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Does Engagement in Pleasant Events Mediate the Relation Between Physical Disability
and Affective Outcomes in Older Adults?

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Dissertation submitted
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ABSTRACT

Does Engagement in Pleasant Events Mediate the Relation Between Physical Disability
and Affective Outcomes in Older Adults?

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The current study examined potential mediators of the association between physical disability and depressive symptoms, along with positive mental health variables, including meaning in life and positive affect, within the framework of an empirically supported model of depression—the behavioral model of depression (Lewinsohn, 1985). The behavioral model of depression posits that reduced contact with positive reinforcement in the environment (i.e., engagement in pleasant events) precipitates and maintains depressive symptoms (Lewinsohn et al., 1985). Treatment studies have demonstrated the efficacy of interventions based on the behavioral model of depression in older adults (Cuijpers et al., 2007; Dimidjian et al., 2006; Hopko et al., 2003). The application of the behavioral model of depression to understanding the link between physical disability and depressive symptoms fits well with previous conceptualizations specifying the ways in which disability may affect mood (Bruce, 2001). First, consistent with role of life events in the behavioral model of depression (Lewinsohn et al., 1985), onset of disability can function as a discrete life event with the potential to create initial dysregulation in mood and disruption in schedules of reinforcement (Bruce, 2001; Dunne et al., 2011; Heckhausen et al., 2010), conditions that serve as catalysts for reduction in positive reinforcement over time (Lewinsohn, 1985). Second, physical disability is often chronic in nature and requires goal-adjustment and various forms of coping for successful adaption over time (Boerner, 2004; Hall et al., 2010). Failure to successfully adjust goals and coping strategies in response to physical disability may lead to reduced positive reinforcement if older adults do not replace lost activities with new ones, thereby increasing risk for depression over time (Duke et al., 2002). The current study was designed to examine whether the frequency of pleasant events, as well as frequency by pleasantness of events product (i.e., frequency of pleasant events and frequency x pleasantness of events), mediated the association between physical disability and affective outcomes (depressive symptoms, positive affect, meaning in life), after controlling potential confounds (age, gender, education, cognitive functioning, and perceived social support; Blazer, 2003). Participants were (N = 82) adults 65 years and older recruited from Morgantown, WV and surrounding towns/cities, Mage = 77.6 (SD = 8.0), 64.6% female, 97.6% White. Questionnaires measured physical disability (ADLS/IADLS), affective outcomes (GDS, GSIS-MIL, PANAS-PA), pleasant events (OPPES), and covariates (MoCA, DSSI, demographics). Simple mediation analyses with each proposed mediator (frequency of pleasant events and frequency x pleasantness of events) predicting affective outcomes were conducted using Preacher and Hayes' (2008) bootstrapping macro in SPSS. Consistent with predictions, frequency of pleasant events mediated the association between physical disability and affective outcomes, including depressive symptoms (unstandardized coefficient = 0.16, 95% bias-corrected CI [0.03, 0.41]), meaning in life (unstandardized coefficient = -1.58, 95% bias-corrected CI [-3.19,

-0.47]), and positive affect (unstandardized coefficient = -2.65, 95% bias-corrected CI - 5.38, -0.88]). The frequency by pleasantness of events product mediated the association between physical disability and affective outcomes (depressive symptoms: unstandardized coefficient = 0.11, 95% bias-corrected CI [0.01, 0.35]; meaning in life: unstandardized coefficient = -1.10, 95% bias-corrected CI [-2.59, -0.13]; positive affect: unstandardized coefficient = -1.89, 95% bias-corrected CI -4.38, -0.26). Mediation effects remained after controlling for covariates. Post hoc analyses revealed that after controlling for frequency of pleasant events, there was no longer significant indirect effect of pleasantness ratings, suggesting that frequency of pleasant events is most impactful in accounting for the association between physical disability and affective outcomes. Results are consistent with the behavioral mode of depression and generate ideas for future research, including prospective study designs, inclusion of daily diaries to capture real-time activity and mood, and inclusion of variables that may account for additional variance in the association between physical disability and affective outcomes in multiple mediation models, such the role of avoidance. Major depressive disorder (MDD) is a mental health condition characterized by the presence of depressed mood and/or anhedonia most of the day, nearly every day for two weeks, along with a minimum of five of nine additional symptoms (e.g., loss of energy, feelings of worthlessness or guilt; American Psychiatric Association, 2013). By the year 2020, MDD is expected to be the second leading cause of disease burden worldwide surpassing the disease burden attributed to road-traffic accidents and cardiovascular disease (Murray & Lopez, 1997). MDD is associated with increased all-cause and disease-related mortality (Köhler et al., 2013; Meijer et al., 2011; Park, Katon, & Wolf, 2013; Pinquart & Duberstein, 2010; Zheng et al., 1997). In addition, MDD is one of the strongest predictors of suicide across the life span (Brown, Beck, Steer, & Grisham, 2000; Conwell, Duberstein, & Caine, 2002). The economic consequences of MDD in the U.S. are staggering. In 2000, the cost of MDD, including direct treatment costs, morbidity, and mortality, was $81.1 billion (Greenberg et al., 2000). Reducing prevalence rates of MDD through interventions is a public health imperative that first begins with identifying the groups that are vulnerable to depressive symptoms.

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Introduction

Depressive symptoms are often used as the outcome in research and within clinical practice to provide an index of severity of symptomatology. Depressive symptoms are important to study, especially in older adults, because of age-related decline in the reporting of depressed affect (Gallo & Rabins, 1999), a hallmark symptom of MDD. Among older adults, subthreshold depression[1] and clinically significant levels of depressive symptoms (i.e., symptoms reaching an established clinical cut-off) have been found to be associated with several negative physical health outcomes (e.g., Meeks, Vahia, Lavretsky, Kulkarni, & Jeste, 2011).

Older adults are vulnerable to the experience of depressive symptoms given that cognitive and functional impairment, known risk factors for depression, increase with age (Beekman et al., 1995; Butters et al., 2008). In addition, the population of adults 65 years of age and older is rising rapidly, which will result in greater numbers of older adults affected by depressive symptoms (Administration on Aging, 2012; Jeste et al., 1999). Among older adults, those with physical disability have two times the relative risk of major depression compared to older adults without physical disability (Beekman et al., 1995). Moreover, the relative risk associated with physical disability is even greater for minor depression; older adults with physical disability have four times the relative risk of minor depression compared to their non-depressed counterparts (Beekman et al., 1995). However, factors explaining the association between physical disability and depressive symptoms in older adults remain poorly understood. The current study will examine possible mediators of the disability-depression symptoms relation in late life.

Depression in Late Life

Prevalence rates of MDD are lower in late life compared to mid-life and range from 1-4% in community-dwelling older adults (Blazer, 2003; Djernes, 2006; Fiske, Wetherell, Gatz, 2009). However, rates of MDD increase in certain subsets of older adults, including medical inpatients (e.g., 11.5%; Koenig, Meador, Cohen, & Blazer, 1988), primary care patients (e.g., 5-10%; Lyness, Caine, King, Duberstein, & Cox, 2002; Schulberg et al., 1998) and long-term care residents (e.g., 12.4%; Parmelee, Katz, & Lawton, 1989). The detection and treatment of depression is critical in older adults, because depression is an independent risk factor for increased medical burden (Alexopoulos et al., 2002; Luber et al., 2001), greater likelihood of death from natural causes (Bruce & Leaf, 1989; Penninx et al., 1999, 2001), and death by suicide (Conwell et al., 2002).

Minor and subthreshold depression, characterized by less severe and frequent symptoms of depression, are much more prevalent in older adults (Djernes, 2006). Moreover, rates of clinically significant depressive symptoms are higher in older adulthood compared to midlife (Fiske et al., 2009). A recent review of studies examining the prevalence and consequences of subthreshold depression in late life found that subthreshold depression occurs in 10% of community-dwelling older adults (Meeks et al., 2011). Prevalence rates increase substantially in medical inpatients and long-term care settings, with prevalence rates of approximately 30% and 45-50%, respectively (Meeks et al., 2011). Subthreshold depressive symptoms have been found to be associated with similar negative consequences as MDD, including greater functional impairment, medical

burden, and greater suicide ideation (Meeks et al., 2011). Further, subthreshold depression increases risk for major depression (Meeks et al., 2011); thus, intervening before depressive symptoms are severe is essential for reducing the negative impact of depression in late life.

Physical Disability and Depressive Symptoms in Late Life

One key risk factor for depression in late life is physical disability (Beekman et al., 1995; Bruce, 2001; Cole & Dendukuri, 2003; Prince, Harwood, Thomas, & Mann, 1998; Zeiss, Lewinsohn, Rohde, & Seeley, 1996). Physical disability, as defined by The International Classification of Functioning, Disability and Health (ICF), includes impairments, activity limitations, and participation restrictions (World Health Organization, 2001). Greater physical disability is associated with greater levels of depressive symptoms cross-sectionally in older adults (Bruce, 2001). Greater disability has been found to be associated with greater depressive symptoms over time, after controlling for baseline disability and depressive symptoms, as well as possible confounds, or alternative variables that could explain the relation (e.g., demographics; Antsey, von Sanden, Sargent-Cox, Luszcz, 2007; Kennedy, Kelman, & Thomas, 1990; Ormel et al., 2002). Moreover, physical disability has been found to mediate the relation between physical illness and depressive symptoms in older adults (Williamson & Schulz, 1992).

Physical disability in late life is often conceptualized as a chronic life stressor, which has many potential pathways leading to depressive symptoms (Bruce, 2001; Williamson & Shaffer, 2000). For example, physical disability reduces participation in valued activities, which may precipitate depressive symptoms (Ormel et al., 2002).

Physical disability may also result in lowered appraisal of social support, a robust predictor of depression in late life (Lin & Wu, 2011; Newsom & Schulz, 1999; Ormel et al., 2002; Taylor & Lynch, 2004; Yang, 2006). Physical disability may function as a discrete life event in its own right that requires goal-adjustment; difficulty adjusting to limitations in independence may lead to repeated failure experiences, because of an inability to obtain desired goals (Bruce, 2001; Dunne, Wrosch, & Miller, 2011; Heckhausen, Wrosch, & Schulz, 2010). In turn, repeated failure experiences may foster feelings of hopelessness and poor self-esteem, which could also lead to depressive symptoms (Bruce, 2001; Yang, 2006).

        To date, only four studies have examined mediators of the relation between physical disability and depressive symptoms in older adults. Of the four studies, all examined social support variables (Lin & Wu, 2011; Newsom & Schulz, 1999; Taylor & Lynch, 2004; Yang, 2006). Results from two of the four studies suggest that perceived social support accounted for the relation between disability and depressive symptoms (Taylor & Lynch, 2004; Yang, 2006). However, both of these studies came from the same parent study, limiting generalization to different older adults samples. In addition, Newsom & Schulz (1999) failed to find a mediation effect of appraisal support, a similar construct to perceived support, rather, they found that tangible support partially mediated the disability-depression symptom relation in older adults. Lin and Wu (2011) examined whether receipt of informal care mediated the disability-depression relation over time. They found that within the first three-year cycle (years 1-2-3), disability was associated with greater receipt of care, which in turn, increased symptoms of depression. Yang (2006), in addition to examining social support factors, also examined whether self-

esteem and sense of control served as mediators of the disability-depression symptoms relation. Both self-esteem and sense of control mediated the disability-depression relation over time.

These findings provide important areas for future research, but the mixed findings limits the ability to compare findings across studies. Given the association between disability and depressive symptoms in late life, additional research is needed testing mediators of the disability-depression relation. Moreover, few research studies examining mediators of the disability-depression symptoms relation have been guided by any contemporary models of depression. Understanding the etiology of depression is needed to better elucidate factors accounting for the association between disability and depressive symptoms in late life. The current study is guided by the behavioral model of depression and is designed to test a new mediator of the disability-depression relation in late life—engagement in pleasant events. In the current study, pleasant events are defined as an empirically-based list of activities (Teri & Lewinsohn, 1982), which are thought to increase contact with positive reinforcement (Manos, Kanter, & Busch, 2010).

Behavioral Model of Depression

Behavioral models of depression were first proposed by Ferster (1966) and Lewinsohn (1974) and held as a central tenant a causal link between reduced positive reinforcement in the environment and depressed mood. Specifically, Lewinsohn (1974) posited that depressed mood results from a low rate of positive reinforcement and exposure to aversive events. Ability to make contact with potentially reinforcing experiences is proposed to be dependent on several factors, including an individual's skill level (e.g., social skills), the number of potentially reinforcing events (e.g., individual's

perception of pleasantness), and the availability of potentially reinforcing events (Dimidjian, Barrera, Martell, Munoz, & Lewinsohn, 2011; Lewinsohn, 1974; Lewinsohn, Hoberman, Teri, & Hautziner, 1985).

While reduced rate of positive reinforcement was central to Ferster's behavioral model of depression, he also emphasized the role of negative reinforcement in the etiology and maintenance of depression (Ferster, 1966, 1973). In particular, Ferster (1973) discussed the high rate of escape and avoidance behaviors among individuals with depression, in an attempt to relieve internal or external sources of aversive stimuli. Ferster (1973) posited that negative reinforcement is deleterious because it does not successfully eliminate distress over the long-term and causes reduction in positive reinforcement.

In 1985, Lewinsohn and colleagues refined the behavioral model of depression to include the role of negative expectancies (e.g., cognitions). The revised model posited that among a group of vulnerable individuals, stressful life events (e.g., death of a loved one) disrupts exposure to positively reinforcing events and increases the frequency of aversive events. Reduced exposure to positively reinforcing events and increased aversive events leads to heightened self-awareness, in particular, more self-critical thoughts. The combination of reduced contact with positively reinforcing events and increased contact with aversive or punishing events, along with heightened negative self-awareness, perpetuates depressed mood (Lewinsohn et al., 1985).

Several components of the behavioral model of depression have been empirically supported (Hopko, Armento, Cantu, Chambers, & Lejuez, 2003; Hopko & Mullane, 2008; Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1972; MacPhillamy & Lewinsohn,

1974). For example, past research suggests that compared to individuals without

depression, individuals with mild-to-moderate depressive symptoms report a lower

number of daily pleasant events (Hopko et al., 2003; Lewinsohn & Graf, 1973;

Lewinsohn & Libet, 1972; MacPhillamy & Lewinsohn, 1974). Additionally, research

suggests that not only do individuals with depressive symptoms report fewer daily

pleasant events, but also reduced enjoyability of pleasant events (Hopko et al., 2003;

MacPhillamy & Lewinsohn, 1974). Further, a large body of research supports the relation

between negative cognitions and depressed mood cross-setionally and longitudinally

(Alloy et al., 2006; Hankin et al., 2009; Hilsman & Garber, 1995; Persons, Jacqueline, &

Rao, 1985).

Based on the behavioral model of depression, behavior therapy for depression was

developed (Hopko, Lejuez, LePage, Hopko, & McNeil, 2003; Truax et al., 1996; Lejuez,

Hopko, & Hopko, 2001; Lewinsohn, Muñoz, Youngren, & Zeiss, 1986; Martell, Addis,

& Jacobson, 2001; Zeiss, Lewinsohn, & Muñoz, 1979) and provides the greatest evidence

for the model (Cuijpers, van Straten, & Warmerdam, 2007; Dimidjian et al., 2006;

Hopko, Lejuez, Ruggiero, & Eifert, 2003). Behavior therapy is designed to increase an

individual's exposure to pleasant events, decrease the frequency of aversive events, and

foster the skills necessary to maintain engaging in pleasant events (Dimidjian et al.,

2011). The efficacy of behavior therapy for the treatment of depression has been well

established in older adults (Scogin, Welsh, Hanson, Stump, & Coates, 2005).

The behavioral model of depression was selected to inform potential mediators in

the current study based largely on evidence from treatment studies, in which behavior

therapy, a treatment for depression directly stemming from the behavioral model of

depression (Jacobson, Martell, & Dimidjian, 2001), produced similar treatment effects

compared to a full course of cognitive therapy (Dimidjian et al., 2006; Gortner, Gollan,

Dobson, & Jacobson, 1998; Truax et al., 1996). The results of the component analysis

indicated that additional cognitive components of treatment are not needed to produce

significant reductions in depressive symptoms. Additionally, the behavioral model of

depression was selected because it corresponds with conceptualizations describing the

relation between disability and depressive symptoms through restriction of leisure and

social activities (Ormel et al., 2002).

Disability in the Behavioral Model of Depression

Ferster (1966) highlighted aging as critical transition period in life "when new

performances under the control of new reinforcers must emerge (pp. 350)." Disability is

associated with reduced participation in leisure and social activities in older adults

(Zautra, Reich, & Guarnaccia, 1990; Zimmer, Hickey, & Searle, 1995, 1997). Among a

sample of older adults with arthritis, disability (e.g., ADLs) distinguished those

individuals who discontinued leisure activities compared to individuals who continued

leisure activities (Zimmer et al., 1997). Moreover, arthritis severity in older adults was

found to be associated with lower frequency of pleasant events, which was associated

with lower psychological well-being (Zimmer et al., 1995). Research suggests that older

adults with recent disability compared to older adults who were recently bereaved

experienced more frequent daily undesirable events (e.g., Had to stop a hobby, sport, or

recreational activity) and fewer daily desirable events (e.g., Went to a club or organized

group meeting), as coded as desirable or undesirable by ten experts in life events

research, further pointing to the influence of disability on the frequency of daily events

(Zautra, Reich, & Guarnaccia, 1990). Additionally, past research suggests that frequency

of pleasant events is associated with affective outcomes in older adults, including

psychological well-being (Duke, Leventhal, Brownlee, & Leventhal, 2002; Warr,

Butcher, & Robertson, 2004) and positive and negative affect (Mausbach, Coon,

Patterson, & Grant, 2008). Warr and colleagues (2004) examined the relation between

frequency of pleasant events and affective outcomes (i.e., psychological outcomes

typically mood or emotion-based) in adults 50-74 years of age. They found that

participation in pleasant events, especially family and social activities and church and

charity activities, was associated with greater affective well-being and life satisfaction,

after controlling for demographics (e.g., age, gender, married, socioeconomic status

(SES)) and health variables. Similarly, longitudinal research with older adults with

chronic illness demonstrated that giving up activities, but replacing them with alternative

ones, was associated with increased psychological well-being over time (Duke et al.,

2002). Research with caregivers of individuals with Alzheimer's disease demonstrated

that the frequency of pleasant events, as well as the frequency by pleasantness of events

product, was associated with same-day levels of positive and negative affect (Mausbach

et al., 2008). Lastly, among nursing home residents, large, negative correlations were

found between the frequency of pleasant events, as well as the frequency by pleasantness

of events product and depressive symptoms. In addition, large, positive correlations were

found between the frequency of pleasant events, as well as the frequency by pleasantness

of events product and positive affect (Meeks, Shah, & Ramsey, 2009). These studies

suggest that disability is associated with frequency of pleasant events and further, that

frequency of pleasant events is associated with affective outcomes. Only one study, thus

far, has examined whether the association between physical disability and affective

outcomes is mediated by frequency of daily events (Zautra et al., 1990).

Zautra and colleagues (1990) examined groups of recently bereaved or recently

disabled older adults and a control group matched on sex, age, and SES. They examined

whether daily desirable and undesirable events mediated the association between group

status (e.g., bereaved, disabled) and distress and well-being. They were particularly

interested in whether daily life events would be differentially associated with affective

outcomes under periods of stress (bereavement, disability) compared to a control group

without a recent major life stressor. They found that daily desirable and undesirable

events mediated the relation between disability status and distress and well-being, but

daily life events did not function as a mediator between bereavement group status and

affective outcomes. Additionally, they found that positive events become more highly

related to distress and well-being under the stressful condition of disability compared to a

control group (matched on age, sex, and SES). These findings are in line with work by

other researchers who have documented that under 'normal' conditions, positive events

are mainly associated with positive affect, however, under stressful conditions positive

events are related to positive and negative affect (Cohen & Hoberman, 1983; Zautra,

Affleck, Tennen, Reich, & Davis, 2005). It can be argued that the experience of physical

disability reflects a context in which the effect of positive events on negative affect is

strengthened (Meeks & Depp, 2003).

Findings by Zautra et al. (1990) demonstrate that pleasant events account for the

association between disability and depressive symptoms, among older adults recently

disabled. However, additional questions remain: First, Zautra et al. (1990) measured

disability categorically (i.e., disabled or not disabled) using a cut-off score of > 7 on a measure of activities of daily living (ADLs) to determine disability group status. But, milder forms of disability have been shown to also disrupt mood (Williamson, 2000). Measuring disability as a continuous, rather than a discrete variable, could elucidate whether engagement in pleasant events mediates the relation between varying severity levels of disability and affective outcomes. Second, Zautra et al. (1990) examined mean levels of desirable events, but did not account for subjective appraisal of the pleasantness of events. Based on the behavioral model of depression, the frequencies of pleasant events, as well as pleasantness ratings are important for modifying mood levels (Lewinsohn, 1974). Further, the cross-product of frequency of pleasant events and pleasantness ratings has been thought to be most important when intervening to improve mood, because it takes into account anticipated obtained reinforcement (Dimidjian et al., 2011). In other words, the likelihood that increased engagement in pleasant events co-occurs with increased positive affect and lower negative affect.

Both the frequency of events and frequency by pleasantness of events product have been found to be associated with affective outcomes (Hopko et al., 2003; Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1972; MacPhillamy & Lewinsohn, 1974). Moreover, past research has demonstrated that the frequency of pleasant events is associated with affective outcomes in older adults, even after controlling for perceived pleasantness, which may be shaded by depressed mood (Meeks et al., 2009). The magnitudes of correlations between frequency of pleasant events and affective outcomes before and after controlling for pleasantness ratings were found to be nearly identical (before: Geriatric Depression Scale (GDS) $r = -.52$, $p < .01$; after: GDS $r = -.40$, $p < .05$;

before: positive affect $r = .65$, $p < .01$; after: positive affect $r = .61$, $p < .01$; Meeks et al.,

2009). Thus, one would expect that both the frequency of events, as well as frequency by

pleasantness of events product would have similar power to describe the relation between

disability and depressive symptoms. However, this remains to be empirically tested.

Depressive Symptoms and Positive Affect

Reducing depressive symptoms in vulnerable older adults also depends on

understanding the relation between disability and not only depressive symptoms, but also

positive aspects of emotional health, such as positive affect and meaning in life (Meeks &

Depp, 2003). Past research suggests that depressive disorders are characterized not only

by an elevation of negative affect, but also by reduced positive affect (Brown, Chorpita,

& Barlow, 1998; Seidlitz, Lyness, Conwell, Duberstein, & Cox, 2001). Moreover,

treatment research has demonstrated that depressive symptoms can be reduced by

interventions targeting positive emotions and feelings (e.g., positive affect, meaning in

life; Sin & Lyubomirsky, 2009).

Meeks and Depp (2003) elaborated on the relation between positive and negative

affect as it relates to older adults with depression. They summarized research

demonstrating that under 'normal' conditions, positive and negative affect are largely

independent (Lawton, 1996; Lawton, Potter, Katz, & Nesselroade, 1996; Zautra, Potter,

& Reich, 1997). However, research findings suggest that under periods of stress, such as

the experience of disability, the relation between positive and negative affect becomes

unified (Meeks & Depp, 2003; Zautra et al., 1990). These findings suggest that the

reduction of depressive symptoms can be facilitated by increasing positive affect and

other positive aspects of emotional health, such as meaning in life.

Statement of the Problem

Psychological (e.g., sense of control) and behavioral (e.g., engagement in pleasant events) factors accounting for the relation between disability and depressive symptoms in late life are largely unknown. Of the few studies that have examined mediators of the disability-depressive symptoms relation in older adults, findings are mixed and lack replication (reviewed by Bamonti & Fiske, manuscript in progress). Further, the process of identifying potential mediators would benefit from research questions grounded in empirically-supported etiological models of depression. The behavioral model of depression posits that depressed mood results from a low rate of positive reinforcement in the environment, which is precipitated by life stressors (Lewinsohn et al., 1985). Chronic disability is conceptualized as a life stressor (Bruce, 2001) and as such, may be associated with affective outcomes through reduced exposure to positive reinforcement. Past research has demonstrated associations between disability and frequency of pleasant events (Zautra, Reich, & Guarnaccia, 1990; Zimmer, Hickey, & Searle, 1995, 1997), as well as the relation between frequency of pleasant events and mood in individuals with disability (Duke et al., 2002; Mausbach et al., 2008; Warr et al., 2004); however, the frequency of pleasant events and frequency by pleasantness of events product have yet to be examined as possible mediating variables linking disability and affective outcomes in older adults. In addition, few research studies have examined mediators of the relation between disability and positive aspects of emotional health, such as positive affect and meaning in life, although modifying positive affect may be critical to depression interventions in late life (Meeks & Depp, 2003).

The current study was designed to examine whether the frequency of pleasant events over the past month, as well as frequency by pleasantness of events product over the past month, mediated the association between physical disability and affective outcomes (depressive symptoms, positive affect, meaning in life), after controlling potential confounds (age, gender, education, cognitive functioning, and perceived social support; Blazer, 2003). Physical disability and depressive symptoms are strongly related in older adults (Antsey et al., 2007; Bruce, 2001; Kennedy et al., 1990; Ormel et al., 2002). Further, previous research has demonstrated that disability is associated with reduced participation in pleasant events (Zautra et al., 1990; Zimmer et al., 1995, 1997). Moreover, an inverse association between frequency of pleasant events and negative affect has been documented (Duke et al., 2002; Mausbach et al., 2008; Warr et al., 2004). Based on these findings, it was predicted that frequency of pleasant events would mediate the relation between disability and affective outcomes in older adults (Hypotheses 1a-c). Specifically, it was predicted that disability would have an indirect effect on affective outcomes through frequency of pleasant events. It was predicted that disability would be associated with lower frequency of pleasant events over the past month, and that lower frequency of pleasant events would be associated with greater depressive symptoms (Hypothesis 1a), lower positive affect (Hypothesis 1b) and lower meaning in life (Hypothesis 1c), after controlling for covariates. Similarly, it was predicted that disability would have an indirect effect on affective outcomes through frequency by pleasantness of events product (Hypotheses 2a-c). It was predicted that disability severity would be associated with frequency by pleasantness of events product over the past month, and that lower frequency by pleasantness of events product would be associated with greater

depressive symptoms (Hypothesis 2a), lower positive affect (Hypothesis 2b), and lower

meaning in life (Hypothesis 2c), after controlling for covariates.

Methods

Participants

Participants were (N = 82) adults 65 years and older recruited from Morgantown,

WV and surrounding towns/cities. They were recruited from multiple settings, including

assisted and independent living facility, senior centers, and community events (e.g.,

health fairs). Surveys were completed in the Mental Health and Aging Lab at West

Virginia University or at the participants' residence, based on personal preference.

Participants had a mean age of 77.6 years (SD = 8.0 years, range = 60-97 years) and

64.6% were female (n = 53). The majority was White (n = 80, 97.6%); one participant

was Black (1.2%); and one participant was Native American (1.2%). Sample

characteristics are presented in Table 1.

Measures

Activities of Daily Living and Instrumental Activities of Daily Living

(ADLs and IADLs; Appendix A). Activities of Daily Living (ADL; Katz, Ford,

Moskowitz, Jackson, & Jaffe, 1963) and Instrumental Activities of Daily Living (IADL;

Lawton & Brody, 1969) scales include 21 items of physical disability. ADLs and IADLs

were combined to produce an overall severity of disability score, with higher scores

indicating greater severity of disability. Research findings support the unidimensional

structure of the disability derived from combined ADL and IADL items (Spector &

Fleishman, 1998). Participants were asked to rate their ability to perform a certain task

(e.g., "Can you take your medicine correctly?") by checking "I cannot perform this activity," "I can perform this activity with some help," or "I can perform this activity without any help." These statements were scored from 0-2. Items were reversed scored such that higher scores indicated more severe physical disability with a maximum score of 42. Internal consistency of the combined measure with community-dwelling older adults has been found to be excellent, Cronbach's α = .90 (Fiske, Bamonti, Nadorff, Petts, & Sperry, 2014). In the current sample, Cronbach's α = .95.

Geriatric Depression Scale-Short Form (GDS-SF; Appendix B). The GDS-SF is a 15-item self-report screening instrument of depressive symptoms in older adults (Brown & Schinka, 2005). The GDS-SF is a shortened version of the original 30-item Geriatric Depression Scale (Yesavage et al., 1983). Participants rated either "yes" or "no" regarding whether they have experienced each symptom in the past week. Scores were summed to create an overall severity score, with higher scores indicating greater severity of depressive symptoms. A cut-off score of ≥ 5 has demonstrated adequate sensitivity and specificity in distinguishing older adults diagnosed with Major Depressive Disorder compared to older adults without depression (84.3% sensitivity, 73.8% specificity; Mitchell, Bird, Rizzo, & Meader, 2010). The construct validity of the GDS-SF has been demonstrated in community-dwelling older adults and medical patients (Brown & Schinka, 2005; Friedman, Heisel, & Delavan, 2005). In addition, the GDS-SF has demonstrated adequate internal consistency (Chronbach's α > .70; e.g., Chiang, Green, & Cox, 2009; Pedraza, Dotson, Willis, Graff-Radford, & Lucas, 2009). In the current sample Cronbach's α = .89.

Geriatric Suicide Ideation Scale-Meaning in Life Subscale (GSIS-MIL;

Appendix C). The GSIS is a 31-item self-report measure of suicide-related ideation in older adults (Heisel & Flett, 2006). The GSIS has been previously validated as a measure of suicide ideation (Heisel & Flett, 2006). Items are scored on a Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*). For the purposes of the current study, only the 8-item meaning in life subscale was used. Example items include, "Life is extremely valuable to me" and "I find joy and beauty in life." Higher scores reflect greater meaning in life. Construct validity has been demonstrated with the MIL subscale scores correlated as expected with depressive symptoms and psychological well-being (Heisel & Flett, 2006). The MIL subscale has demonstrated adequate internal consistency ($\alpha \geq .70$; Heisel & Flett, 2006; Van Orden, Cukrowicz, Witte, & Joiner, 2012). In a sample of older adults, the average MIL score was 16.0 ($SD = 4.5$, range = 8-34). In the current sample Cronbach's $\alpha = .89$.

Positive and Negative Affect Schedule (PANAS; Appendix D). Mood was measured with the 20-item PANAS (Watson, Clark, & Tellegen, 1988). The PANAS is comprised of two, 10-item affect scales providing a brief measure of positive and negative affect ($\alpha = .88$ and .87, respectively). Participants rated the extent to which they experienced each emotion over the past week, (1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = very much). The construct validity of the PANAS has been demonstrated in older adults (Lawton, Kleban, Dean, Rajagopal, & Parmelee, 1992). In the current sample Cronbach's $\alpha = .82$.

The Older Person's Pleasant Events Schedule (OPPES; Appendix E). The OPPES is a 66-item self-report measure of the frequency of events over the past month and pleasantness ratings over the past month (Teri & Lewinsohn, 1982). The OPPES was

adapted for older adults based on the original Pleasant Event Schedule (MacPhillamy &

Lewinsohn, 1982). Participants are asked to rate the frequency of the event over the past

month, with response choices of 0 (not at all), 1 (1-6 times), or 2 (7 or more times).

Participants rated the pleasantness of each activity with possible response choices of 0

(Not pleasant), 1 (Somewhat pleasant), and 3 (Very pleasant). Three scores can be

derived from the OPPES, including mean frequency ratings, mean pleasantness ratings,

and the mean cross-product ratings (Frequency x Pleasantness of events), reflecting

anticipated reinforcement value. Internal consistency has been demonstrated to be

adequate: Frequency ($\alpha = .97$), Pleasantness ($\alpha = .95$), Frequency x Pleasantness of

events ($\alpha = .96$). In a sample of older adults, mean Frequency was 1.10, mean

pleasantness was 1.41, and mean Frequency x Pleasantness of events was 1.73 (Teri &

Lewinsohn, 1982). In the current sample Cronbach's $\alpha = .95$.

In addition to the OPPES, 18 items were added from the Pleasant Event Schedule-

Nursing Home (PES-NH), a derivative of the OPPES designed specifically for nursing

home residents (Meeks et al., 2009). These additional items were added in order to

provide activities relevant to more disabled community-dwelling older adults. The items

that were added from the PES-NH are bolded in Appendix E.

Duke Social Support Index-Abbreviated (DSSI; Appendix F). The abbreviated

DSSI is a shortened version of the original 35-item instrument measuring perceived

social support (Landerman, George, Campbell, & Blazer, 1989). The 11-item measure

has demonstrated adequate psychometric properties in a sample of older adult women

(Powers, Goodger, & Byles, 2004) and chronically-ill older adults (Koenig et al.,1993).

The DSSI contains two subscales, including satisfaction with support (7 items) and social

interaction (4 items). In the current study, only the satisfaction with support scale was used. Participants were instructed to select whether they are 1 (hardly ever), 2 (some of the time), or 3 (most of the time) satisfied with their current level of social support. Higher scores indicate greater satisfaction with support. Based on an exploratory factor analysis of the abbreviated DSSI, one item was dropped from the satisfaction subscale ("How satisfied are you with the kinds of relationships you have with your family and friends?"), because of poor loading on either factor and a low communality of .01 (Powers et al., 2004). Factors loadings for the remaining six items of the satisfaction with support subscale ranged from .64-.77, indicating strong loadings on the factor (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Internal consistency of the satisfaction with support subscale has been found to be good, $\alpha = .80$; Powers et al., 2004). Construct validity of the satisfaction with support subscale has been demonstrated with positive and small-to-moderate correlations with perceived health, as well as a negative and moderate correlation with overall stress (Powers et al., 2004). In the current sample Cronbach's $\alpha = .85$.

Montreal Cognitive Assessment (MoCA; Appendix G). The MoCA is a brief, 30-item screening tool for mild cognitive impairment (Nasreddine et al., 2005). A cut-off score of 26/30 has been shown to accurately detect 90% of subjects positive for mild cognitive impairment. The degree to which the MoCA accurately excludes (specificity) normally functioning participants is 87% (Nasreddine et al., 2005).

Chronic Illness Checklist (Appendix H). A simple checklist of common diseases and disorders in older adults was used to measure self-reported chronic illness. Response choices were either "yes" or "no." Items marked "yes" were summed to create

an overall value reflecting the number of chronic illness experienced by the participant. Similar values derived from check-list formats have been found to have moderate-to-high correlations with physician reports of medical illness (Okura, Urban, Mahoney, Jacobsen, & Rodeheffer, 2004) .

Demographics (Appendix I). Participants were asked to report their age, sex, race, ethnicity, marital status, religious affiliation, education level, whether they lived alone or with others. In addition, health literacy was measured with a one-item question ("How confident are you filling out forms by yourself?;" Morris, MacLean, Chew, & Littenberg, 2006). Participants' use of assistive aids, such as walkers or wheelchairs, was measured with a one-item yes or no question ("Do you any aids, such as a walker, or any other special equipment for personal care of everyday activities"). A one-item measure of self-rated health **("**How would you rate your health at the present time?") was used to assess perceived health. Response choices included: excellent, good, fair, or poor. This one item has been found to be strongly associated with physical disability (Idler & Benyamini, 1995) and depressive symptoms in older adults over time (Han, 2002).

Procedures

 Participants were approached by a member of the research team and invited to take part in the research study. Eligibility included being 65 years of age or older and capacity to consent to research. Participants who indicated willingness to participate in the research study were consented prior to administration of questionnaires.

Participants were read paper and pencil questionnaires. Length of study session was approximately 90 minutes. Participants received $10 compensation for their time.

Analyses

Simple mediation analyses with each proposed mediator (frequency of pleasant events and frequency x pleasantness of events) predicting affective outcomes were conducted using Preacher and Hayes' (2008) bootstrapping macro. Bias-corrected bootstrapping was selected to test mediation analyses compared to other methods, such as the Baron and Kenny technique or the Sobel test, because it has been found to found to produce less biased estimates and reduce the risk of Type I error when samples sizes are relatively small (~ 500 cases; Preacher & Hayes, 2008; Shrout & Bolger, 2002). Covariates were included in mediation models based on whether they were significantly ($p < .05$) related to the dependent variables. Analyses were conducted in Statistical Package for the Social Science (SPSS; version 21) (IBM Corp., 2012).

Results

Missing Data. Across study variables, amount of missing data was low ($< 5\%$). To capitalize on available data, total scores were prorated if at least 80% of the items were completed. Scores for eighteen cases were prorated across study variables. One participant had less than 80% complete data on one variable (OPPES) and was dropped from the mediation analyses. The final sample N ranged from 81-82 across study variables, with variation due to missing data.

Assumptions. Prior to conducting analyses, assumptions of univariate and multivariate statistics were examined. Outliers were examined by converting total scores to Z-scores. Values > 3.29 were considered outliers and inspected to explore whether they were indeed part of the intended sample (Tabachnick & Fidell, 2007, pp.73). Inspection of Z-scores revealed univariate outliers on GDS, PANAS-PA, GSIS-MIL, OPPES-pleasantness, MoCA, DSSI, and physical disability. However, the few outliers

appeared to be valid responses, with the greatest Z-score of 4.36 on GDS. Thus, no

correction was made for univariate outliers.

Next, normality of the data was examined by calculating skew and kurtosis for

each variable. Values > 3.29 are indicative of non-normality (Tabachnick & Fidell, 2007,

pp.73). Among study variables, this assumption was violated for GDS (skew=9.7,

kurtosis=14.7), MoCA (skew=-5.0, kurtosis=4.7), and physical disability (skew=7.9,

kurtosis=8.4). GDS and physical disability scores were transformed with square root

transformations, respectively (Tabachnick & Fidell, 2007, pp.89). Transformations

successfully corrected for non-normality. Given that the distribution of MoCA scores was

negatively skewed, scores were transformed using a square root transformation with a

constant subtracted from each score (Tabachnick & Fidell, 2007, pp.89). Transformations

successfully normalized the distribution of MoCA scores.

The assumption of linearity was also tested through visual inspection of

scatterplots between the independent and dependent variables. Visual inspection revealed

a linear relation between variables. Next, multivariate outliers were examined using

Mahalanobis distance. For the present sample, Mahalanobis difference value exceeding

22.5 was considered extreme (df = 6, α = .001; Tabachnick & Fidell, 2007, pp. 949).

Mahalanobis distance was 6.0, below the critical threshold.

Sample characteristics are provided in Table 1. The current sample was

characterized by low levels of physical disability based on mean ratings of disability.

Forty-five percent of the sample reported use of an assistive aid, and assistive aid use was

significantly associated with greater levels of disability, $t(37.9) = 5.32$, $p = .000$. Using a

clinical-cut-off of ≥ 5 on the GDS (Mitchell et al., 2010), suggesting likelihood of

clinically significant depressive symptoms, 8 participants (9.8%) were above the cut-off, which is comparable, or lower than previous samples in the general population and primary care samples (Wancata, Alexandrowicz, Marquart, Weiss, & Friedrich, 2006). Meaning in life was slightly higher than previously reported in residential samples of older adults (Heisel & Flett, 2008), while positive affect levels were greater than levels found by Watson et al. (1988; $M = 33.3$; $SD = 7.2$) in a sample of undergraduate college students. Mean scores on the OPPES were comparable to previously reported, non-institutionalized older adult samples (Teri & Lewinsohn, 1982).

Means, standard deviations, and Pearson's correlation coefficients for study variables are provided in Table 2. As expected, there were significant bivariate correlations between physical disability and affective outcomes. Frequency of pleasant events, pleasantness ratings, and the frequency by pleasantness of events product were significantly related to affective outcomes. Participants who endorsed "yes" for GDS Item 2, which asked "Have you dropped many of your activities and interests" reported engaging in fewer pleasant events ($M = 1.05$, $SD = .43$) compared to participants who answered "no" ($M = 1.24$, $SD = .25$; $t(6.4) = .274$, $p = .274$), although there was not a statistically significant difference between groups. Physical disability was significantly negatively associated with frequency of pleasant events and with the frequency by pleasantness of events product, but not significantly related to pleasantness ratings. Greater physical disability was associated with lower perceived social support.

In terms of potential covariates, social support was significantly negatively associated with depressive symptoms, but not significantly related to meaning in life, or positive affect. Cognitive functioning was significantly associated with depressive

symptoms, but not meaning in life or positive affect. Thus, social support and cognitive functioning was controlled for in models predicting depressive symptoms.

Demographic variables were also examined in relation to study variables. Age was positively associated with MoCA scores and disability, but not significantly associated with other study variables (Table 2). Independent sample t-tests were conducted to examine differences between men and women on study variables. Average scores across study variables did not differ for men and women. ANOVA F tests were conducted to examine differences in average scores on study variables by marital status (single, married/live-in partner, divorced/separated). Disability levels differed by marital status, $F(3, 78) = 4.4$, $p < .01$. Participants who are married or who have a live-in partner ($n = 33$) had significantly lower levels of disability ($M = 2.3$, $SD = 6.6$) compared to participants who are widowed ($n = 33$; $M = 6.3$, $SD = 7.5$). MoCA scores also differed by marital status, $F(3, 77) = 2.9$, $p < .05$. There was a trend for participants who were married or who have a live-in partner ($n = 32$) to have higher MoCA scores ($M = 25.3$, $SD = 3.3$) compared to widowed participants ($n = 33$; $M = 21.7$, $SD = 6.1$). There were no other significant differences by marital status on any other study variable.

A second ANOVA was conducted examining whether there were differences on study variables by education level (less than high school, high school or GED, some college, or college degree). MoCA scores differed by education level, $F(3, 72) = 5.5$, $p < .01$. Participants who had less than a high school education ($n = 8$) had lower MoCA scores ($M = 17.3$, $SD = 7.6$) compared to participants with either some college ($M = 25.3$, $SD = 4.3$), or a college degree ($M = 25.1$ $SD = 3.4$). Level of disability also differed by education level, $F(3, 73) = 3.2$, $p < .05$. Participants with less than a high school degree

reported more disability ($M = 12.1$, $SD = 10.4$) compared to participants with a college

degree ($M = 3.7$, $SD = 7.9$). Severity of depressive symptoms also differed by education

level, $F(3, 73) = 7.3$, $p < .001$. Participants with less than a high school education had

more severe levels of depressive symptoms ($M = 6.6$, $SD = 4.7$) compared to participants

with a high school diploma ($M = 1.6$ $SD = 1.9$), some college ($M = 1.5$, $SD = 2.2$), or a

college degree ($M = 1.1$, $SD = .90$). Levels of positive affect differed by education level,

$F(3, 73) = 3.2$, $p < .05$. Participants with less than a high school education ($M = 31.0$, SD

$= 12.1$) had significantly lower positive affect than participants with some college ($M =$

40.4, $SD = 4.7$). Levels of meaning in life differed by education level, $F(3, 73) = 4.3$, $p <$

.01. Participants with less than a high school education had significantly lower levels of

meaning in life ($M = 30.1$, $SD = 5.7$) compared to participants with some college ($M =$

35.7, $SD = 4.2$), or a college degree ($M = 35.7$, $SD = 3.2$). Frequency of pleasant events

differed by education level, $F(3, 73) = 4.6$, $p < .01$. Participants with less than high

school education reported engaging in fewer pleasant events over the past month ($M =$

$.92$, $SD = .34$) compared to either participants with some college ($M = 1.3$, $SD = .24$) or a

college degree ($M = 1.3$, $SD = .21$). Given differences in affective outcomes by education

level, education level was also included as a covariate in meditation analyses for all

dependent variables.

  Hypothesis 1a predicted that disability would have a significant indirect effect on

depressive symptoms through frequency of pleasant events. Specifically, it was

hypothesized that physical disability would be associated with lower frequency of

engagement in pleasant events, which would, in turn, be associated with greater levels of

depressive symptoms. After controlling for education level, MoCA, and social support,

disability had a significant indirect effect on depressive symptoms through frequency of pleasant events (unstandardized coefficient = 0.16, 95% bias-corrected CI [0.03, 0.41]). The direct effect of physical disability remained significant after accounting for the indirect effect (unstandardized coefficient = 0.59, 95% bias-corrected CI [0.19, 0.98]), suggesting partial mediation. The combined total effect was 0.74, with the 95% bias-corrected CIs being 0.35 to 1.14. In summary, participants with greater physical disability engaged in a_1 = .17 fewer units of pleasant events, and those participants who engaged in relatively fewer pleasant events reported relatively greater depressive symptoms, b_1 = .93 (Figure 1a).

Hypothesis 1b predicted that disability would have a significant indirect effect on meaning in life through frequency of pleasant events. It was hypothesized that physical disability would be associated with lower frequency of engagement in pleasant events, which would, in turn, would be associated with lower meaning in life. After controlling for education level, disability had a significant indirect effect on MIL though frequency of pleasant events (unstandardized coefficient = -1.58, 95% bias-corrected CI [-3.19, -0.47]). The direct effect of physical disability was no longer significant after accounting for the indirect effect (unstandardized coefficient = -1.19, 95% bias-corrected CI [-2.80, 0.47]), suggesting full mediation. The combined total effect was -2.76, with the 95% bias-corrected CIs being -4.62 to -0.91. In total, participants with greater physical disability engaged in a_1 = .18 fewer units of pleasant events, and those participants who engaged in relatively fewer pleasant events reported relatively lower meaning in life, b_1 = 8.71 (Figure 1b).

Hypothesis 1c predicted that disability would have a significant indirect effect on positive affect through frequency of pleasant events. It was hypothesized that physical disability would be associated with lower frequency of engagement in pleasant events, which would, in turn, be associated with lower positive affect. After controlling for education level, disability had a significant indirect effect on positive affect through frequency of pleasant events (unstandardized coefficient = -2.65, 95% bias-corrected CI -5.38, -0.88]). The direct effect of physical disability was no longer significant after accounting for the indirect effect (unstandardized coefficient = -1.75, 95% bias-corrected CI [-4.56, 1.51]), suggesting full mediation. The combined total effect was -4.40, with the 95% bias-corrected CIs being -7.54 to -1.26. Participants with greater physical disability engaged in $a_1 = .18$ fewer units of pleasant events, and those participants who engaged in relatively fewer pleasant events reported relatively lower positive affect, $b_1 = .14.62$ (Figure 1c).

Hypothesis 2a predicted that disability would have a significant indirect effect on depressive symptoms through frequency by pleasantness of events product (*obtained reinforcement*). Specifically, it was predicted that physical disability would be associated with lower obtained reinforcement, which would, in turn, be associated with greater depressive symptoms. After controlling for education level, MoCA and social support, disability had a significant indirect effect on depressive symptoms through obtained reinforcement (unstandardized coefficient = 0.11, 95% bias-corrected CI [0.01, 0.35]). The direct effect of physical disability remained significant after accounting for the indirect effect through obtained reinforcement (unstandardized coefficient = 0.66, 95% bias-corrected CI [0.27, 1.05]). The combined total effect was 0.77, with the 95% bias-

corrected CIs being 0.38 to 1.16. In summary, participants with greater physical disability engaged in $a_1 = .31$ fewer units of pleasant events, and those participants who engaged in relatively fewer pleasant events reported relatively greater depressive symptoms, $b_1 = .34$ (Figure 2a).

Hypothesis 2b predicted that obtained reinforcement would have a significant indirect effect on meaning in life. It was hypothesized that physical disability would be associated with lower obtained reinforcement, which would, in turn, be associated with lower meaning in life. Disability had a significant indirect effect on meaning life through obtained reinforcement (unstandardized coefficient = -1.10, 95% bias-corrected CI [-2.59, -0.13]). The direct effect of physical disability was significant after accounting for the indirect effect (unstandardized coefficient = -1.65, 95% bias-corrected CI [-3.26, -0.04]), suggesting partial mediation. The combined total effect was -2.75, with the 95% bias-corrected CIs being -4.62 to -0.89. Overall, participants with greater physical disability engaged in $a_1 = .30$ fewer units of pleasant events, and those participants who engaged in relatively fewer pleasant events reported relatively lower meaning in life, $b_1 = 3.64$ (Figure 2b).

Hypothesis 2c predicted that obtained reinforcement would have a significant indirect effect on positive affect. It was hypothesized that physical disability would be associated with lower obtained reinforcement, which would, in turn, be associated with lower positive affect. After controlling for education level, disability had a significant indirect effect on positive affect through obtained reinforcement (unstandardized coefficient = -1.89, 95% bias-corrected CI -4.38, -0.26]). The direct effect of physical disability was no longer significant after accounting for the indirect effect

(unstandardized coefficient = -2.50, 95% bias-corrected CI [-5.19, 0.20]), suggesting full mediation. The combined total effect was -4.40, with the 95% bias-corrected CIs being -7.56 to -1.24. In total, participants with greater physical disability engaged in a_1 = .30 fewer units of pleasant events, and those participants who engaged in relatively fewer pleasant events reported relatively lower positive affect, b_1 = 6.26 (Figure 2c).

Post Hoc Analyses. Past researchers have questioned whether pleasantness ratings contribute additional information above and beyond frequency ratings (Hopko & Mullane, 2008; Lewinsohn & Libet, 1972; O'Hara & Rehm, 1979). In the present study, the magnitude of the indirect effect of disability through frequency of events and the cross-product were largely identical in magnitude, suggesting little added value was gained from the inclusion of pleasantness ratings. It is possible that the indirect effect of disability on affective outcomes through obtained reinforcement may only reflect the contribution of frequency of pleasant events.

To test this question, post hoc meditational analyses were conducted with frequency ratings added as a covariate. After controlling for frequency ratings, the indirect effect of disability on depressive symptoms through obtained reinforcement was non-significant (unstandardized coefficient = 0.02, 95% bias-corrected CI [-.02, 0.14]). Similar results were found for meaning in life (unstandardized coefficient = .24, 95% bias-corrected CI [-0.08, 0.85]) and positive affect (unstandardized coefficient = 0.51, 95% bias-corrected CI [0.01, 1.50]). Results suggest that there is minimal added statistical value gained from including pleasantness ratings.

Discussion

Consistent with the first set of hypotheses (H1a-1c), frequency of pleasant events mediated the association between physical disability and affective outcomes, including depressive symptoms, meaning in life, and positive affect. Results also supported the second set of hypotheses (H2a-2c); frequency by pleasantness of events product mediated the association between physical disability and affective outcomes. Mediation effects remained after controlling for covariates, lending strength to the current results. Pleasant events completely mediated the association between physical disability and meaning in life, as well as the association between physical disability and positive affect. Pleasant events were found to partially mediate the effect of physical disability on depressive symptoms. Post hoc analyses demonstrated that obtained reinforcement did not contribute additional explanatory power in the prediction of affective outcomes above and beyond frequency ratings. The current findings provide an empirical basis for further hypothesis testing examining the function of pleasant events over time, as well as other psychological and social factors that may also account for the association between physical disability and affective outcomes.

The present findings confirm past results demonstrating negative associations between frequency of pleasant events and frequency by pleasantness of events product and depression diagnosis (Hopko et al., 2003; Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1972; MacPhillamy & Lewinsohn, 1974), and positive associations with positive mental health outcomes (e.g., positive affect; Mausbach et al., 2008). In addition, the present findings are consistent with a study by Zautra and colleagues (1990) who found that number of daily desirable and undesirable events mediated the association between

disability group status (disabled vs. not disabled) and distress and well-being, over three months. Results provide support for the behavioral model of depression (Lewinsohn et al, 1985). Moreover, findings are consistent with behavioral models of depression that have been adapted for geriatric subsamples (Meeks and Depp, 2003). Findings are in line with research demonstrating the efficacy of behavior therapy among older adults with disability (Meeks, Looney, Van Haitsma, & Teri, 2008).

Researchers have speculated as to whether pleasantness ratings provide value above and beyond frequency ratings of pleasant events. Past studies have failed to demonstrate an added value in measuring pleasantness ratings (Hopko & Mullane, 2008; Lewinsohn & Libet, 1972; O'Hara & Rehm, 1979), and current results support this notion. Results indicate that in situations where respondent burden is a concern, omission of pleasantness ratings is an option and will likely result in negligible loss of information.

Findings also further our understanding of the nature of the relation between frequency of pleasant events and negative (e.g., depressive symptoms) and positive mental health variables (e.g., meaning in life, positive affect). While engagement in pleasant events fully mediated the association between physical disability and meaning in life and positive affect, partial mediation was found predicting depressive symptoms. The pattern of results is consistent with previous research demonstrating a stronger association between frequency of pleasant events and positive affect compared to negative affect from data derived from survey-based data (Kanter, Mulick, Busch, Berlin, & Martell, 2007; Lawton, 1996) and daily diary studies (Hopko et al., 2003; Mausbach et al., 2008; Mausbach, Roepke, Depp, Patterson, & Grant, 2011).

The partial meditational findings in models predicting depressive symptoms suggest that other factors account for the association between disability and depressive symptoms. Revisiting original conceptualizations of the behavioral model of depression may provide some clues as to what these other factors may be. Ferster (1973) elaborated on the function of negative reinforcement positing that escape and avoidance of internal and external sources of distress perpetuate depressed mood because they are ineffective in removing distress over the long term and reduce opportunity to make contact with positive reinforcement. Manos and colleagues (2010) further described the process through which individuals with mood disturbance attempt to avoid negative mood through escape and avoidance, which may be behavioral (e.g., excessive sleep) or cognitive (e.g., rumination) in nature. Given that past research has demonstrated a stronger association between pleasant events and PA compared to NA or depressive symptoms (Lawton, 1996; Mausbach et al., 2008; Mausbach et al., 2011), a next step will be to consider what role avoidance has in the connection between physical disability and depressive symptoms.

As predicted, physical disability was negatively associated with frequency of pleasant events and with the frequency by pleasantness of events product. Physical disability directly affects an individual's ability to engage in pleasant events (Williamson, 1998), which may in part explain the robust association between disability and depressive symptoms in older adults (Antsey et al., 2007; Kennedy et al., 1990; Ormel et al., 2002). Physical disability may also spur negative beliefs about the self or one's ability to promote change on the environment given threats to independence and autonomy. Past research has demonstrated that physical disability is associated with perceived loss of

control and lower self-esteem (Yang, 2006). These types of beliefs may foster negative

cognitions leading to depressed mood (e.g., Alloy et al., 2006). In addition, beliefs

regarding the self and one's ability to control the environment may contribute to reduced

contact with positive reinforcement (Lewinsohn et al., 1985). In the current study,

physical disability was associated with lower frequency of pleasant events, but not

perceptions of pleasantness, suggesting that physical disability does not disrupt

sensitivity to environmental reward. This finding is congruent with the role of life

stressors proposed in Lewinsohn's (1985) Integrated Behavioral Model of Depression.

He posited that life stressors, such as disability, could trigger depression by disrupting an

individual's behavioral repertoire. According to the model, it is the degree to which

changes in an individual's behavior repertoire reduce positive reinforcement or aversive

control (i.e., avoidance) that causes mood disturbance.

Clinical Implications

Attenuating the relation between physical disability and depressive symptoms

hinges on breaking the cycle between physical disability and reduced engagement in

pleasant events. Behavioral therapy is an empirically-supported treatment for depression

in older adults aimed at increasing contact with positive reinforcement (Scogin et al.,

2005), which has been found to be efficacious in several geriatric subsamples, including

inpatient psychiatric patients (e.g., Snarski et al., 2011), psychiatric outpatients (e.g.,

Thompson & Gallagher, 1984), nursing home residents (e.g., Meeks et al., 2008),

medically-ill older adults (e.g., Lichtenberg, Kimbarow, Morris, Vangel, 1996), and

community-dwelling older adults (e.g., Haringsma et al., 2006; Rokke, Tomhave, &

Jocic, 1999). However, the application of behavioral therapy to older adults with physical disability may be challenging given reduced functional ability.

Changes in positive reinforcement are caused by several factors, including the number of events reinforcing to an individual, availability of events, and an individual's level of instrumental behavior needed to make contact with positive reinforcement (Lewinsohn, 1974). Hopko and Mullane (2008) elaborate on factors that increase or decrease contact with positive events, providing a useful starting point when working with clients to increase engagement in pleasant events. First, are there environmental barriers to making contact with positive reinforcement, such as social isolation and poverty? For the disabled older adult, a barrier may be transportation to events outside the home. Second, are there instrumental barriers that limit contact with positive reinforcement. For instance, does the patient have adequate social skills? Are there cognitive issues interfering with socializing or following through on plans to socialize? Third, it is important to consider both the quantity (e.g., number and intensity) and the quality (e.g., type: social, intellectual; function: mastery) of events. Fostering engagement in an adequate number of pleasant events, as well as events described by the patient as reinforcing, will likely provide optimal mood changes (Hopko & Mullane, 2008).

The efficacy of BT to increase mood among older adults with disability relies on adapting current pleasant events, as well as replacing old activities with new ones. Adapting pleasant events may involve modification of the activity, such as bold print materials for reading, use of personal assistance (e.g., help from others), or assistive equipment (e.g., cane, walker). Findings suggest that among individuals with chronic illness, asking others for help or use of assistive aids, is associated with greater positive

affect (Wahl, Becker, Burmedi, & Schilling, 2004) and lower suicidal ideation (Fiske, Bamonti, Nadorff, Petts, & Sperry, 2013). Problem solving around ways of adapting activities in session can be useful in facilitating engagement in pleasant events. For example, problem solving around how to modify the home environment and activities within the home to match the functional level of the individual has been found to result in increased activity levels and decreased depressive symptoms (Kiosses, Teri, Velligan, & Alexopolous, 2011). In addition, assessment of the size and quality of the patient's social support network can provide information about whether there are family members and friends of whom the patient can request assistance.

Although not assessed in the current study, another component to consider within the context of treatment is the individual's perception of health and of activity restriction. Findings suggest that poorer perceptions of physical health, but not physician ratings of illness severity, are associated with reduced frequency of pleasant events (Duke et al., 2002). In addition, there is some evidence to suggest that perception of activity restriction influences the association between frequency of pleasant events and mood. For instance, Mausbach et al. (2011) examined whether perception of activity restriction influenced the association between frequency of pleasant events and mood among caregivers of individuals with Alzheimer's. They found that the combination of high perceptions of activity restriction due to caregiving, along with low frequency of pleasant events, was associated with greater depressive symptoms, negative affect, and role overload compared to caregivers who reported a combination of high frequency of pleasant events and high perceived restriction or those who reported low frequency of pleasant events and low perceived restriction. These findings suggest that one barrier to increasing

engagement in pleasant events may be perceptions of activity restriction. Similar

perceptions of restriction are found among individuals with chronic pain and contribute to

behavioral disengagement and decreased mood (Turk & Okifuji, 2002). Assessment of

patient's perception of activity restriction may reveal areas for intervention. For example,

patients may believe they need to conserve energy or fear that certain activities may

cause disability to worsen. Challenging these thoughts through safe behavioral

experiments can serve to disprove exaggerated perceptions of activity restriction, thereby

facilitating engagement in pleasant events.

Older adults with less education reported greater depressive symptoms and lower

meaning in life and positive affect. Similar results have been found in past studies (e.g.,

Roberts, Shema, Kaplan, & Strawbridge, 2014); however, a recent meta-analysis did not

find education to be a significant risk factor for depression among older adults (Cole &

Dendukuri, 2014). The current study design does not allow for examination of the

association between education and affective outcomes over time, possible third variables,

such as socioeconomic status, could explain the findings and present an area for future

research.

Limitations

Several limitations of the current study are noted. First, the study is cross-

sectional, which does not allow for examining directionality of relations among variables

needed to strongly test mediation. Second, measurement of positive reinforcement relied

on retrospective self-report measure of pleasant events, which serves as a proxy measure

and may be subject to recall bias, as well as bias reporting due to mood symptoms. In

addition, the OPPES has a restricted number of response choices for pleasantness ratings.

A scale with more response choices may have captured greater variability in pleasantness

ratings, potentially influencing findings. Future research that measures pleasantness

ratings with a greater number of response choices is needed. Nonetheless, the results are

consistent with past research findings in regards to the contribution of pleasantness

ratings (Lewinsohn & Libet, 1972; O'Hara & Rehm, 1979), including one study that

utilized daily diary methodology (Hopko & Mullane, 2008).).

      Third, the sample consisted of generally healthy older adults characterized by low

depressive symptoms and low disability. Findings may not generalize to more disabled

older adults and/or older adults with clinically significant symptoms of depression, or

depression diagnosis. Similarly, the sample consisted of a majority White and educated

sample of adults, limiting generalizability of the findings.

Future Directions

      An important direction for future research is examining relations between

physical disability, engagement in pleasant events, and mood over time, in order to

determine whether engagement in pleasant events precedes mood changes. While

Lewinsohn (1974) hypothesized that decreased positive reinforcement preceded mood

changes, this has yet to be empirically supported (Dimidjian et al., 2011). Lewisohn and

Lisbet (1974) and Rehm (1978) failed to demonstrate significant correlations between

mood and subsequent activity level, or activity level and subsequent mood. Mausbach

and colleagues (2008) examined activity levels and mood across a single day among

caregivers of individuals with Alzheimer's disease, using daily dairy methods. In contrast

to the behavioral model of depression, there was a positive, non-significant association

between activity level and subsequent positive affect ($r = .09$) and a negative, non-

significant association between total activity and negative affect ($r = -.07$). Lagged

associations between mood and subsequent activity level were also non-significant,

indicating weak evidence for temporal associations between activity and mood, at least

within the same day. Given the efficacy of behavior therapy for depression (Scogin et al.,

2005), one would predict a bi-directional relation between engagement in pleasant events

and mood over time. Future studies using longitudinal cross-lagged designs would

provide answers to these questions by accounting for the autoregressive paths (i.e., T1

activity predicting T2 activity) and cross-lagged paths (e.g., T1 activity predicting T2

mood). In addition, it is important to examine relations among variables among older

adults diagnosed with depression, as relations among variables may differ compared to

non-depressed older adults. One might expect more robust mediation effect among

clinically depressed samples.

In addition to measuring activity and mood using longitudinal designs, daily diary

studies provide a way to examine the temporal order of events and more directly measure

positive reinforcement in "real time" (Hopko et al., 2003; Hopko & Mullane, 2008).

Daily dairy studies are a type of ecological momentary assessment that ask participants to

record events at specified times typically daily or multiple times per day for a certain

period. Diary studies are a useful addition to self-report questionnaires for several

reasons. First, unlike the PES (MacPhillamy & Lewinsohn, 1974), which relies on

retrospective reports of pleasant events, diary studies have participants record the reward

value associated with the activity close to when the activity occurs, thereby more closely

approximating positive reinforcement. Second, diary studies reduce demand

characteristics that may arise from providing participants a pre-specified list of pleasant

events to monitor, which could inflate frequency of engagement because participants feel committed to following through with activities (Hopko et al., 2003). So far, research examining overt behavior and mood with daily dairies has provided useful information for understanding differences in pleasant events among depressed and non-depressed adults (Hopko et al., 2003), as well as the association between type of event and mood (Hopko & Mullane, 2008). In addition, daily diary studies have been applied to the examination of the association between pleasant events and mood among dementia caregivers (Mausbach et al., 2008).

Another important area for future research is examining whether type of activity is associated with mood. Based on the behavioral model of depression, individuals with depression should theoretically engage in more passive (e.g., television watching), sedentary (e.g., napping), or avoidant behaviors (e.g., computer solitary) and less in social and physical activities (Hopko & Mullane, 2008). Hopko and Mullane (2008) tested this question among undergraduate college students who they classified as non-depressed (1 standard deviation below *M* BDI score) or mildly depressed (1 standard deviation above *M* BDI), across an 8-day period. Using daily diaries, they found that mildly depressed individuals engaged in more employment-related activities and less social, physical, educational activities. Based on these type of research, future studies could test 1) whether depression severity (none, mild, moderate, severe) is associated with certain types of activities among older adults with disability; 2) differences in type of activity based on severity of disability (none, mild, moderate, severe); and 3) whether type of activity varied by disability and depression severity status (e.g., mild disability-low depression; mild-disability-moderate depression). Results could provide valuable

information regarding whether type of activity differs based on disability and/or depression severity level, which could inform interventions to better target frequency and type of activities.

Given that the current findings and past findings demonstrated a stronger association between engagement in pleasant events and positive affect compared to negative affect (Lawton, 1996; Mausbach et al., 2008; Mausbach et al., 2011), one mechanism underlying behavior therapy may be changes in positive affect. Such an effect could be thought of as the reverse of the "downward spiral" of activity and mood, such that greater engagement in pleasant events leads to subsequent changes in positive affect, which increases subsequent positive affect and engagement in pleasant events. Such questions could be examined among older adults with physical disability, to better understand mechanisms underlying behavioral therapy. It has also been speculated that perhaps positive reinforcement exerts greater influence on positive affect, while cognitions exert stronger effects on depressive symptoms and negative affect (Mausbach et al., 2008). Measurement of cognitive distortions and other negative beliefs would provide a way to empirically test this supposition, as well as disentangle the likely reciprocal relation between behavior and cognition, among older adults with physical disability.

Another interesting area for future research is exploring the role of avoidance in the association between physical disability and affective outcomes. Within the context of disability, avoidance may function in different ways. First, avoidance may function to relieve internal or external distress, as proposed by the behavioral model of depression (Lewinsohn, 1974). One example would be an older adult who sleeps most of the day to

escape depressed mood. Second, avoidance may also be related to disability. For example, an older adult with gait and balance issues may avoid using a wheeled walker because of fear of falling, severely limiting activity participation and potential contact with positive reinforcement. Both functions of avoidance within the context of disability and depressed mood may serve to reduce contact with positive reinforcement fostering depressive symptoms. A critical next step is to examine to what extent avoidance occurs among older adults with physical disability and whether avoidance accounts for the robust connection between physical disability and depressive symptoms in older adults. Past research suggests that engagement in pleasant events may account for the relation between greater avoidance behaviors and depressive symptoms (Carvalho & Hopko, 2011). Among undergraduate students, engagement in pleasant events mediated the association between both cognitive avoidance and behavioral avoidance and depressive symptoms, after controlling for anxiety (Carvalho & Hopko, 2011). Testing similar models with older adults with physical disability would provide a better understanding of the role of avoidance in depressive symptoms, as well as the connection between avoidance and pleasant events in relation to depression symptoms.

In addition to avoidance, other factors should be examined as potential mediating variables. In the current study, physical disability was associated with lower perceived social support, and social support was associated with greater depressive symptoms. Past research has been mixed regarding the positive and negative effect of social support on affective outcomes (Lin & Wu, 201; Taylor & Lynch, 2004, Yang, 2006). It is plausible that individuals in an older adult's social network could function to aid in engaging in pleasant events, in turn, potentially decreasing depressive symptoms and increasing

positive affect and meaning in life (Taylor & Lynch, 2004, Yang, 2006). However, previous findings also suggest that receipt of social support is associated with subsequent increases in depressive symptoms (Lin & Wu, 2011). Future studies should examine whether different forms of social support (e.g., emotional, instrumental) account for the association between disability and affective outcomes, to better understand its role.

Future research should also consider the nature of physical disability. Physical disability is associated with varying recovery projections (Boyd et al., 2008), which should be considered when examining the association between engagement in pleasant events and mood. For example, positive reinforcement may drop off steeply after a hip fracture, however, the window of activity restriction may be less depending on the potential for rehabilitation. Understanding the nature of the disability can be useful in informing research questions, such as examining the natural change in activity level following onset of disability and determining whether differences in functional and psychological outcomes emerge based on changes in level of engagement in pleasant events over time.

The final and most extensive area for future research involves the measurement of study variables. The measurement of positive reinforcement using self-report questionnaires is inherently problematic given the definition of reinforcement: "positive reinforcement is the change in rate of behavior over time contingent upon the presentation of certain stimuli (Manos et al., 2010, p. 551)." However, measuring positive reinforcement using functional analytic measures is incredibly challenging outside of single subject methods. Group designs, which are desirable for testing mediation on a large scale, do not allow for the careful control of the environment and long observation

periods needed to capture change in behavior. Due to these challenges, researchers have

relied on proxy self-report measures to capture positive reinforcement. The current study

selected a widely researched self-report measure of pleasant events adapted for older

adults, The Older Persons' Pleasant Event Schedule (Teri & Lewinsohn, 1982). The

OPPES purports to measure positive reinforcement through assessing the frequency of

pleasant events and pleasantness ratings. The OPPES assumes that measurement of

frequency of pleasant events and pleasantness ratings for events provides evidence of

positive reinforcement in the environment; however, it is possible that pleasant events

may or may not actually be serving the function of positive reinforcement. For example,

it is possible for pleasant events to serve as avoidance or have delayed aversive

consequences (e.g., watching a movie to avoid housework; Perone, 2003). More recent

conceptualizations of the theory underlying behavioral activation therapy for depression

have emphasized the need to measure the function of behavior, particularly whether

behavior is functioning as positive or negative reinforcement (Martell et al., 2001). The

emphasis placed on assessing the function of behavior in theoretical writings of behavior

therapy has spurred the creation of self-report measures to capture the functionality of

behavior, including the Behavioral Activation For Depression Scale (BADS; Kanter et

al., 2007), the Environmental Reward Observation Scale (EROS; Armento & Hopko,

2007), and the Reward Probability Index (RPI; Carvalho et al., 2011). The inclusion of

more recently developed self-report measures, combined with diary studies, would be

beneficial in future research to best approximate reinforcement.

Conclusion

At some point in life, most adults will experience some type of physical disability, which most often occurs in late life. While physical disability increases risk for depression, many older adults do not become depressed. The current study found that engagement in pleasant events accounts for the association between physical disability and affective outcomes in older adults. Findings suggest that behavioral disengagement is one potential mechanism linking physical disability and affective outcomes, which requires future, longitudinal study.

Footnote

[1] Research category to denote depression that does not meet threshold criteria for minor

depression, MDD, or dysthymia (Judd, Akiskal, & Paulus, 1997).

References

Alexopoulos, G. S., Kiosses, D. N., Klimstra, S., Kalayam, B., & Bruce, M. L. (2002). Clinical presentation of the" depression-executive dysfunction syndrome" of late life. *American Journal of Geriatric Psychology*, *10*, 98-106.

Alloy, L. B., Abramson, L. Y., Whitehouse, W. G., Hogan, M. E., Panzarella, C., & Rose, D. T. (2006). Prospective incidence of first onsets and recurrences of depression in individuals at high and low cognitive risk for depression. *Journal of Abnormal Psychology*, *115*, 145-156.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author.

Anstey, K. J., von Sanden, C., Sargent-Cox, K., & Luszcz, M. A. (2007). Prevalence and risk factors for depression in a longitudinal, population-based study including individuals in the community and residential care. *American Journal of Geriatric Psychology*, *15*, 497-505.

Armento, M. E., & Hopko, D. R. (2007). The environmental reward observation scale (EROS): development, validity, and reliability. *Behavior Therapy*, *38*(2), 107-119.

Bamonti, P.M., Fiske, A. (in progress). Mediators and Moderators of the Disability-Depression Relation: Critical Review of the Literature.

Beekman, A. T., Deeg, D. J., van Tilburg, T., Smit, J. H., Hooijer, C., & van Tilburg, W. (1995). Major and minor depression in later life: a study of prevalence and risk factors. *Journal of Affective Disorders*, *36*, 65-75.

Black, B. S., Rabins, P. V., & German, P. S. (1999). Predictors of nursing home placement among elderly public housing residents. *The Gerontologist*, *39*, 559-568.

Blazer, D. G. (2003). Depression in late life: review and commentary. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *58*, M249-M265.

Boerner, K. (2004). Adaptation to disability among middle-aged and older adults: The role of assimilative and accommodative coping. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 59*, P35-P42.

Boyd, C. M., Landefeld, C. S., Counsell, S. R., Palmer, R. M., Fortinsky, R. H., Kresevic, D., ... & Covinsky, K. E. (2008). Recovery of activities of daily living in older adults after hospitalization for acute medical illness. *Journal of the American Geriatrics Society*, *56*(12), 2171-2179.

Brown, G. K., Beck, A. T., Steer, R. A., & Grisham, J. R. (2000). Risk factors for suicide in psychiatric outpatients: a 20-year prospective study. *Journal of Consulting and Clinical Psychology*, *68*, 371-377.

Brown, T. A., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology*, *107*, 179-192.

Brown, L. M., & Schinka, J. A. (2005). Development and initial validation of a 15- item informant version of the Geriatric Depression Scale. *International Journal of Geriatric Psychiatry*, *20*, 911-918.

Bruce, M. L. (2001). Depression and disability in late life: directions for future research. *American Journal of Geriatric Psychology*, *9*, 102-112.

Bruce, M. L., & Leaf, P. J. (1989). Psychiatric disorders and 15-month mortality in a community sample of older adults. *American Journal of Public Health*, *79*, 727-730.

Butters, M. A., Young, J. B., Lopez, O., Aizenstein, H. J., Mulsant, B. H., Reynolds III, C. F., ... & Becker, J. T. (2008). Pathways linking late-life depression to persistent cognitive impairment and dementia. *Dialogues in Clinical Neuroscience*, *10*, 345-357.

Carvalho, J. P., Gawrysiak, M. J., Hellmuth, J. C., McNulty, J. K., Magidson, J. F., Lejuez, C. W., & Hopko, D. R. (2011). The reward probability index: design and validation of a scale measuring access to environmental reward. *Behavior Therapy*, *42*(2), 249-262.

Carvalho, J. P., & Hopko, D. R. (2011). Behavioral theory of depression: Reinforcement as a mediating variable between avoidance and depression. *Journal of Behavior Therapy and Experimental Psychiatry*, *42*(2), 154-162.

Chiang, K. S., Green, K. E., & Cox, E. O. (2009). Rasch Analysis of the Geriatric Depression Scale–Short Form. *The Gerontologist*, *49*, 262-275.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge Academic.

Cohen, S., & Hoberman, H. M. (1983). Positive Events and Social Supports as Buffers of Life Change Stress1. *Journal of Applied Social Psychology*, *13*, 99-125.

Cole, M. G., & Dendukuri, N. (2003). Risk factors for depression among elderly

     community subjects: a systematic review and meta-analysis. *American Journal of*

     Psychiatry, *160*, 1147-1156.

Conwell, Y., Duberstein, P. R., & Caine, E. D. (2002). Risk factors for suicide in later

     life. *Biological Psychiatry*, *52*, 193-204.

Cuijpers, P., Van Straten, A., & Warmerdam, L. (2007). Behavioral activation treatments

     of depression: A meta-analysis. *Clinical Psychology Review*, *27*, 318-326.

Dimidjian, S., Barrera Jr, M., Martell, C., Muñoz, R. F., & Lewinsohn, P. M. (2011). The

     origins and current status of behavioral activation treatments for depression.

     Annual Review of Clinical Psychology, *7*, 1-38.

Dimidjian, S., Hollon, S. D., Dobson, K. S., Schmaling, K. B., Kohlenberg, R. J., Addis,

     M. E., ... & Jacobson, N. S. (2006). Randomized trial of behavioral activation,

     cognitive therapy, and antidepressant medication in the acute treatment of adults

     with major depression. *Journal of Consulting and Clinical Psychology*, *74*, 658.

Djernes, J. K. (2006). Prevalence and predictors of depression in populations of elderly: a

     review. *Acta Psychiatrica Scandinavica*, *113*, 372-387.

Duke, J., Leventhal, H., Brownlee, S., & Leventhal, E. A. (2002). Giving up and

     replacing activities in response to illness. *The Journals of Gerontology Series B:*

     Psychological Sciences and Social Sciences, *57*, P367-P376.

Dunne, E., Wrosch, C., & Miller, G. E. (2011). Goal disengagement, functional

     disability, and depressive symptoms in old age. *Health Psychology*, *30*, 763-770.

Eakman, A. M., Carlson, M. E., & Clark, F. A. (2010). The meaningful activity

     participation assessment: A measure of engagement in personally valued

activities. *The International Journal of Aging and Human Development*, *70*, 299-317.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*, 272-299.

Ferster, C. B. (1966). Animal behavior and mental illness. *The Psychological Record, 16*, 345-356.

Ferster, C. B. (1973). A functional analysis of depression. *American Psychologist, 28*, 857-870.

Fiske, A., Bamonti, P.M., Nadorff, M.R., Petts, R., Sperry, J.A. (2013). Control Strategies and Suicidal Ideation in Older Adults with Functional Limitations. *International Journal of Psychiatry in Medicine, 46,* 271-289.

Fiske, A., Wetherell, J. L., & Gatz, M. (2009). Depression in older adults. *Annual Review of Clinical Psychology*, *5*, 363-389.

Friedman, B., Heisel, M. J., & Delavan, R. L. (2005). Psychometric Properties of the 15- Item Geriatric Depression Scale in Functionally Impaired, Cognitively Intact, Community- Dwelling Elderly Primary Care Patients. *Journal of the American Geriatrics Society*, *53*, 1570-1576.

Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, *18*, 233-239.

Gallo, J. J., & Rabins, P. V. (1999). Depression without sadness: alternative presentations of depression in late life. *American Family Physician*, *60*, 820-826.

Gortner, E. T., Gollan, J. K., Dobson, K. S., & Jacobson, N. S. (1998). Cognitive-
behavioral treatment for depression: Relapse prevention. *Journal of Consulting
and Clinical Psychology*, *66*, 377-384.

Greenberg, P. E., Kessler, R. C., Birnbaum, H. G., Leong, S. A., Lowe, S. W., Berglund,
P. A., & Corey-Lisle, P. K. (2003). The economic burden of depression in the
United States: how did it change between 1990 and 2000?. *Journal of clinical
Psychiatry*, *64*, 1465-1475.

Hall, N. C., Chipperfield, J. G., Heckhausen, J., & Perry, R. P. (2010). Control striving in
older adults with serious health problems: A 9-year longitudinal study of survival,
health, and well-being. *Psychology and Aging, 25*, 432.

Han, B. (2002). Depressive Symptoms and Self- Rated Health in Community- Dwelling
Older Adults: A Longitudinal Study. *Journal of the American Geriatrics Society*,
50, 1549-1556.

Hankin, B. L., Oppenheimer, C., Jenness, J., Barrocas, A., Shapero, B. G., & Goldband,
J. (2009). Developmental origins of cognitive vulnerabilities to depression:
Review of processes contributing to stability and change across time. *Journal of
Clinical Psychology*, *65*, 1327-1338.

Haringsma, R., Engels, G. I., Cuijpers, P., & Spinhoven, P. (2006). Effectiveness of the
Coping With Depression (CWD) course for older adults provided by the
community-based mental health care system in the Netherlands: a randomized
controlled field trial. *International Psychogeriatrics*, *18*, 307-326.

Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span
development. *Psychological Review*, *117*, 32-60.

Heisel, M. J., & Flett, G. L. (2006). The development and initial validation of the
Geriatric Suicide Ideation Scale. *American Journal of Geriatric Psychiatry*, *14*,
742-751.

Heisel, M. J., & Flett, G. L. (2008). Psychological resilience to suicide ideation among
older adults. *Clinical Gerontologist: The Journal Of Aging And Mental Health*,
31, 51-70.

Hilsman, R., & Garber, J. (1995). A test of the cognitive diathesis-stress model of
depression in children: Academic stressors, attributional style, perceived
competence, and control. *Journal of Personality and Social Psychology*, *69*, 370-
380.

Hopko, D. R., Armento, M. E., Cantu, M. S., Chambers, L. L., & Lejuez, C. W. (2003).
The use of daily diaries to assess the relations among mood state, overt behavior,
and reward value of activities. *Behaviour Research and Therapy*, *41*, 1137-1148.

Hopko, D. R., Lejuez, C. W., Lepage, J. P., Hopko, S. D., & McNeil, D. W. (2003). A
Brief Behavioral Activation Treatment for Depression A Randomized Pilot Trial
within an Inpatient Psychiatric Hospital. *Behavior Modification*, *27*, 458-469.

Hopko, D. R., Lejuez, C. W., Ruggiero, K. J., & Eifert, G. H. (2003). Contemporary
behavioral activation treatments for depression: Procedures, principles, and
progress. *Clinical Psychology Review*, *23*, 699-717.

Hopko, D. R., & Mullane, C. M. (2008). Exploring the relation of depression and overt
behavior with daily diaries. *Behaviour Research and Therapy*, *46*, 1085-1089.

IBM Corp. (2012). IBM SPSS statistics for Macintosh, version 21.0. Armonk, NY:
Author.

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-

seven community studies. *Journal of Health and Social Behavior*, 21-37.

Jenkinson, C., Wright, L., & Coulter, A. (1994). Criterion validity and reliability of the

SF-36 in a population sample. *Quality of Life Research*, *3*, 7-12.

Jacobson, N. S., Martell, C. R., & Dimidjian, S. (2001). Behavioral activation treatment

for depression: Returning to contextual roots. *Clinical Psychology: Science and

Practice*, *8*, 255-270.

Jette, A. M. (2006). Toward a common language for function, disability, and health.

Physical Therapy, *86*, 726-734.

Judd, L. L., Akiskal, H. S., & Paulus, M. P. (1997). The role and clinical significance of

subsyndromal depressive symptoms (SSD) in unipolar major depressive disorder.

Journal of Affective Disorders, *45*, 5-18.

Kanter, J. W., Mulick, P. S., Busch, A. M., Berlin, K. S., & Martell, C. R. (2007). The

Behavioral Activation for Depression Scale (BADS): psychometric properties and

factor structure. *Journal of Psychopathology and Behavioral Assessment, 29*, 191-

202.

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies

of illness in the aged: the index of ADL: a standardized measure of biological and

psychosocial function. *The Journal of the American Medical Association*, *185*,

914-919.

Kennedy, G. J., Kelman, H. R., & Thomas, C. (1990). The emergence of depressive

symptoms in late life: the importance of declining health and increasing disability.

Journal of Community Health, *15*, 93-104.

Kiosses, D. N., Teri, L., Velligan, D. I., & Alexopoulos, G. S. (2011). A home-delivered

    intervention for depressed, cognitively impaired, disabled elders. *International*

    Journal of Geriatric Psychiatry, *26*(3), 256-262.

Koenig, H. G., Meador, K. G., Cohen, H. J., & Blazer, D. G. (1988). Depression in

    elderly hospitalized patients with medical illness. *Archives of Internal Medicine*,

    148, 1929-1936.

Koenig, H. G., Westlund, R. E., George, L. K., Hughes, D. C., Blazer, D. G., & Hybels,

    C. (1993). Abbreviating the Duke Social Support Index for use in chronically ill

    elderly individuals. *Psychosomatics*, *34*, 61-69.

Köhler, S., Verhey, F., Weyerer, S., Wiese, B., Heser, K., Wagner, M., ... & Maier, W.

    (2013). Depression, non-fatal stroke and all-cause mortality in old age: A

    prospective cohort study of primary care patients. *Journal of Affective Disorders*,

    150, 63-69.

Landerman, R., George, L. K., Campbell, R. T., & Blazer, D. G. (1989). Alternative

    models of the stress buffering hypothesis. *American Journal of Community*

    Psychology, *17*, 625-642.

Lawton, M. P. (1996). Quality of life and affect in later life. In C. Magai & S. H.

    McFadden (Eds.), *Handbook of emotion, adult development and aging* (pp. 327–

    348). San Diego, CA: Academic Press.

Lawton, M.P., & Brody, E.M. Assessment of older people: self-maintaining and

    instrumental activities of daily living. *Gerontologist, 9*, 179-186.

Lawton, M. P., Kleban, M. H., Dean, J., Rajagopal, D., & Parmelee, P. A. (1992). The
      factorial generality of brief positive and negative affect measures. *Journal of
      Gerontology*, *47*, P228-P237.

Lawton, M. P., Parmelee, P. A., Katz, I. R., & Nesselroade, J. (1996). Affective states in
      normal and depressed older people. *The Journals of Gerontology Series B:
      Psychological Sciences and Social Sciences*, *51*, P309-P316.

Lewinsohn, P. M. (1974). A behavioral approach to depression. In R. M. Friedman, & M.
      M. Katz (Eds.), *The psychology of depression: Contemporary theory and
      research*. New York: Wiley.

Lewinsohn, P. M., & Graf, M. (1973). Pleasant activities and depression. *Journal of
      Consulting and Clinical Psychology, 41*, 261–268.

Lewinsohn, P.M., Hoberman, H., Teri, L., & Hautzinger, M. (1985). An integrative
      theory of depression. In S. Reiss, & R.R. Bootzin (Eds.), *Theoretical issues in
      behavior therapy*. New York Academic Press.

Lewinsohn, P. M., & Libet, J. (1972). Pleasant events, activity schedules, and
      depressions. *Journal of Abnormal Psychology*, *79*, 291.

Lewinsohn, P. M., Munoz, R. F., Youngren, M. A., & Zeiss, A. M. (1986). *Control your
      depression*. New York: Prentice Hall.

Lewinsohn, P.M., Youngren, M.A., & Grosscup, S.J. (1979). Reinforcement and depres-
      sion. In R.A. DePue (Ed.), *The psychobiology of depressive disorders*:
      Implications for the effects of stress. New York Academic Press.

Lin, I., & Wu, H. (2011). Does informal care attenuate the cycle of ADL/IADL disability and depressive symptoms in late life? The *Journals Of Gerontology: Series B: Psychological Sciences And Social Sciences, 66B*, 585-594.

Luber, M. P., Meyers, B. S., Williams-Russo, P. G., Hollenberg, J. P., DiDomenico, T. N., Charlson, M. E., & Alexopoulos, G. S. (2001). Depression and service utilization in elderly primary care patients. *The American Journal of Geriatric Psychiatry*, *9*, 169-176.

Lejuez, C. W., Hopko, D. R., & Hopko, S. D. (2001). A brief behavioral activation treatment for depression treatment manual. *Behavior Modification*, *25*, 255-286.

Lewinsohn PM. (1974). A behavioral approach to depression. In R.J. Friedman, & M.M. Katz (Eds.), *The Psychology of Depression: Contemporary Theory and Research*. New York: Wiley

Lewinsohn, P.M., Hoberman, H., Teri, L., & Hautzinger, M. (1985). An integrative theory of depression. In S. Reiss, & R.R. Bootzin (Eds.), *Theoretical issues in behavior therapy*. New York: Academic Press.

Lewinsohn, P. M., & Libet, J. (1972). Pleasant events, activity schedules, and depressions. *Journal Of Abnormal Psychology, 79*, 291-295.

Lichtenberg, P. A., Kimbarow, M. L., Morris, P., & Vangel Jr, S. J. (1996). Behavioral treatment of depression in predominantly African-American medical patients. *Clinical Gerontologist*, *17*, 15-33.

Lyness, J. M., Caine, E. D., King, D. A., Conwell, Y., Duberstein, P. R., & Cox, C. (2002). Depressive disorders and symptoms in older primary care patients: one-year outcomes. *American Journal of Geriatric Psych*, *10*, 275-282.

MacPhillamy, D. J., & Lewinsohn, P. M. (1974). Depression as a function of levels of

    desired and obtained pleasure. *Journal of Abnormal Psychology*, *83*, 651.

Manos, R. C., Kanter, J. W., & Busch, A. M. (2010). A critical review of assessment

    strategies to measure the behavioral activation model of depression. *Clinical

    Psychology Review*, *30*(5), 547-561.

Martell, C. R., Addis, M. E., & Jacobson, N. S. (2001). *Depression in context: Strategies

    for guided action*. WW Norton & Co.

Mausbach, B. T., Coon, D. W., Patterson, T. L., & Grant, I. (2008). Engagement in

    activities is associated with affective arousal in Alzheimer's caregivers: A

    preliminary examination of the temporal relations between activity and affect.

    Behavior Therapy, *39*, 366-374.

Mausbach, B. T., Roepke, S. K., Depp, C. A., Moore, R., Patterson, T. L., & Grant, I.

    (2011). Integration of the pleasant events and activity restriction models:

    Development and validation of a "PEAR" model of negative outcomes in

    Alzheimer's caregivers. *Behavior Therapy, 42*, 78-88.

MacPhillamy, D. J., & Lewinsohn, P. M. (1982). The Pleasant Events Schedule: Studies

    on reliability, validity, and scale intercorrelation. *Journal of Consulting and

    Clinical Psychology, 50*, 363−380.

Meeks, S., & Depp, C. A. (2003). Pleasant events-based behavioral intervention for

    depression in nursing home residents: A conceptual and empirical foundation.

    Clinical Gerontologist, *25*, 125-148.

Meeks, S., Looney, S. W., Van Haitsma, K., & Teri, L. (2008). BE-ACTIV: a staff-assisted behavioral intervention for depression in nursing homes. *The Gerontologist, 48*, 105-114.

Meeks, S., Shah, S. N., & Ramsey, S. K. (2009). The Pleasant Events Schedule–Nursing Home Version: A useful tool for behavioral interventions in long-term care. *Aging and Mental Health*, *13*, 445-455.

Meeks, T. W., Vahia, I. V., Lavretsky, H., Kulkarni, G., & Jeste, D. V. (2011). A tune in "a minor" can "b major": a review of epidemiology, illness course, and public health implications of subthreshold depression in older adults. *Journal of Affective Disorders*, *129*, 126-142.

Meijer, A., Conradi, H. J., Bos, E. H., Thombs, B. D., van Melle, J. P., & de Jonge, P. (2011). Prognostic association of depression following myocardial infarction with mortality and cardiovascular events: a meta-analysis of 25 years of research. *General Hospital Psychiatry*, *33*, 203-216.

Mitchell, A. J., Bird, V., Rizzo, M., & Meader, N. (2010). Diagnostic validity and added value of the Geriatric Depression Scale for depression in primary care: a meta-analysis of GDS30 and GDS15. *Journal of Affective Disorders*, *125*, 10-17.

Morris, N. S., MacLean, C. D., Chew, L. D., & Littenberg, B. (2006). The Single Item Literacy Screener: evaluation of a brief instrument to identify limited reading ability. *BMC Family Practice, 7*, 21.

Murray, C. J., & Lopez, A. D. (1997). Mortality by cause for eight regions of the world: Global Burden of Disease Study. *The Lancet*, *349*, 1269-1276.

Nagi, S. Z. (1991). Disability concepts revisited: implications for prevention. *Disability in America: Toward a national agenda for prevention*, 309-327.

Newsom, J.T., & Schulz, T. (1996). Social support as a mediator in the relation between functional status and quality of life in older adults. *Psychology and Aging, 11*, 34-44.

O'Hara, M. W., & Rehm, L. P. (1979). Self-Monitoring, Activity Levels, and Mood in the Development and Maintenance of Depression. *Journal Of Abnormal Psychology, 88*, 450-453.

Okura, Y., Urban, L. H., Mahoney, D. W., Jacobsen, S. J., & Rodeheffer, R. J. (2004). Agreement between self-report questionnaires and medical record data was substantial for diabetes, hypertension, myocardial infarction and stroke but not for heart failure. *Journal of Clinical Epidemiology*, *57*(10), 1096-1103.

Ormel, J., Rijsdijk, F. V., Sullivan, M., van Sonderen, E., & Kempen, G. I. (2002). Temporal and reciprocal relationship between IADL/ADL disability and depressive symptoms in late life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *57*, P338-P347.

Park, M., Katon, W. J., & Wolf, F. M. (2013). Depression and risk of mortality in individuals with diabetes: a meta-analysis and systematic review. *General Hospital Psychiatry*, *35*, 217-225.

Parmelee, P. A., Katz, I. R., & Lawton, M. P. (1989). Depression among institutionalized aged: assessment and prevalence estimation. *Journal of Gerontology*, *44*, M22-M29.

Pedraza, O., Dotson, V. M., Willis, F. B., Graff-Radford, N. R., & Lucas, J. A. (2009). Internal consistency and test-retest stability of the Geriatric Depression Scale-Short Form in African American older adults. *Journal of Psychopathology and Behavioral Assessment*, *31*, 412-416.

Penninx, B. W., Beekman, A. T., Honig, A., Deeg, D. J., Schoevers, R. A., van Eijk, J., & van Tilburg, W. (2001). Depression and cardiac mortality: results from a community-based longitudinal study. *Archives of General Psychiatry*, *58*, 221-227.

Penninx, B. W., Geerlings, S. W., Deeg, D. J., van Eijk, J., van Tilburg, W., & Beekman, A. T. (1999). Minor and major depression and the risk of death in older persons. *Archives of General Psychiatry*, *56*, 889-895.

Perone, M. (2003). Negative effects of positive reinforcement. *The Behavior Analyst*, *26*(1), 1-14.

Persons, J. B., & Rao, P. A. (1985). Longitudinal study of cognitions, life events, and depression in psychiatric inpatients. *Journal of Abnormal Psychology*, *94*, 51-63.

Pinquart, M., & Duberstein, P. R. (2010). Depression and cancer mortality: a meta-analysis. *Psychological Medicine*, *40*, 1797-1810.

Powers, J. R., Goodger, B., & Byles, J. E. (2004). Assessment of the abbreviated Duke Social Support Index in a cohort of older Australian women. *Australasian Journal on Ageing*, *23*, 71-76.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.

Prince, M. J., Harwood, R. H., Thomas, A., & Mann, A. H. (1998). A prospective population-based cohort study of the effects of disablement and social milieu on the onset and maintenance of late-life depression. The Gospel Oak Project VII. *Psychological Medicine*, *28*, 337-350.

Rehm, L. P. (1978). Mood, pleasant events, and unpleasant events: Two pilot studies. *Journal of Consulting and Clinical Psychology*, *46*(5), 854-859.

Roberts, R. E., Shema, S. J., Kaplan, G. A., & Strawbridge, W. J. (2014). Sleep complaints and depression in an aging cohort: a prospective perspective. *American Journal of Psychiatry, 157*, 81-88.

Schulberg, H. C., Mulsant, B., Schulz, R., Rollman, B. L., Houck, P. R., & Reynolds, C. F. (1998). Characteristics and course of major depression in older primary care patients. *The International Journal of Psychiatry in Medicine*, *28*, 421-436.

Scogin, F., Welsh, D., Hanson, A., Stump, J., & Coates, A. (2005). Evidence- Based Psychotherapies for Depression in Older Adults. *Clinical Psychology: Science and Practice*, *12*, 222-237.

Seidlitz, L., Lyness, J. M., Conwell, Y., Duberstein, P. R., & Cox, C. (2001). Profile of discrete emotions in affective disorders in older primary care patients. *The Gerontologist*, *41*, 643-651.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, *7*, 422-445.

Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well- being and alleviating

    depressive symptoms with positive psychology interventions: A

    practice- friendly meta- analysis. *Journal of Clinical Psychology*, *65*, 467-487.

Snarski, M., Scogin, F., DiNapoli, E., Presnell, A., McAlpine, J., & Marcinak, J. (2011).

    The effects of behavioral activation therapy with inpatient geriatric psychiatry

    patients. *Behavior Therapy*, *42*, 100-108.

Spector, W. D., & Fleishman, J. A. (1998). Combining activities of daily living with

    instrumental activities of daily living to measure functional disability. *The*

    Journals of Gerontology Series B: Psychological Sciences and Social Sciences,

    53, S46-S57.

Tabachnick, B. G., & Fidell, L. S. (2007). Using multivariate statistics. pp. 5-7, 11-12,

    27-49, 62-72, & 441-444. Boston, MA: Pearson Education, Inc.

Taylor, M.G., & Lynch, S.M. (2004). Trajectories of impairment, social support, and

    depressive symptoms in late life. *Journal of Gerontology: Social Sciences, 59B*,

    S238-S246.

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), 1063-1070.

Teri, L., & Lewinsohn, P. M. (1982). Modification of the Pleasant and Unpleasant Events

    Schedules for use with the elderly. *Journal of Consulting and Clinical*

    Psychology, *50*, 444.

Thompson, L. W., & Gallagher, D. (1984). Efficacy of psychotherapy in the treatment of

    late-life depression. *Advances in Behaviour Research & Therapy*, *6*, 127-139.

Truax, P. A., Addis, M. E., Koerner, K., Gollan, J. K., Gortner, E., & Prince, S. E. (1996). A component analysis of cognitive-behavioral treatment for depression. *Journal or Consulting and ClinicaJ Psychology*, *64*, 295-304.

Turk, D. C., & Okifuji, A. (2002). Psychological factors in chronic pain: evolution and revolution. *Journal of Consulting and Clinical Psychology, 70*, 678-690.

Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner Jr, T. E. (2012). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric properties of the Interpersonal Needs Questionnaire. *Psychological Assessment*, *24*, 197-215.

Verbrugge, L. M., & Jette, A. M. (1994). The disablement process. *Social Science & Medicine*, *38*, 1-14.

Wahl, H. W., Becker, S., Burmedi, D., & Schilling, O. (2004). The role of primary and secondary control in adaptation to age-related vision loss: a study of older adults with macular degeneration. *Psychology and Aging, 19*, 235-239.

Wancata, J., Alexandrowicz, R., Marquart, B., Weiss, M., & Friedrich, F. (2006). The criterion validity of the Geriatric Depression Scale: A systematic review. *Acta Psychiatrica Scandinavica*, *114*, 398-410.

Ware Jr, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care*, 473-483.

Warr, P., Butcher, V., & Robertson, I. (2004). Activity and psychological well-being in older people. *Aging & Mental Health*, *8*, 172-183.

Williamson, G. M. (1998). The central role of restricted normal activities in adjustment to illness and disability: A model of depressed affect. *Rehabilitation Psychology, 43*, 327-347.

Williamson, G.M. (2000). Pain, Functional Disability, and Depressed Affect. In G.M. Williamson, D.R. Shaffer & P.A. Parmelee (Eds.). *Physical illness and depression in older adults: a handbook of theory, research, and practice.* New York: Plenum Publishing.

Williamson, G.M., & Shaffer, D.R. (2000). The Activity Restriction Model of Depressed Affect: antecedents and consequences of restricted normal activities. In G.M. Williamson, D.R. Shaffer & P.A. Parmelee (Eds.). *Physical illness and depression in older adults: a handbook of theory, research, and practice.* New York: Plenum Publishing.

Williamson, G. M., & Schulz, R. (1992). Pain, activity restriction, and symptoms of depression among community-residing elderly adults. *Journal of Gerontology*, *47*, P367-P372.

World Health Organization. (2001). *ICF*, *International Classification of Functioning, Disability and Health*. Geneva: World Health Organization.

Yang, Y. (2006). How does functional disability affect depressive symptoms in late life? The role of perceived social support and psychological resources. *Journal of Health and Social Behavior, 47*, 355-372.

Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., & Leirer, V. O. (1983). Development and validation of a geriatric depression screening scale: a preliminary report. *Journal of Psychiatric Research*, *17*, 37-49.

Zautra, A. J., Affleck, G. G., Tennen, H., Reich, J. W., & Davis, M. C. (2005). Dynamic approaches to emotions and stress in everyday life: Bolger and Zuckerman reloaded with positive as well as negative affects. *Journal of Personality*, *73*, 1511-1538.

Zautra, A. J., Potter, P. T., & Reich, J. W. (1997). The independence of affects is context-dependent: An integrative model of the relationship between positive and negative affect. *Annual Review of Gerontology and Geriatrics*, *17*, 75-103.

Zautra, A. J., Reich, J. W., & Guarnaccia, C. A. (1990). Some everyday life consequences of disability and bereavement for older adults. *Journal of Personality and Social Psychology*, *59*, 550-561.

Zeiss, A. M., Lewinsohn, P. M., & Munoz, R. F. (1979). Nonspecific improvement effects in depression using interpersonal cognitive, and pleasant events focused treatments. *Journal of Consulting and Clinical Psychology, 47*, 427–439.

Zeiss, A. M., Lewinsohn, P. M., Rohde, P., & Seeley, J. R. (1996). Relationship of physical disease and functional impairment to depression in older people. *Psychology and Aging*, *11*, 572.

Zheng, D., Macera, C. A., Croft, J. B., Giles, W. H., Davis, D., & Scott, W. K. (1997). Major depression and all-cause mortality among white adults in the United States. *Annals of Epidemiology*, *7*, 213-218.

Zimmer, Z., Hickey, T., & Searle, M. S. (1995). Activity participation and well-being among older people with arthritis. *The Gerontologist*, *35*(4), 463-471.

Zimmer, Z., Hickey, T., & Searle, M. S. (1997). The pattern of change in leisure activity behavior among older adults with arthritis. *The Gerontologist*, *37*, 384-393.

Table 1. Sample Characteristics (N = 82)

Characteristic	n (%)	M (SD)
Age		77.6 (8.0)
Gender: female	53 (64.6)	
Ethnicity		
White	80 (97.6)	
Black	1 (1.2)	
Native American	1 (1.2)	
Marital status		
Single	12 (14.6)	
Married	31 (37.8)	
Live-in-partner	2 (2.4)	
Divorced	4 (4.9)	
Widowed	33 (40.2)	
Highest level of education		
Some high school	8 (9.8)	
High school/GED	24 (29.3)	
Some college	12 (14.6)	
College degree	33 (40.6)	
Other (not specified)	5 (6.1)	
Current occupational status		
Full-time	6 (7.3)	
Part-time	5 (6.1)	
Homemaker	3 (3.7)	
Retired	67 (81.7)	
Disabled	1 (1.2)	
Subscribe religion	77 (94.0)	
Religion attendance		
Once a week	43 (52.4)	
Every two weeks	7 (8.5)	
Once a month	4 (4.9)	
Once every six months	2 (2.4)	
Never	22 (26.8)	
Other	4 (4.9)	
Health literacy		
Extremely	43 (52.4)	
Quite a bit	28 (34.1)	
Somewhat	5 (6.1)	
A little bit	2 (2.4)	
Not at all	4 (4.9)	
Physical illness		
Arthritis	56 (68.3)	
Depression	14 (17.1)	
High blood pressure	50 (61.0)	
Diabetes	19 (23.2)	

Anxiety	21 (25.6)
Cancer	9 (11.0)
Obesity	18 (22.0)
Breathing problems	24 (29.3)
Back problems	37 (45.1)
Stroke	9 (11.0)
Heart attack	12 (14.6)
Broken bones or factures	42 (51.2)
Health	
Excellent	20 (24.4)
Good	41 (50.0)
Fair	13 (15.9)
Poor	8 (9.8)

Table 2. Means, Standard Deviations, and Pearson's Correlation Coefficients for Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Age	77.6	8.0	---	.							
2. Disability	4.6	7.8	.30**	---							
3. Freq. of pleasant events	1.2	.3	-.15	-.41**	---						
4. Pleasantness ratings	1.6	.2	-.02	-.07	.58**	---					
5. Obtained pleasure	2.0	.6	-.12	-.30**	.93**	.82**	---				
6. GDS	1.8	2.6	.16	.55**	-.49**	-.11	-.40**	---			
7. GSIS-MIL	34.7	4.3	-.07	-.38**	.64**	.44**	.61**	-.51**	---		
8. PANAS-PA	37.5	6.9	.04	-.34**	.61**	.43**	.61**	-.39**	.61**	---	
9. MoCA	23.8	5.0	-.41**	-.40**	.26*	-.04	.14	-.39**	.20	.16	---
10. DSSI	16.0	3.0	.06	-.28*	.16	.04	.13	-.28*	.18	.04	.17

Note. N = 81-82, with variation due to missing data.

* *p* < .05.

** *p* < .01.

GDS = Geriatric Depression Scale; GSIS-MIL = Geriatric Suicide Ideation Scale-Meaning in Life Subscale; PANAS-PA = Positive and Negative Affect Schedule-Positive Affect Subscale; MOCA = The Montreal Cognitive Assessment; DSSI = Duke Social Support Index.

Figure 1. Mediational models for hypotheses 1a-c

H1a.

$a_1 = .17, p < .01.$ $b_1 = .93, p < .01.$

Freq. of pleasant events

Physical Disability $c_1' = .59, p < .01.$ Depressive symptoms

$a_1b_1 = .16, p < .05.$

H1b.

$a = .18, p < .01.$ $b_1 = 8.71, p < .00.$

Freq. of pleasant events

Physical Disability $c_1' = -1.19, p > .05.$ Meaning in life

$a_1b_1 = -1.58, p < .05.$

H1c.

$a = .18, p < .05.$ $b_1 = 14.6, p < .001.$

Freq. of pleasant events

Physical Disability $c_1' = -1.75, p > .05.$ Positive affect

$a_1b_1 = -1.58, p < .05.$
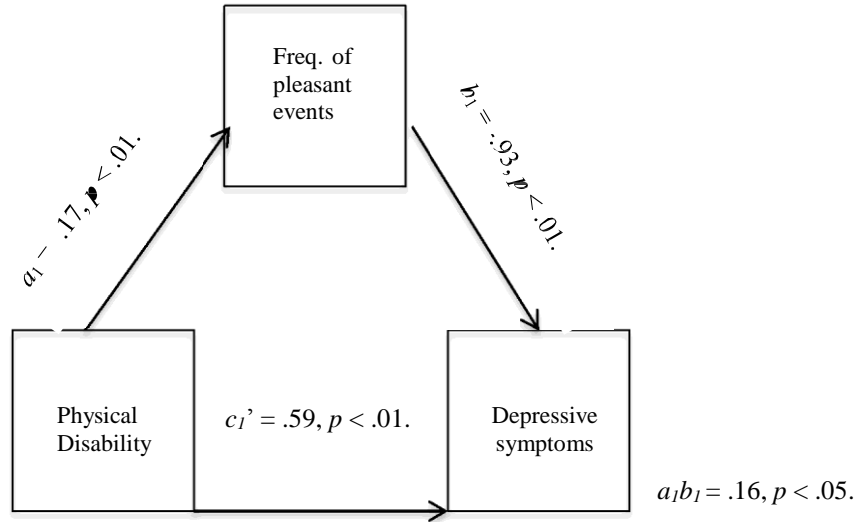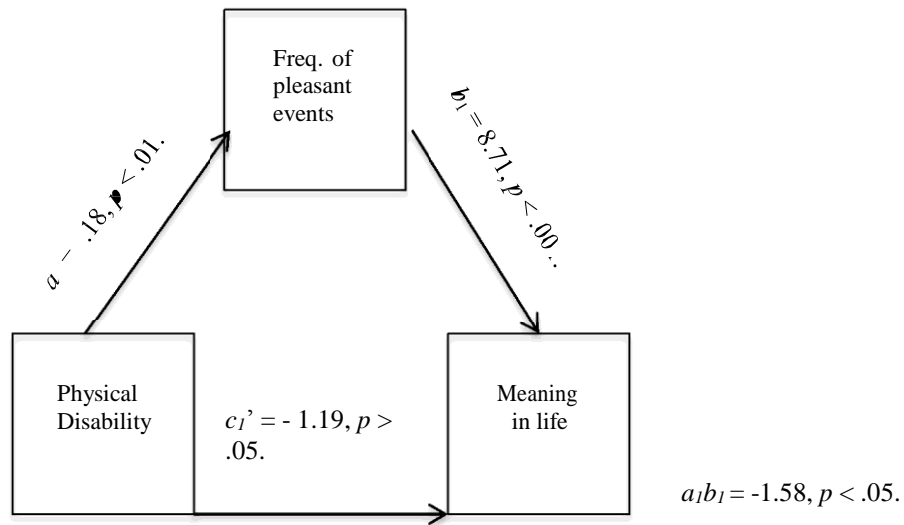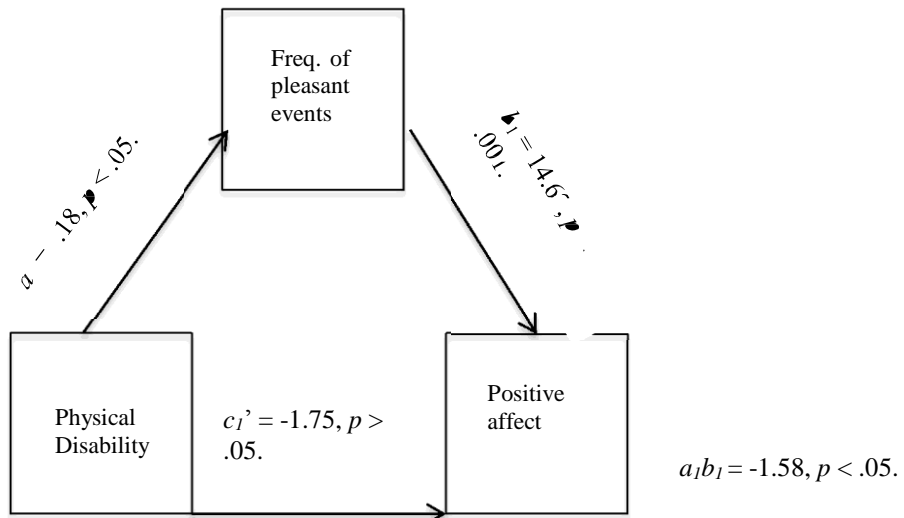
Figure 2. Mediational models for hypotheses 2a-c

H2a.
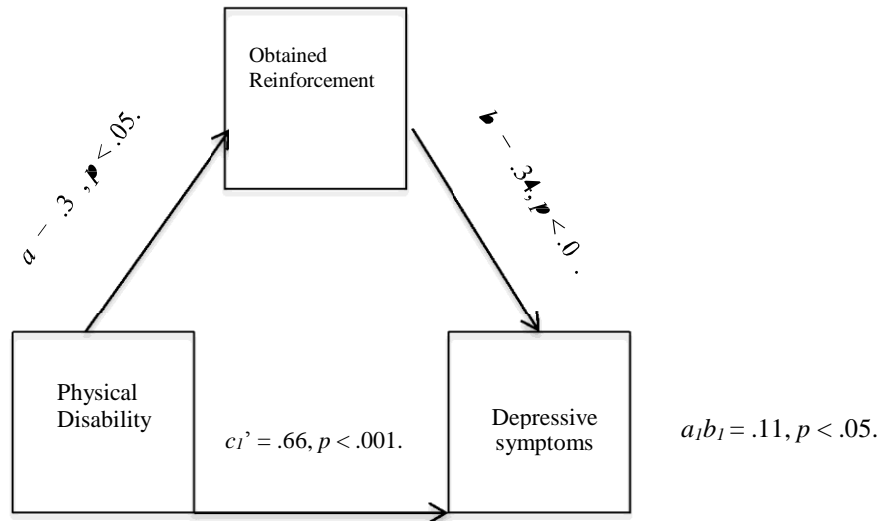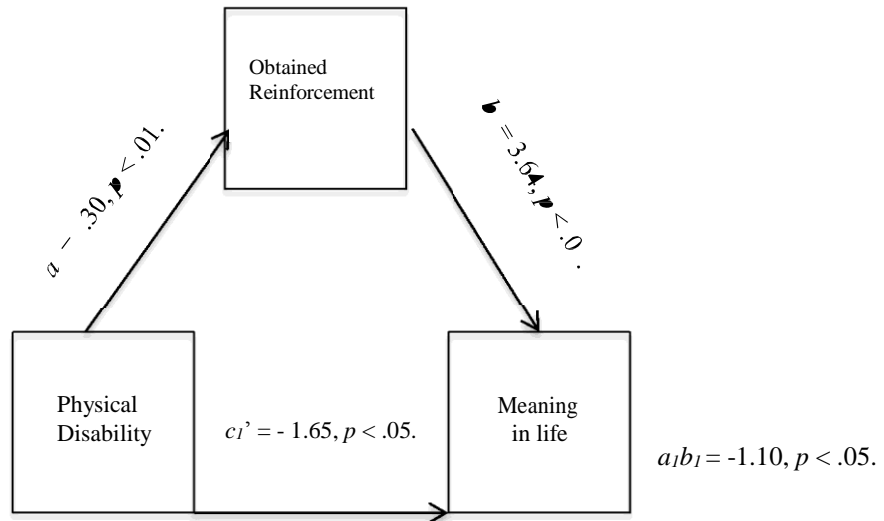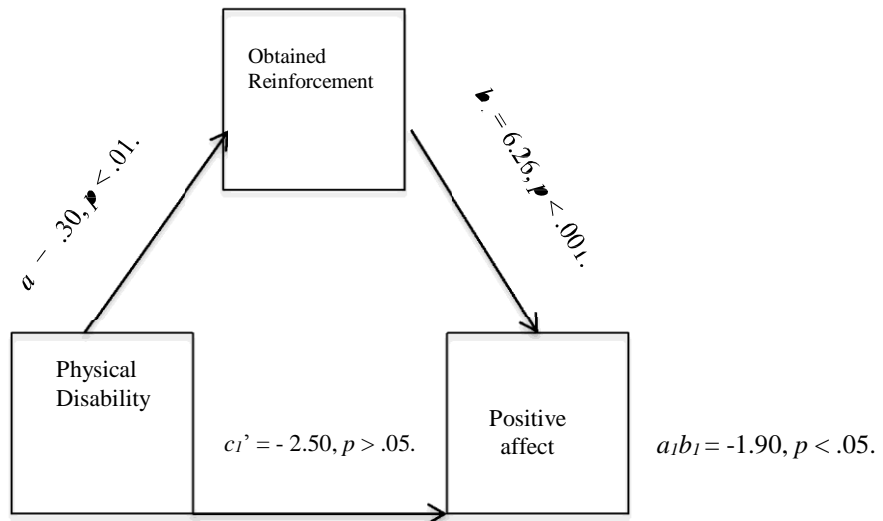
Obtained
Reinforcement

$a = .3$, $p < .05$.

$b = -.34$, $p < .0$.

Physical
Disability

$c_1' = .66$, $p < .001$.

Depressive
symptoms

$a_1b_1 = .11$, $p < .05$.

H2b.

Obtained
Reinforcement

$a = .30$, $p < .01$.

$b = 3.64$, $p < .0$.

Physical
Disability

$c_1' = -1.65$, $p < .05$.

Meaning
in life

$a_1b_1 = -1.10$, $p < .05$.

H2c.

Obtained
Reinforcement

$a = .30$, $p < .01$.

$b. = 6.26$, $p < .001$.

Physical
Disability

$c_1' = -2.50$, $p > .05$.

Positive
affect

$a_1b_1 = -1.90$, $p < .05$.

Appendix A. Activities of Daily Living and Instrumental Activities of Daily Living (ADLs and IADLs). The following questions ask you about the activities that you have to do in your daily life. For each activity, please check the appropriate box for whether you cannot perform the activity, you can perform the activity with some help, or you can perform the activity without any help.

	I **cannot perform** this activity.	I can perform this activity **with some help**.	I **can perform** this activity without any help.
Can you use the telephone?			
Can you get to places that are not within walking distance (i.e. driving, public transportation)?			
Can you manage your money?			
Can you take your medicine correctly?			
Can you do your grocery shopping?			
Can you prepare your meals?			
Can you take care of your housework?			
Can you do the basic maintenance in your home?			
Can you feed yourself?			
Can you dress and undress?			
Can you take care of your appearance (for example, comb your hair)?			
Can you do laundry?			
Can you walk?			
Can you walk up and down stairs?			
Can you get in and out of bed?			
Can you get in and out of the bathtub?			
Can you shower or bathe?			
Can you stand up if you have been seated on an ordinary chair without arms?			
Can you reach above shoulder height?			
Can you bend down to pick up something from the floor?			
Can you manage small things with your fingers (for example, writing)?			

Appendix B. Geriatric Depression Scale- Short Form.

Choose the best answer for how you have felt over the past week:

1. Are you basically satisfied with your life?   YES / NO

2. Have you dropped many of your activities and interests?   YES / NO

3. Do you feel that your life is empty?   YES / NO

4. Do you often get bored?   YES / NO

5. Are you in good spirits most of the time?   YES / NO

6. Are you afraid that something bad is going to happen to you?   YES / NO

7. Do you feel happy most of the time?   YES / NO

8. Do you often feel helpless?   YES / NO

9. Do you prefer to stay at home, rather than going out and doing new things?   YES / NO

10. Do you feel you have more problems with memory than most?   YES / NO

11. Do you think it is wonderful to be alive now?   YES / NO

12. Do you feel pretty worthless the way you are now?   YES / NO

13. Do you feel full of energy?   YES / NO

14. Do you feel that your situation is hopeless?   YES / NO

15. Do you think that most people are better off than you are?   YES / NO

Appendix C. Geriatric Suicide Ideation Scale-Meaning in Life Subscale.
Listed below are a number of statements concerning your feelings and beliefs about your life. Please read each statement carefully, and decide whether you agree or disagree with it, and to what extent, as indicated below. Please be completely honest in your responses, and try to respond to every statement. Do not check more than one response for each statement.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Life is extremely valuable to me.					
I feel that I am needed in this world.					
I feel that my life is meaningful.					
I have come to accept my life with all of its ups and downs.					
I find joy and beauty in life.					
I am certain that I have something to live for.					
I feel that my life still has dignity.					
I believe that others need me.					

Appendix D. Positive and Negative Affect Schedule.
Read each item and then select the number from the scale that best matches the extent you feel this way right now, that is, in the present moment.

1.   *Interested*

1	2	3	4	5

Very slightly   A little   Moderately   Quite a bit   Extremely
or not at all

2.   *Excited*

1	2	3	4	5

Very slightly   A little   Moderately   Quite a bit   Extremely
or not at all

3.   *Strong*

1	2	3	4	5

Very slightly   A little   Moderately   Quite a bit   Extremely
or not at all

4.   *Enthusiastic*

1	2	3	4	5

Very slightly   A little   Moderately   Quite a bit   Extremely
or not at all

5.   *Proud*

1	2	3	4	5

Very slightly   A little   Moderately   Quite a bit   Extremely
or not at all

6.   *Alert*

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

7.   *Inspired*

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

8.   *Determined*

1	2	3	4	5
Very slightly	A little	Moderately	Quite a bit	Extremely

or not at all

9.   *Attentive*

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

10.   *Active*

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

Appendix E. Older Person's Pleasant Event Schedule.

For each event, we would like you to make 2 ratings.

A. *How often* did this event happen to you in the past month (Circle the appropriate number in column A).

0 = Not at all
1 = 1-6 Times
2 = 7 or More Times

B. *How pleasant*, enjoyable, or rewarding was this event? If the event did not occur, then please rate how pleasant you think it *would have been* if it had occurred.

0 = Not pleasant or would not have been pleasant
1 = Somewhat pleasant or would have been somewhat pleasant
2 = Very pleasant or would have been very pleasant

Please keep in mind that you should circle an answer for both *HOW OFTEN* and *HOW PLEASANT* for each event.

Activity	**Column A** *How often in the past month?* 0 = Not at all 1 = 1-6 times 2 = 7 or more times N/A = Not applicable Circle one number			Column B *How pleasant was it or would it have been?* 0 = Not pleasant 1 = Somewhat pleasant 2 = Very Pleasant N/A = Not applicable Circle one number		
1. Looking at clouds	0	1	2	0	1	2
2. Having people show an interest in what I say	0	1	2	0	1	2
3. Being with friends	0	1	2	0	1	2
4. Seeing beautiful scenery	0	1	2	0	1	2
5. Having a frank and open conversation	0	1	2	0	1	2
6. Having coffee, tea, or cocoa with others	0	1	2	0	1	2
7. Thinking about pleasant memories	0	1	2	0	1	2
8. Kissing, touching, showing affection	0	1	2	0	1	2
9. Doing a job well done	0	1	2	0	1	2
10. Seeing good things happen to family or friends	0	1	2	0	1	2
11. Saying something clearly	0	1	2	0	1	2
12. Complimenting or praising	0	1	2	0	1	2

someone						
13. Amusing people	0	1	2	0	1	2
14. Being with someone I love	0	1	2	0	1	2
15. Making a new friend	0	1	2	0	1	2
16. Being complimented or told I've done something well	0	1	2	0	1	2
17. Expressing my love to someone	0	1	2	0	1	2
18. Helping someone	0	1	2	0	1	2
19. Listening to sounds of nature	0	1	2	0	1	2
20. Meeting someone new of the same sex	0	1	2	0	1	2
21. Planning trips or vacations	0	1	2	0	1	2
22. Being praised by people I admire	0	1	2	0	1	2
23. Doing a project my own way	0	1	2	0	1	2
24. Being told I am needed	0	1	2	0	1	2
25. Being loved	0	1	2	0	1	2
26. Listening to music	0	1	2	0	1	2
27. Completing a difficult task	0	1	2	0	1	2
28. Having an original idea	0	1	2	0	1	2
29. Seeing or smelling a flower or plant	0	1	2	0	1	2
30. Being asked for help or advice	0	1	2	0	1	2
31. Thinking about myself	0	1	2	0	1	2
32. Being with happy people	0	1	2	0	1	2
33. Looking at the stars or moon	0	1	2	0	1	2
34. Giving advice to others based on past experience	0	1	2	0	1	2
35. Watching a sunset	0	1	2	0	1	2
36. Reading or listening to books on tape	0	1	2	0	1	2
37. Listening to the birds sing	0	1	2	0	1	2
38. Reading magazines	0	1	2	0	1	2
39. Being needed	0	1	2	0	1	2
40. Having a clean house	0	1	2	0	1	2
41. Having a daily plan	0	1	2	0	1	2
42. Shopping	0	1	2	0	1	2
43. Smiling at people	0	1	2	0	1	2
44. Planning or organizing something	0	1	2	0	1	2
45. Meditating	0	1	2	0	1	2
46. Solving a puzzle, crossword, or problem	0	1	2	0	1	2
47. Getting out of the city (to the mountains, seashore, desert)	0	1	2	0	1	2
48. Exploring new areas	0	1	2	0	1	2
49. Visiting a museum	0	1	2	0	1	2
50. Doing volunteer work	0	1	2	0	1	2
51. Collecting recipes	0	1	2	0	1	2
52. Working on a community project	0	1	2	0	1	2

53. Baking because I feel creative	0	1	2	0	1	2
54. Listening to music	0	1	2	0	1	2
55. Bargain hunting	0	1	2	0	1	2
56. Arranging flowers	0	1	2	0	1	2
57. Creative crafts	0	1	2	0	1	2
58. Shopping for a new outfit	0	1	2	0	1	2
59. Thinking about something good in the future	0	1	2	0	1	2
60. Thinking about people I like	0	1	2	0	1	2
61. Having peace and quiet	0	1	2	0	1	2
62. Feeling a divine presence	0	1	2	0	1	2
63. Having spare time	0	1	2	0	1	2
64. Being near sand, grass, a stream	0	1	2	0	1	2
65. Going to church	0	1	2	0	1	2
66. Taking inventory of my life	0	1	2	0	1	2
67. Sitting, walking, or rolling wheelchair	0	1	2	0	1	2
68. Having someone read to you something, such as a book, newspaper, or cards	0	1	2	0	1	2
69. Watching T.V.	0	1	2	0	1	2
70. Talking on the telephone	0	1	2	0	1	2
71. Doing handwork (crocheting, woodworking, crafts, drawing, ceramics, clay work, etc.)	0	1	2	0	1	2
72. Laughing	0	1	2	0	1	2
73. Having a visit from family or friends	0	1	2	0	1	2
74. Sharing a meal with friend or family	0	1	2	0	1	2
75. Making or eating a snack	0	1	2	0	1	2
76. Wearing favorite clothes	0	1	2	0	1	2
77. Getting or sending cards, letters	0	1	2	0	1	2
78. Going on an outing	0	1	2	0	1	2
79. Exercise (walking, stretching, physical therapy)	0	1	2	0	1	2
80. Going for a ride or drive in the car	0	1	2	0	1	2
81. Grooming (wearing make-up, shaving, having nails done)	0	1	2	0	1	2
82. Having a shower or bath	0	1	2	0	1	2
83. Recalling or discussing past events	0	1	2	0	1	2
84. Participating in group activities (BINGO, trivia, current events)	0	1	2	0	1	2

Appendix F. Duke Social Support Index-Abbreviated-Satisfaction with Support Subscale.

1. Does it seem that your family and friends (i.e. people who are important to you) understand you?

Hardly ever   Some of the time   Most of the time

2. Do you feel useful to your family and friends (i.e. people important to you)?

Hardly ever   Some of the time   Most of the time

3. Do you know what is going on with your family and friends?

Hardly ever   Some of the time   Most of the time

3. When you are talking with your family and friends, do you feel you are being listened to?

Hardly ever   Some of the time   Most of the time

4. Do you feel you have a definite role (place) in your family and among your friends?

Hardly ever   Some of the time   Most of the time

5. Can you talk about your deepest problems with at least some of your family and

friends?

Hardly ever   Some of the time   Most of the time

Appendix G. Montreal Cognitive Assessment

MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME :
Education :
Sex :
Date of birth :
DATE :

VISUOSPATIAL / EXECUTIVE

E End

A

5

B 2

1 Begin

D 4

3

C

[ ]

Copy cube

[ ]

Draw CLOCK (Ten past eleven) (3 points)

[ ] Contour [ ] Numbers [ ] Hands

POINTS

__/5

NAMING

[ ]   [ ]   [ ]   __/3

MEMORY	Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.		FACE	VELVET	CHURCH	DAISY	RED	No points
	1st trial						
	2nd trial						

ATTENTION | Read list of digits (1 digit/ sec.). | Subject has to repeat them in the forward order [ ] 2 1 8 5 4 | __/2
--- | --- | ---
| | Subject has to repeat them in the backward order [ ] 7 4 2 |

Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors
[ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B   __/1

Serial 7 subtraction starting at 100   [ ] 93   [ ] 86   [ ] 79   [ ] 72   [ ] 65   __/3
4 or 5 correct subtractions: **3 pts**, 2 or 3 correct: **2 pts**, 1 correct: **1 pt**, 0 correct: **0 pt**

Appendix H. Chronic Illness Checklist

Please indicate which conditions you have by circling YES or NO.

Condition	Do you have this health condition?	
Arthritis	Yes	No
Depression	Yes	No
High Blood Pressure	Yes	No
Diabetes	Yes	No
Anxiety	Yes	No
Cancer	Yes	No
Obesity	Yes	No
Breathing Problems	Yes	No
Back Problems	Yes	No
Stroke	Yes	No
Heart Attack	Yes	No
Broken bones or fractures	Yes	No

Appendix I. Demographics. These questions ask for information that will be used to interpret our results. Results will be reported only by group, and not for individual respondents. Your answers are anonymous and cannot be linked to you individually.

1. What is your age? _____

2. What is your gender
   a. Male
   b. Female

3. What is your race or ethnic background? (please choose one)
   a. White/Caucasian, not Hispanic
   b. Black/African-American
   c. Hispanic
   d. Native American
   e. Asian/Pacific Islander
   f. Mixed race
   g. Other _____

4. What is your marital status?
   a. Single
   b. Married
   c. Live-in partner
   d. Separated
   e. Divorced
   f. Widowed

5. In what city and state do you currently live? _____
   _____

6. What city and state would you consider your hometown? _____
   _____

7. How would you describe the place, or the type of place, that you most closely identify with (e.g., your hometown)? (please choose one)
   a. Rural (2,500 or fewer residents)
   b. Small town (more than 2,500 but fewer than 20,000)
   c. Town/small city (20,000-100,000 resident)
   d. Large city (more than 100,000 residents)

8. Highest level of education?

a. Less than High School
   b. GED
   c. High School
   d. Some College
   e. College Degree
   f. Other_____

9. What is your current job or occupation status?
   a. Working full time
   b. Working part time
   c. Homemaker
   d. Student
   e. Looking for work, unemployed
   f. Retired
   g. Disabled – unable to work

10. What is the totally yearly income (in US dollars) for everyone in your household put together? (If you are a dependent of your parent(s), select their household income.)
   a. Less than 10,000
   b. 10,000-14,999
   c. 15,000 – 24,999
   d. 25,000 – 34,999
   e. 35,000 – 49,000
   f. 50,000 – 74,999
   g. 75,000 – 99,999
   h. 100,000 – 149,999
   i. 150,000 – 199,999
   j. 200,000 or more
   k. Don't know

11. What is your religious affiliation, if any? (e.g. Christian, Jewish, Muslim, etc.)

   _____

12. How often do you attend religious activities? (Please choose one).
   a. Once a week
   b. Every two weeks
   c. Once a month

    d. Once every six months
    e. Never
    f. Other

13. How confident are you filling out forms by yourself?
    a. Extremely
    b. Quite a bit
    c. Somewhat
    d. A little bit
    e. Not at all

14. How would you rate your health at the present time?
    a. Excellent
    b. Good
    c. Fair
    d. Poor

15. Do you use any aids, such as a walker, grab bars in the bathtub, or any other special equipment for personal care or everyday activities? Other examples include, wheelchair, special bed, aids to help with dressing, etc.?

    a. Yes
    b. No