2159-6670.1160>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of personality and social psychology*, 57(6), 1069-1081. <https://doi.org/10.1037/0022-3514.57.6.1069>
- Ryff, C. D., Heller, A. S., Schaefer, S. M., Van Reekum, C., & Davidson, R. J. (2016). Purposeful engagement, healthy aging, and the brain. *Current behavioral neuroscience reports*, 3(4), 318-327. doi: [10.1007/s40473-016-0096-z](https://doi.org/10.1007/s40473-016-0096-z)
- Sanderson, W. C., Arunagiri, V., Funk, A. P., Ginsburg, K. L., Krychiw, J. K., Limowski, A. R., ... & Stout, Z. (2020). The Nature and Treatment of Pandemic-Related Psychological Distress. *Journal of Contemporary Psychotherapy*, 1-13. <https://doi.org/10.1007/s10879-020-09463-7>
- Schneider, W., Dumais, S. T., & Shiffrin, R. M. (1984). Automatic and controlled processing and attention. In R. Parasuraman, R. Davis, & J. Beatty (Eds.), *Varieties of attention* (pp. 1-27). New York: Academic Press.
- Schueller, S. M., & Seligman, M. E. (2010). Pursuit of pleasure, engagement, and meaning: Relationships to subjective and objective measures of well-being. *The*

Journal of Positive Psychology, 5(4), 253-263.

<https://doi.org/10.1080/17439761003794130>

- Schwartz, S. J. (2006). Predicting identity consolidation from self-construction, eudaimonistic self-discovery, and agentic personality. *Journal of Adolescence*, 29(5), 777-793. <https://doi.org/10.1016/j.adolescence.2005.11.008>
- Schwartz, S. J., & Waterman, A. S. (2006). Changing interests: A longitudinal study of intrinsic motivation for personally salient activities. *Journal of Research in Personality*, 40(6), 1119-1136. <https://doi.org/10.1016/j.jrp.2005.12.003>
- Seppälä, P., Mauno, S., Feldt, T., Hakanen, J., Kinnunen, U., Tolvanen, A., & Schaufeli, W. (2009). The construct validity of the Utrecht Work Engagement Scale: Multisample and longitudinal evidence. *Journal of Happiness Studies*, 10(4), 459. <https://doi.org/10.1007/s10902-008-9100-y>
- Sheldon, K. M., Corcoran, M., & Prentice, M. (2019). Pursuing eudaimonic functioning versus pursuing hedonic well-being: The first goal succeeds in its aim, whereas the second does not. *Journal of Happiness Studies*, 20(3), 919-933. <https://doi.org/10.1007/s10902-018-9980-4>
- Shryock, S.K. & Meeks, S. (2018, November). Internal consistency and factorial validity of the 42-item psychological well-being scales. Poster session presented at the Gerontological Society of American Conference, Boston, MA. <https://doi.org/10.1093/geroni/igy023.2568>
- Sin, N. L., Klaiber, P., Wen, J. H., & DeLongis, A. (2021). Helping amid the pandemic: Daily affective and social implications of COVID-19-related prosocial activities. *The Gerontologist*, 61(1), 59-70. <https://doi.org/10.1093/geront/gnaa140>

- Taylor, S., Landry, C., Paluszek, M., Fergus, T. A., McKay, D., & Asmundson, G. J. (2020). Development and initial validation of the COVID Stress Scales. *Journal of Anxiety Disorders*, 102232. <https://doi.org/10.1016/j.janxdis.2020.102232>
- Thomas, K. A., & Clifford, S. (2017). Validity and Mechanical Turk: An assessment of exclusion methods and interactive experiments. *Computers in Human Behavior*, 77, 184-197. <https://doi.org/10.1016/j.chb.2017.08.038>
- van Dierendonck, D. (2004). The construct validity of Ryff's Scales of Psychological Well-being and its extension with spiritual well-being. *Personality & Individual Differences*, 36(3), 629-643. [https://doi.org/10.1016/S0191-8869\(03\)00122-3](https://doi.org/10.1016/S0191-8869(03)00122-3)
- Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: the evidence. *CMAJ*, 174(6), 801-809. <https://doi.org/10.1503/cmaj.051351>
- Waterman, A. S., Schwartz, S. J., Goldbacher, E., Green, H., Miller, C., & Philip, S. (2003). Predicting the subjective experience of intrinsic motivation: The roles of self-determination, the balance of challenges and skills, and self-realization values. *Personality and Social Psychology Bulletin*, 29(11), 1447-1458. <https://doi.org/10.1177/0146167203256907>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, 54(6), 1063. <https://doi.org/10.1037/0022-3514.54.6.1063>
- Westerhof, G. J., Miche, M., Brothers, A. F., Barrett, A. E., Diehl, M., Montepare, J. M., ... & Wurm, S. (2014). The influence of subjective aging on health and longevity:

A meta-analysis of longitudinal data. *Psychology and Aging*, 29(4), 793.

<https://doi.org/10.1037/a0038016>

Westerhof, G. J., & Wurm, S. (2018). Subjective Aging and Health. In *Oxford Research Encyclopedia of Psychology*.

<https://doi.org/10.1093/acrefore/9780190236557.013.4>

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and psychological measurement*, 73(6), 913-934.

<https://doi.org/10.1177/0013164413495237>

Wurm, S., & Westerhof, G. J. (2015). Longitudinal research on subjective aging, health, and longevity: Current evidence and new directions for research. *Annual Review of Gerontology and Geriatrics*, 35(1), 145-165. [https://doi.org/10.1891/0198-](https://doi.org/10.1891/0198-8794.35.145)

[8794.35.145](https://doi.org/10.1891/0198-8794.35.145)

Zawadzki, M. J., Smyth, J. M., & Costigan, H. J. (2015). Real-time associations between engaging in leisure and daily health and well-being. *Annals of Behavioral Medicine*, 49(4), 605-615. <https://doi.org/10.1007/s12160-015-9694-3>

<https://doi.org/10.1007/s12160-015-9694-3>



## Appendices

### Appendix A: Measures of Well-being

#### A1. Scale of Positive and Negative Experience (SPANE) (Diener et al., 2010)

Copyright by Ed Diener and Robert Biswas-Diener, January 2009.

Please think about what you have been doing and experiencing during the past 4 weeks. Then report how much you experienced each of the following feelings, using the scale below. For each item, select a number from 1 to 5, and indicate that number on your response sheet.

1. Very rarely or never
2. Rarely
3. Sometimes
4. Often
5. Very often or always

Positive  
Negative  
Good  
Bad  
Pleasant  
Unpleasant  
Happy  
Sad  
Afraid  
Joyful  
Angry  
Contented

Scoring: The measure can be used to derive an overall affect balance score, but can also be divided into positive and negative feelings scales.

- Positive feelings (SPANE-P): Add the scores, varying from 1 to 5, for the six items: positive, good, pleasant, happy, joyful, and contented. The score can vary from 6 (lowest possible) to 30 (highest positive feelings score).
- Negative feelings (SPANE-N): Add the scores, varying from 1 to 5, for the six items: negative, bad, unpleasant, sad, afraid, and angry. The score can vary from 6 (lowest possible) to 30 (highest negative feelings score).
- Affect balance (SPANE-B): The negative feelings score is subtracted from the positive feelings score, and the resultant difference score can vary from -24 (unhappiest possible) to 24 (highest affect balance possible). A respondent with a very high score of 24 reports that she or he rarely or never experiences any of the negative feelings, and very often or always has all of the positive feelings.

**A2. The Positive and Negative Affect Scales (PANAS) (Watson, Clark, & Tellegan, 1988)**

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past few weeks. Use the following scale to record your answers:

- 1- Very slightly or not at all
- 2- A little
- 3- Moderately
- 4- Quite a bit
- 5- Extremely

1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud
11. Irritable
12. Alert
13. Ashamed
14. Inspired
15. Nervous
16. Determined
17. Attentive
18. Jittery
19. Active
20. Afraid

*Scoring:*

*Positive Affect Score:* Add the scores on items 1, 3, 5, 9, 10, 12, 14, 16, 17, and 19. Scores can range from 10 – 50, with higher scores representing higher levels of positive affect.

*Negative Affect Score:* Add the scores on items 2, 4, 6, 7, 8, 11, 13, 15, 18, and 20. Scores can range from 10 – 50, with lower scores representing lower levels of negative affect.

### **A3. Satisfaction with Life Scale (SWLS) ) (Pavot & Diener, 2009).**

*Instructions:* Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

- \_\_\_\_\_ In most ways my life is close to my ideal.
- \_\_\_\_\_ The conditions of my life are excellent.
- \_\_\_\_\_ I am satisfied with my life.
- \_\_\_\_\_ So far I have gotten the important things I want in life.
- \_\_\_\_\_ If I could live my life over, I would change almost nothing.

#### **Scoring:**

Though scoring should be kept continuous (sum up scores on each item), here are some cut- offs to be used as benchmarks.

- 31-35: Extremely Satisfied
- 26-30 Satisfied
- 21-25: Slightly Satisfied
- 20 Neutral
- 15-19: Slightly Dissatisfied
- 10-14: Dissatisfied
- 5-9: Extremely Dissatisfied

### **A4. Psychological Well-being- 42 Item Scale (PWS) (Ryff, 1989)**

**Answer Format:** 1 = strongly agree; 2 = somewhat agree; 3 = a little agree; 4 = neither agree or disagree; 5 = a little disagree; 6 = somewhat disagree; 7 = strongly disagree.

**Instructions:** Circle one response below each statement to indicate how much you agree or disagree.

1. "I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.
2. "For me, life has been a continuous process of learning, changing, and growth."
3. "In general, I feel I am in charge of the situation in which I live."
4. "People would describe me as a giving person, willing to share my time with others."
5. "I am not interested in activities that will expand my horizons."
6. "I enjoy making plans for the future and working to make them a reality."
7. "Most people see me as loving and affectionate."
8. "In many ways I feel disappointed about my achievements in life."
9. "I live life one day at a time and don't really think about the future."
10. "I tend to worry about what other people think of me."
11. "When I look at the story of my life, I am pleased with how things have turned out."
12. "I have difficulty arranging my life in a way that is satisfying to me."
13. "My decisions are not usually influenced by what everyone else is doing."
14. "I gave up trying to make big improvements or changes in my life a long time ago."
15. "The demands of everyday life often get me down."
16. "I have not experienced many warm and trusting relationships with others."
17. "I think it is important to have new experiences that challenge how you think about yourself and the world."
18. "Maintaining close relationships has been difficult and frustrating for me."
19. "My attitude about myself is probably not as positive as most people feel about themselves."

20. "I have a sense of direction and purpose in life."
21. "I judge myself by what I think is important, not by the values of what others think is important."
22. "In general, I feel confident and positive about myself."
23. "I have been able to build a living environment and a lifestyle for myself that is much to my liking."
24. "I tend to be influenced by people with strong opinions."
25. "I do not enjoy being in new situations that require me to change my old familiar ways of doing things."
26. "I do not fit very well with the people and the community around me."
27. "I know that I can trust my friends, and they know they can trust me."
28. "When I think about it, I haven't really improved much as a person over the years."
29. "Some people wander aimlessly through life, but I am not one of them."
30. "I often feel lonely because I have few close friends with whom to share my concerns."
31. "When I compare myself to friends and acquaintances, it makes me feel good about who I am."
32. "I don't have a good sense of what it is I'm trying to accomplish in life."
33. "I sometimes feel as if I've done all there is to do in life."
34. "I feel like many of the people I know have gotten more out of life than I have."
35. "I have confidence in my opinions, even if they are contrary to the general consensus."
36. "I am quite good at managing the many responsibilities of my daily life."
37. "I have the sense that I have developed a lot as a person over time."
38. "I enjoy personal and mutual conversations with family members and friends."
39. "My daily activities often seem trivial and unimportant to me."
40. "I like most parts of my personality."
41. "It's difficult for me to voice my own opinions on controversial matters."
42. "I often feel overwhelmed by my responsibilities."

**Scoring:**

Q1, Q2, Q3, Q4, Q6, Q7, Q11, Q13, Q17, Q20, Q21, Q22, Q23, Q27, Q29, Q31, Q35, Q36, Q37, Q38, and Q40 should be reverse-scored. Reverse-scored items are worded in the opposite direction of what the scale is measuring.

The Autonomy subscale items are Q1R, Q13R, Q24, Q35R, Q41, Q10, and Q21R.

The Environmental Mastery subscale items are Q3R, Q15, Q26, Q36R, Q42, Q12, and Q23R.

The Personal Growth subscale items are Q5, Q17R, Q28, Q37R, Q2R, Q14, and Q25.

The Positive Relations with Others subscale items are Q7R, Q18, Q30, Q38R, Q4R, Q16, and Q27R.

The Purpose in Life subscale items are Q9, Q20R, Q32, Q39, Q6R, Q29R, and Q33.

The Self-Acceptance subscale items are Q11R, Q22R, Q34, Q40R, Q8, Q19, and Q31.

## A5. COVID Stress Scales (Taylor et al., 2020)

The following asks about various kinds of worries that you might have experienced over the past seven days. In the following statements, we refer to COVID-19 as "the virus".

- 0 Not at all
- 1 Slightly
- 2 Moderately
- 3 Very
- 4 Extremely

Danger	I am worried about catching the virus
Danger	I am worried that basic hygiene (e.g., handwashing) is not enough to keep me safe from the virus
Danger	I am worried that our healthcare system is unable to keep me safe from the virus
Danger	I am worried that I can't keep my family safe from the virus
Danger	I am worried that our healthcare system won't be able to protect my loved ones
Danger	I am worried that social distancing is not enough to keep me safe from the virus
Socio-economic consequences	I am worried about grocery stores running out of food
Socio-economic consequences	I am worried about grocery stores running out of cold or flu remedies
Socio-economic consequences	I am worried about pharmacies running out of prescription medicines
Socio-economic consequences	I am worried about grocery stores running out of water
Socio-economic consequences	I am worried about grocery stores running out of cleaning or disinfectant supplies
Socio-economic consequences	I am worried that grocery stores will close down
Xenophobia	I am worried that foreigners are spreading the virus in my country
Xenophobia	If I met a person from a foreign country, I'd be worried that they might have the virus
Xenophobia	I am worried about coming into contact with foreigners because they might have the virus
Xenophobia	I am worried that foreigners are spreading the virus because they're not as clean as we are
Xenophobia	If I went to a restaurant that specialized in foreign foods, I'd be worried about catching the virus
Xenophobia	If I was in an elevator with a group of foreigners, I'd be worried that they're infected with the virus
Contamination	I am worried that people around me will infect me with the virus
Contamination	I am worried that if I touched something in a public space (e.g., handrail, door handle), I would catch the virus
Contamination	I am worried that if someone coughed or sneezed near me, I would catch the virus
Contamination	I am worried that I might catch the virus from handling money or using a debit machine
Contamination	I am worried about taking change in cash transactions
Contamination	I am worried that my mail has been contaminated by mail handlers

*Traumatic Stress:*

In the following statements, we refer to COVID-19 as "the virus". Please read each statement and indicate how frequently you have experienced each problem during the past seven days.

- 0 Never
- 1 Rarely
- 2 Sometimes
- 3 Often
- 4 Almost always

I had trouble sleeping because I worried about the virus

I had bad dreams about the virus

I thought about the virus when I didn't mean to

Disturbing mental images about the virus popped into my mind against my will

I had trouble concentrating because I kept thinking about the virus

Reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart

*Checking:* The following items ask about checking behaviors. During the past seven days, how much have you one the following because of concerns about COVID-19?

- 0 Never
- 1 Rarely
- 2 Sometimes
- 3 Often
- 4 Almost always

Checked social media posts concerning COVID-19

Checked YouTube videos about COVID-19

Sought reassurance from friends or family about COVID-19

Checked your own body for signs of infection (e.g., taking your temperature)

Asked health professionals (e.g., doctors or pharmacists) for advice about COVID-19

Searched the Internet for treatments for COVID-19

## Appendix B: Activity Ratings

### B1. Activity Familiarity

1. Name an activity which you found enjoyable in the past month: \_\_\_\_\_
  
2. What type of activity is your answer to question 1?
  - a. Physical (for example: exercise, weight lifting, sports)
  - b. Craft (for example: woodworking, sewing, repairing or assembling items)
  - c. Games (for example: word games, board games, puzzles, cards)
  - d. Television
  - e. Social-private (for example: talk on phone, dinner with friends)
  - f. Social-public (for example: attend a social meeting or gathering, clubs, social volunteer work)
  - g. Religious (for example: attend religious services, prayer, meditation)
  - h. Travel
  - i. Experiential (for example: read for leisure, read news, garden, write letters, knit or sew)
  - j. Developmental (take a course, watch a lecture, creative writing, study a foreign language, attend movies)
  - k. Technology Use (for example: computer use, photography, play an instrument, prepare income tax)

3. Please rate the activity you identified in item 1 on the following items, using scale from 1 to 7:

My activity is:	1- not at all	2	3	4- neutral	5	6	7- extremely
Familiar							
Routine							
Habitual							
Well-known							
Novel							
Different							
Unfamiliar							
New							
Physical							
Sedentary							
Social							
Solitary							
Meaningful							
Important							
Worthwhile							
Automatic							
Demanding							
Effortful							

A source of knowledge							
A benefit to me in the future							

4. Approximately how often do you typically participate in this activity?

- a. Daily
- b. 2 or 3 times a week
- c. About once a week
- d. 2 or 3 times a month
- e. About once a month
- f. 2 or 3 times a year
- g. About once a year
- h. Less than once per year

5. How long have you been participating in this activity?

- a. less than one month
- b. between 1-6 months
- c. 6-12 months
- d. 1-5 years
- e. more than 5 years

6. When you participate in this activity, how many others typically participate with you?

\_\_\_\_\_

## **B2. The Flow Experiences Scale (Waterman et al., 2003)**

When I engage in this activity:

- (a) I feel I have clear goals.
- (b) I feel self-conscious. (reverse-scored)
- (c) I feel in control.
- (d) I lose track of time.
- (e) I feel I know how well I am doing.
- (f) I have a high level of concentration.
- (g) I forget personal problems.
- (h) I feel fully involved.

7-point scale, ranging from 1- not at all characteristic of me to 7-very characteristic of me



### **B3. Overall Activity Level**

The 57-item, augmented Victoria Longitudinal Study Activity Lifestyle Questionnaire (VLS-ALQ; Jopp & Hertzog, 2010)

Please select the letter that MOST NEARLY describes the frequency with which you have done the activity *in the last two years*.

Answer key:

- a. Daily (8)
- b. 2 or 3 times a week (7)
- c. About once a week (6)
- d. 2 or 3 times a month (5)
- e. About once a month (4)
- f. 2 or 3 times a year (3)
- g. About once a year (2)
- h. Less than once per year (1)
- i. Never (0)

#### Physical Activities

- 1. I lift weights, strength train, or do calisthenics
- 2. I do aerobic exercise such as cardio/fitness/workout
- 3. I do flexibility exercise such as stretching/yoga/tai chi
- 4. I engage in outdoor activities such as sail/fish/backpack
- 5. I engage in exercises such as jog/swim/cycle/run
- 6. I engage in recreation sports such as tennis/golf/bowling

#### Crafts

- 7. I repair a car, lawn mower, or other machine
- 8. I do household repairs (painting, leaking gutters, etc.)
- 9. I do woodworking, carpentry, or furniture refinishing
- 10. I purchase a new item requiring set up or assembly

#### Games

- 11. I play word games such as Scrabble
- 12. I play knowledge games such as Trivial Pursuit
- 13. I play board games such as chess/checkers
- 14. I do jigsaw puzzles
- 15. I do cross-word puzzles, sudoku, or anagrams
- 16. I play card games such as bridge/whist/poker

#### Watching TV

- 17. I watch comedy or adventure programs on TV (television)
- 18. I watch game shows on TV
- 19. I watch documentary or educational programs on TV
- 20. I watch news programs on TV

#### Social-Private

- 21. I go out with friends
- 22. I visit friends, relatives, or neighbors
- 23. I attend parties

- 24. I talk to a friend on the phone
- 25. I give a dinner party for friends
- 26. I eat out at a restaurant
- 27. I engage in political activities

Social-Public

- 28. I give a public talk or lecture
- 29. I attend meetings of clubs such as hobbies/books/talks
- 30. I attend organized social events
- 31. I volunteer

Religious Activities

- 32. I attend a religious service of any faith
- 33. I engage in prayer, meditation, or philosophical thought

Travel

- 34. I travel out of town
- 35. I travel out of state
- 36. I travel abroad

Experiential Activities

- 37. I engage in business activities not related to a job such as stocks/investments
- 38. I collect stamps, coins, dolls, or other memorabilia
- 39. I read books or magazines for leisure
- 40. I read newspapers or online news
- 41. I garden indoors or outdoors
- 42. I write letters
- 43. I sew, knit, or do needlework

Developmental Activities

- 44. I read books as part of a job
- 45. I attend a public lecture
- 46. I enroll in a college or university course
- 47. I engage in creative writing
- 48. I go to the library
- 49. I study or practice a foreign language
- 50. I engage in on-the-job training
- 51. I attend movies

Technology Use

- 52. I use computer software
- 53. I use an electronic calculator
- 54. I do arithmetic or mathematical calculations
- 55. I engage in photography
- 56. I play a musical instrument
- 57. I prepare my own income tax

## Appendix C: Attention Checks

### 1. Within demographic items:

How long have you worked at your most recent job? For this item, in order to check that you are paying attention, please enter seven, regardless of your true answer to this question.

### 2. Within PWS:

For this item, in order to check that you are on task- please select “a little agree”

### 3. Within CSS:

I am worried about paying attention to this scale; in order to check that you are on task please select the answer “very”

### 4. Within VLS-ALQ:

I am paying attention to my responses; in order to check that you are on task please select answer d: 2 or 3 times a month

## Appendix D: Demographic Data, Physical Health, & Personality Traits

### D1. Demographic data:

1. What is your age? \_\_\_\_\_
2. What gender do you identify as?
  - a. Male
  - b. Female
  - c. Other: \_\_\_\_\_
  - d. Prefer not to answer
3. Please specify your ethnicity:
  - a. Caucasian/White/European American
  - b. African American
  - c. Latino(a) or Hispanic
  - d. Asian
  - e. Middle Eastern
  - f. Native American, Hawaiian or Pacific Islander
  - g. Two or more
  - h. Other/unknown
  - i. Prefer not to answer
4. What is the highest degree or level of education you have completed?
  - a. Some elementary school
  - b. Some middle school
  - c. Some high school
  - d. High School
  - e. Trade School
  - f. Bachelor's Degree
  - g. Master's Degree
  - h. Doctorate Degree
  - i. Prefer not to answer
5. What is your total household income per year?
  - a. Less than \$10,000
  - b. \$10,000 to \$19,999
  - c. \$20,000 to \$29,999
  - d. \$30,000 to \$39,999
  - e. \$40,000 to \$49,999
  - f. \$50,000 to \$59,999
  - g. \$60,000 to \$69,999
  - h. \$70,000 to \$79,999
  - i. \$80,000 to \$89,999
  - j. \$90,000 to \$99,999
  - k. \$100,000 to \$149,999
  - l. \$150,000 or more
  - m. Prefer not to answer
6. What is your marital status?
  - a. Never married
  - b. Married/Partnered
  - c. Separated
  - d. Divorced
  - e. Widowed
  - f. Other: \_\_\_\_\_
7. What best describes your current vocational status?
  - a. Employed full time
  - b. Employed part time
  - c. Unemployed- seeking work

- d. Unemployed- not seeking work
  - e. Retired
  - f. Disabled
8. In what state is your primary residence?
9. What best describes the location of your home:
- a. Large city
  - b. Suburbs of a large city
  - c. Small city
  - d. Town
  - e. Rural Area
10. Is English your first language?
- a. If no, what language did you speak first?
11. Many people feel a different age than they actually are. What age do you feel most of the time?"

**D2. General Health subscale of the RAND 36-Item Health Survey (developed by RAND as part of the Medical Outcomes Study**

Choose one option for each questionnaire item:

1. In general, would you say your health is:
- 1. Excellent
  - 2. Very good
  - 3. Good
  - 4. Fair

How True or False is **each** of the following statements for you:

- 1. Definitely True
  - 2. Mostly True
  - 3. Don't know
  - 4. Mostly false
  - 5. Definitely False
2. (item 33): I seem to get sick a little easier than other people
3. (item 34): I am as healthy as anybody I know
4. (item 35): I expect my health to get worse
- 5 (item 36): My health is excellent

Scoring:

For items 1, 34, & 36:

1= 100 2=75 3=50 4=25 5= 0

For items 33 & 35:

1=0 2=25 3=50 4=75 5=100

Take average of 5 items

**D3. The Ten-Item Personality Inventory (TIPI; Gosling et al., 2003).**

Instructions: Here are a number of personality traits that may or may not apply to you. Please select the number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

- 1 = Disagree strongly
- 2 = Disagree moderately
- 3 = Disagree a little
- 4 = Neither agree nor disagree
- 5 = Agree a little
- 6 = Agree moderately
- 7 = Agree strongly

I see myself as:

- 1. \_\_\_\_\_ Extraverted, enthusiastic.
- 2. \_\_\_\_\_ Critical, quarrelsome.
- 3. \_\_\_\_\_ Dependable, self-disciplined.
- 4. \_\_\_\_\_ Anxious, easily upset.
- 5. \_\_\_\_\_ Open to new experiences, complex.
- 6. \_\_\_\_\_ Reserved, quiet.
- 7. \_\_\_\_\_ Sympathetic, warm.
- 8. \_\_\_\_\_ Disorganized, careless.
- 9. \_\_\_\_\_ Calm, emotionally stable.
- 10. \_\_\_\_\_ Conventional, uncreative.

TIPI scale scoring (“R” denotes reverse-scored items): Extraversion: 1, 6R; Agreeableness: 2R, 7; Conscientiousness: 3, 8R; Emotional Stability: 4R, 9; Openness to Experiences: 5, 10R.

## Appendix E: Informed Consent

Informed consent will be obtained by presenting the consent form on the first page of the study website:

May 26, 2021

Dear Study Participant:

You are being invited to participate in a research study by answering questions in the attached survey about your emotional well-being and activity engagement. This study is conducted by Kelly Shryock, MA and Suzanne Meeks, PhD of the University of Louisville. There are no known risks for your participation in this research study. The information collected may not benefit you directly. The information learned in this study may be helpful to others. The information you provide will help to develop or refine interventions to increase psychological well-being. Your completed survey will be stored in a password protected file, with no identifying information. The survey will take approximately 30-40 minutes to complete. You will be compensated \$4 for a fully completed survey. You must enter your Prolific ID to begin this survey and must follow the link at the end of the survey in order to receive this compensation. Incomplete surveys or those that do not complete these steps will not be compensated.

Individuals from the University of Louisville's Department of Psychological & Brain Sciences, the Institutional Review Board (IRB), the Human Subjects Protection Program Office (HSPPO), and other regulatory agencies may inspect these records. In all other respects, however, the data will be held in confidence to the extent permitted by law. Should the data be published, your identity will not be disclosed.

Taking part in this study is voluntary. By answering survey questions you agree to take part in this research study. You do not have to answer any questions that make you uncomfortable. You may choose not to take part at all. If you decide to be in this study you may stop taking part at any time. If you decide not to be in this study or if you stop taking part at any time, you will not lose any benefits for which you may qualify.

If you have any questions, concerns, or complaints about the research study, please contact the research study Principal Investigator: Suzanne Meeks, 502-852-6068

If you have any questions about your rights as a research subject, you may call the Human Subjects Protection Program Office at (502) 852-5188. You can discuss any questions about your rights as a research subject, in private, with a member of the Institutional Review Board (IRB). You may also call this number if you have other questions about the research, and you cannot reach the research staff, or want to talk to someone else. The IRB is an independent committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has reviewed this research study.

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call 1-877-852-1167. This is a 24 hour hot line answered by people who do not work at the University of Louisville.

Sincerely,

**Kelly Shryock, MA**

**Suzanne Meeks, PhD**

## Appendix F: Exploratory Hypothesis Descriptive Statistics and Pearson Correlations

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Familiarity	200	37.34	5.02	-							
2. Chronological Age	100	47.57	15.69	.17*	-						
3. Subjective Age	200	38.90	14.72	.17*	.68**	-					
4. Hedonic Well-being	194	46.74	25.86	.05	<.01	-.09	-				
5. Eudaimonic Well-being	200	212.49	37.02	.05	.13	-.01	.79**	-			
6. Physical Health	200	64.25	22.35	.03	-.21**	-.31**	.57**	.48**	-		
7. Extraversion	200	6.95	3.29	-.16*	.09	<.01	.31**	.45**	.14*	-	
8. Openness to Experience	200	10.49	2.79	-.08	<-.01	-.14	.26**	.46**	.36**	.39**	-

\* $p < .05$ . \*\* $p < .01$ .



## CURRICULUM VITAE

Sarah “Kelly” Shryock

2409 Birch Avenue  
Steilacoom, WA 98388  
502.321.9329  
Kelly.Shryock@gmail.com

---

### EDUCATION

- 2022 (expected)                      Ph.D., Clinical Psychology  
University of Louisville, Louisville, KY  
Dissertation Title: *Age-related differences in the relationship between activity familiarity and well-being*
- 2007                                      M.A. in Community Counseling  
University of Northern Colorado, Greeley, CO
- 2004                                      B.A. in Studio Art, minor in Psychology  
Centre College, Danville, KY

### INTERNSHIP AND POST-DOCTORAL EXPERIENCE

Post-doctoral Fellowship, Clinical Geropsychology: September 2022 - August 2023

VA Puget Sound Health Care System, American Lake Division: Tacoma, WA

Interdisciplinary training opportunities are focused within the Geriatrics & Extended Care, Primary Care Mental Health Integration, and Geriatric Research, Education, and Clinical Centers service lines and meet requirements for board certification, as specified by the American Board of Geropsychology. Primary responsibilities include direct patient care, consultation, staff and trainee education, provision of tiered supervision to psychology intern, and program development. Quality improvement projects include examination of a group intervention targeting healthy brain aging strategies for older adults and adaptation of this group for use in long-term care settings.

Pre-doctoral Internship, Clinical Psychology: July 2021 - July 2022

VA Puget Sound Health Care System, American Lake Division: Tacoma, WA

*Mental Health Clinic, Neuropsychology*

Conducted neuropsychological assessments, including chart review, interview, testing, scoring, report write-up, and feedback, with an additional focus on cultural competence in assessment.

*Clinical Geropsychology (Geriatrics and Extended Care, Primary Care Mental Health Integration)*

Worked with older adults in interdisciplinary primary care and long-term care settings, consistent with the standards in the Pikes Peak Competencies for geropsychology training. Individual emphases on mental health triage evaluations, brief assessment and treatment, and cognitive screening.

*Pain Clinic*

Experience working within a biopsychosocial, interdisciplinary team approach to chronic pain in a Commission on Accreditation of Rehabilitation Facilities (CARF) accredited program. Supervised experience providing Cognitive Behavioral Therapy for Insomnia, Cognitive Behavior Therapy for Chronic Pain, Acceptance and Commitment Therapy, Self-Hypnosis, and Relaxation training. Also co-facilitated groups within the intensive Outpatient Functional Restoration Pain Program (OFRP), which teaches Veterans psychological, physical, mind-body and neuroplasticity approaches to chronic pain self-management with the goal of a return to a more active, productive, enjoyable, and independent life.

*Psychodiagnostic Assessment*

Full-year training experience focused on psychodiagnostic assessment of veterans with complex mental health concerns, including in-person and video-based telehealth.

**PRE-DOCTORAL CLINICAL EXPERIENCE:**

Clinical Psychology Practicum Training: 2017-2021

University of Louisville: Louisville, KY

*Adult Assessment Practicum*, Private Practice: 2020-2021

Utilized a standardized battery of psychological assessments for outpatient clients, including measures of cognition, memory, executive function, personality, parenting, and psychosocial and emotional functioning. Completed structured interview, testing, scoring, report write-up and provided preliminary feedback.

*Integrative Intervention Practicum*, Noble H. Kelley Psychological Services Center: 2019-20 & 2017-18

Conducted individual therapy for outpatient clients from an integrative perspective and peer supervision for team members. Transitioned to telehealth sessions (telephone and video) in March 2020. Additional focus on use of the DSM-5 Cultural Formulation Interview.

*Assessment Practicum*, Noble H. Kelley Psychological Services Center: 2018-2020

Administered semi-structured assessment interviews and flexible batteries of neuropsychological assessments for adult and child outpatients to address a range of referral questions, including ADHD, learning disorders, memory concerns, and autism spectrum diagnoses. Scored tests and wrote reports based on clients' performance; provided feedback.

*Cognitive Behavioral Therapy Practicum*, Noble H. Kelley Psychological Services Center: 2018-2019

Provided individual therapy for outpatient clients based on cognitive behavioral therapy theory, including Cognitive Processing Therapy and DBT skills training, and peer supervision for team members.

*Geriatric Neuropsychological Assessment Practicum*, University of Louisville Outpatient Center: 2018

Employed semi-structured assessment interviews and standardized batteries of neuropsychological assessments with outpatient older adults and collateral informants. Scored tests and wrote reports based on patients' performance.

*Geriatric Clinical Psychology Practicum*, Kindred Transitional Care and Rehabilitation: 2017-2018

Provided individual therapy and psychological assessment for residents in a long-term care and short-term rehabilitation center. Consulted with facility staff and family members as appropriate, including to encourage behavioral activation for residents with depression.

Disability Rights Advocate: 2014-2015

Kentucky Protection and Advocacy: Frankfort, KY

Carried out individual, client-directed, legal advocacy for individuals with disabilities across Kentucky. Worked with systems, institutions, and care providers to communicate the needs of clients on an individual and policy level. Performed monitoring at facilities including psychiatric hospitals, intermediate care facilities for individuals with intellectual disabilities, nursing facilities, personal care homes, prisons, and community agencies. Developed and conducted specialized trainings related to self-advocacy, individual rights, voting, and vocational opportunities for individuals with cognitive, physical, and psychiatric disabilities.

Disability Adjudicator: 2012-2014

Disability Determination Services, Kentucky Cabinet for Health and Family Services: Frankfort, KY

Examined medical, psychiatric, and vocational records to determine eligibility for Social Security disability benefits under state and federal regulations. Consulted with medical specialists for complex decisions and prepared personalized explanations for denied claims.

Educational Specialist: 2008-2011

Center for Academic Achievement, University of Massachusetts Medical School: Worcester, MA

Provided individualized consultations to medical students, residents, graduate nursing students, and doctoral students in the biomedical sciences to pinpoint academic strengths and weaknesses and to provide recommendations for evidence-based strategies, learning materials, and alternate resources to enhance academic skills. Taught study skills seminars for medical students. Created and implemented workshops to address evidence-based study skills, test taking, board/in-service examination preparation, tutor training, and time management.

Psychotherapist (Master's level counselor): 2007-2008

Rocky Mountain Healthcare Services/Brain Injury Services: Colorado Springs, CO

Worked with clients recovering from brain injuries at the Day Clinic and two residential rehabilitation facilities to provide individual/group psychotherapy and case management services. Completed psychosocial assessments, treatment plans, monthly progress toward goals summaries, utilization reviews, and documentation of services provided.

## **RESEARCH EXPERIENCE**

### Clinical Psychology Internship Research Project: 2021-2022

Geriatric Research Education and Clinical Center (GRECC), VA Puget Sound Health Care System

Principal Researcher: Emily Trittschuh, Ph.D.

#### *Healthy Aging Project- Brain (HAP-B) Group: Quality Assurance and Dissemination*

Ongoing quality assurance project, examining the Health Aging Project-Brain (HAP-B), a psychoeducational and motivational group for older veterans.

- Co-facilitated a virtual HAP-B group
- Responsible for data entry and data analysis of study data (n=61)
- Developed an adaptation of the group for use in long-term care settings

### Graduate Research Assistant: 2017-2021 and Laboratory Manager: 2015-2016

Aging & Mental Health Lab, University of Louisville Department of Psychological & Brain Sciences

Principal Researcher: Suzanne Meeks, Ph.D.

#### *Age-related Differences in the Relationship between Activity Familiarity and Well-being*

Cross-sectional study of the relationships among age, activity familiarity, and well-being, utilizing a correlational, online study design (n=200).

- Doctoral dissertation research study

#### *Individual Differences in End-of-Life Care Preferences, Experiences of Care, and Quality of Life*

Correlational study, examining long-term care experiences from the patient's point of view, including measures of preferences and expectations for end-of-life care through face-to-face interviews (n=70).

- Completed literature searches and identified measures for study inclusion
- Supervised and trained undergraduate research assistants in data collection, entry, and analysis
- Collected data through participant interviews, completed ongoing IRB documentation, and maintained study database

#### *Psychological Aspects of Theatre Audience Engagement: Generational Differences and Lessons from Older Subscribers on Audience Engagement Related to Psychological Flourishing.*

Funding: National Endowment for the Arts and the University of Louisville.

A three-part, mixed methods study (online survey of ticket purchasers, n=676; focus groups, n=20; longitudinal post-performance surveys, n=62) of performing arts engagement, focusing on the psychological benefits of sustained engagement.

- Responsible for participant recruitment and retention, obtained informed consent, maintained study contacts, and submitted ongoing IRB documentation

- Served as point of contact for longitudinal study participants and managed online survey through Qualtrics
- Completed literature searches and downloaded, cleaned, analyzed, and summarized quantitative data
- Coded focus group transcripts to extract *a priori* themes and completed written summary of focus group qualitative data

*Predicting Trajectories of Flourishing and Failing in New Nursing Home Residents.*

Funding: NIMH.

Observational study, followed newly admitted residents (n=74) for 6 months to identify resilience resources which predict adjustment and well-being over time.

- Responsible for participant recruitment, obtained informed consent, scheduled data collection, maintained study contacts, and submitted continuing IRB documentation
- Entered and managed study data
- Maintained storage and documentation of study plasma samples

*Community Nursing Home as a Clinical Training and Consultation Laboratory for Studying Behavioral Interventions.*

Explored the effectiveness and sustainability of the Music & Memory<sup>SM</sup> intervention for residents residing in a memory care unit at a local nursing facility (n=5).

- Developed and maintained study contacts, scheduled interventions, and managed study equipment
- Supervised and trained undergraduate research assistants in data collection, entry, and analysis
- Completed scheduled interventions, collected study data, and completed ongoing IRB documentation
- Summarized and documented study protocol and revised tools for data collection and analysis

*BE-ACTIV! Treating Depression in Nursing Homes.* Funding: NIMH.

Randomized, controlled, two-group study of the efficacy of a behavioral intervention for depression designed to increase opportunities for pleasant events (n=82).

- Completed literature searches, cleaned, analyzed, and summarized quantitative data.

*Mental Health Providers' Knowledge of and Interest in Evidence-based Practices in Nursing Homes*

Online survey of mental health providers practicing in nursing homes (n=76), exploring relevance, competency, and interest in further training in psychosocial treatment areas.

- Assisted with participant recruitment, set up survey via Qualtrics, and completed literature searches

Educational Specialist: 2008-2011

Center for Academic Achievement, University of Massachusetts Medical School

Principal Researcher: Lorrie Gehlbach, Ph.D.

Pilot study: *Using Technology to Improve Reading Fluency in Post-Secondary Students with Low Reading Frequency*.

Examined the benefits of a computerized reading program (n=12) designed to improve reading rate through exposure to written and recorded text presented at gradually increased speed.

- Assisted with study design, data collection, and co-authored study poster presentation

## **PUBLICATIONS**

**Shryock, S.K.** & Meeks, S. (2020). Activity, activity personalization, and well-being in nursing home residents with and without cognitive impairment: An integrative review. *Clinical Gerontologist*. Advanced online publication. <https://doi.org/10.1080/07317115.2020.1844356>

Meeks, S., Vandenbroucke, R.J., & **Shryock, S.K.** (2020). Psychological benefits of attending the theatre associated with positive affect and well-being for subscribers over age 60. *Aging & Mental Health*. 24(2). 333-340. <https://doi.org/10.1080/13607863.2018.1534082>

Meeks, S., **Shryock, S.K.**, & Van Haitsma, K. (2019). Treatment fidelity evidence for BE-ACTIV – a behavioral intervention for depression in nursing homes. *Aging & Mental Health*, 23(9). 1192-1202. <https://doi.org/10.1080/13607863.2018.1484888>

Meeks, S., **Shryock, S.K.**, & Vandenbroucke, R.J. (2018). Theatre involvement and well-being, age differences, and lessons from long-time subscribers. *The Gerontologist*, 58(2). 278-289. <https://doi.org/10.1093/geront/gnx029>

### ***In progress***

**Shryock, S.K.** & Meeks, S. Reliability, factorial validity, and age x sex patterns in the 42-item Ryff Psychological Well-being Scales. *Manuscript in preparation for submission*.

### ***Non-refereed Papers and Reports***

Meeks, S., Vandenbroucke, R.J., & **Shryock, S.K.** (2018). Final report: Psychological aspects of theatre audience engagement: Generational differences and lessons from older subscribers on audience engagement related to psychological flourishing. NEA Art Works Grant # 15-3800-7007

## **PROFESSIONAL PRESENTATIONS**

**Shryock, S.K.**, Verstaen, A., Hirschhorn, E., & Trittschuh, E.H. (2022, August). *Keep your brain HAP-B: Group psychoeducation to promote behaviors which support healthy brain aging*. Poster presentation at the Alzheimer's Association International Conference, San Diego, CA.

**Shryock, S.K.** (2021, March). *Age-related differences in the relationship between activity familiarity and well-being*. Oral presentation at the Kentucky Graduate Student Regional Research Conference, Online.

- Shryock, S.K.** & Meeks, S. (2020, November). *Sense of belonging, religious activity, and well-being in long-term care residents*. Poster session at the Gerontological Society of America Conference, Online. <https://doi.org/10.1093/geroni/igaa057.1241>
- Shryock, S.K.** & Meeks, S. (2019, November). *End of life care preferences and well-being in long term care residents*. Poster session at the Gerontological Society of American Conference, Austin, TX. <https://doi.org/10.1093/geroni/igz038.2474>
- Shryock, S.K.** & Meeks, S. (2018, November). *Internal consistency and factorial validity of the 42-item psychological well-being scales*. Poster session at the Gerontological Society of American Conference, Boston, MA. <https://doi.org/10.1093/geroni/igy023.2568>
- Meeks, S., **Shryock, S.K.**, & Vandembroucke, R.J. (2018, November). *Theatre audience members' positive affect, belonging, social interaction, and flow related to 2-year well-being*. Poster session at the Gerontological Society of American Conference, Boston, MA. <https://doi.org/10.1093/geroni/igy023.450>
- Shryock, S.K.** & Meeks, S. (2017, July). *Social relationships among adult theater audience members*. Poster session at the International Association for Gerontology and Geriatrics, San Francisco, CA. <https://doi.org/10.1093/geroni/igx004.4298>
- Meeks, S., **Shryock, S.K.**, & Van Haitsma, K. (2017, July). *Implementing evidence-based depression care in nursing homes: A treatment fidelity study*. Poster session at the International Association for Gerontology and Geriatrics, San Francisco, CA. <https://doi.org/10.1093/geroni/igx004.674>
- Shryock, S.K.** & Meeks, S. (2016, November). *Flow and well-being in theatre patrons across age groups*. Poster session at the Gerontological Society of America Conference, New Orleans, LA. <https://doi.org/10.1093/geront/gnw162.2260>
- Smith, R. Andrew, N., Reyes, R., **Shryock, S.K.**, Hodges, L., Hart, A., Davis, H., & Meeks, S. (2016, November). *Individualized music therapy for affect, agitation, and engagement in older women with dementia*. Poster session at the Gerontological Society of America Conference, New Orleans, LA. <https://doi.org/10.1093/geront/gnw162.1333>
- Gehlbach, L.N. & **Shryock, S.K.** (2009, November). *Using technology to improve reading fluency in high-achieving post-secondary students with low reading frequency: Pilot case study data*. Poster session at the Learning and the Brain Conference, Cambridge, MA.

## **DIDACTICS & COMMUNITY PRESENTATIONS**

- |         |   |
|---------|---|
| 1/2022  | American Lake VA Geriatric Service Line Journal Club: Psychosis in Older Adults                         |
| 12/2021 | Social Work Trainee Didactic Series: Geriatric Mental Health-A Broad Overview                           |
| 12/2021 | American Lake VA Interdisciplinary Geriatric Training Group: Flourishing & Resilience                   |
| 11/2019 | Graduate Student Clinical Discussion Panel: Psychotherapy with Clients with Comorbid Medical Conditions |
| 3/2019  | Graduate Student Clinical Discussion Panel: Comorbid Substance Abuse                                    |

## **TEACHING EXPERIENCE**

### Instructor:

University of Louisville, Department of Psychological & Brain Sciences  
*Statistics Labs:* Spring 2020, Spring 2021

### Graduate Teaching Assistant:

University of Louisville, Department of Psychological & Brain Sciences  
*Research Methods in Psychology:* Fall 2020  
*Abnormal Psychology:* Spring 2019, Fall 2019  
*Personality Psychology:* Spring 2019  
*Tests and Measurement:* Fall 2017, Fall 2018

## **GRANTS**

Project Title: *Age-related Differences in the Relationship between Activity Novelty/Familiarity and Well-being.*

- University of Louisville Graduate Student Council Research Grant: 2020  
Award amount: \$500
- University of Louisville Graduate Network Arts & Sciences Research Grant: 2020  
Award amount: \$250.

## **HONORS AND AWARDS**

*Travel Award:* University of Louisville, Graduate School Council, 2018 and 2020

*Most Excellent in Research, Student Award:* University of Louisville, Department of Psychological & Brain Sciences, 2018

*Student Travel Award:* Gerontological Society of America, Behavioral and Social Sciences, 2016

*Psi Chi Inductee-* International Honor Society in Psychology, 2003

## **SERVICE ACTIVITIES**

Training Committee Member: 2021-2022, VA Puget Sound Health Care System, American Lake Division

Clinical Psychology 4<sup>th</sup> Year Cohort Liaison: 2020-2021, University of Louisville

Ad Hoc Reviewer: 2020, Clinical Gerontologist

Clinical Psychology Student Representative: 2018-2020, University of Louisville

## **PROFESSIONAL AFFILIATIONS**

*Gerontological Society of America*, Student Member: 2016-present

*American Psychological Association*, Graduate Student Affiliate, 2017-present



Division 12, Section 2: Clinical Geropsychology

Division 12, Section 10: Graduate Students & Early Career Psychologists

*Psychologists in Long-Term Care*, Student Member: 2020-present

*Kentucky Psychological Association*, Graduate Student Member: 2015-2021