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PRODUCTIVE ACTIVITIES AND SUBJECTIVE
WELL-BEING AMONG OLDER ADULTS:
THE INFLUENCE OF NUMBER OF ACTIVITIES
AND TIME COMMITMENT[★]

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ABSTRACT. This study examines relationships among three measures of subjective well-being (life satisfaction, happiness and depressive symptoms), and two global measures of productive activity (number of activities and time commitment). We argue that participation in multiple productive activities should increase subjective well-being because these behaviors increase social integration and provide meaningful social roles. Using the first two waves of the Americans' Changing Lives survey, we estimate a series of OLS and ordered logistic regression models to examine this issue among a sample of respondents 60 years old and older. Our multivariate regression results show that as time committed to productive activities increases, life satisfaction increases. Both increasing numbers of productive activities and increasing time commitment predict higher levels of happiness. Also, we find only modest support for a relationship between productive activities and the number of and changes in depressive symptoms. Our results provide support for the idea that engaging in productive activities is beneficial to older persons' well-being, implying confirmation of the role enhancement hypothesis and demonstrating the importance of social integration.

KEY WORDS: older persons, productive activities, subjective well-being

INTRODUCTION

The purpose of this study is to investigate relationships among productive activities and subjective well-being in later life. Specifically, we analyze the relationship between subjective well-being and the

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volume of productive activity in which persons engage, as characterized by the *number of activities and the time commitment to these activities*. We specifically concentrate on self-reports of life satisfaction, a global concept reflecting a cognitive evaluation of one's life situation, self-reported happiness, and depressive symptoms.

Gerontologists, feminist scholars, economists, and others have argued that productivity should be broadly defined to include unpaid, non-market activities (e.g., volunteering, caregiving; see, Bass and Caro, 2001; Herzog et al., 1989). Adopting this broad view, it is clear that older persons contribute significantly to the well-being of other individuals as well as to the larger society. Using data from the Commonwealth Productive Aging Study, Bass and Caro (1995) show that more than 25% of persons over age 55 work for pay, 25% provide assistance to one or more disabled persons, and 40% help care for children and grandchildren. Substantial evidence exists that the contributions of older persons, both in terms of paid and unpaid work, generate enormous benefits for the nation and for the individuals who are served. Estimates show that caregivers provided nearly \$200 billion in unpaid service in 1997 (Arno et al., 1999).

In part because of the recognition of these contributions by older persons, productive activity in later life has emerged in the last decade as an increasingly important area of gerontological scholarly endeavor (Morrow-Howell et al., 2001). Scholars now are not only asking questions about who engages in productive activities, but also whether and in what ways participation in a productive activity may be related to positive and negative outcomes in later life (Jackson et al., 1993). Our concern in this study is with the link between productive activities and subjective well-being.

Questions which remain to be addressed include whether the number of productive activities and the intensity of commitment to these activities enhance the quality of life of older persons (Jackson et al., 1993). Relatively few studies examine how participation in a wide range of productive activities, combined with the time committed to these activities, may impact an array of indicators of well-being. We believe it is instructive to acknowledge the fact that older persons are often involved, to varying degrees of commitment, with several different productive activities in their daily lives, and that the degree of involvement and commitment is likely to be important for conditioning subjective well-being. The examination of potential links

among productive activities and well-being is necessary because as people age they often lose important social roles, which may be related to the potential for declining well-being. Participation in multiple productive roles reflects the possibility that role substitution (e.g., moving from paid work to volunteering) may ameliorate the deleterious effects of role loss (see Mutchler et al., 2003).

We develop a rationale for why the number of productive activities and the intensity of commitment to these activities should be linked to subjective well-being drawing on the perspectives of role theory and social integration theory. As Wethington et al. (2000) note “The extensive knowledge base about social integration has clear implications for promoting *productive social involvement*, as well as health and well-being, through the later years of life” (emphasis added, p. 48). They go on to encourage researchers to look beyond the work role in terms of older persons’ well-being, including such roles as non-paid work, organizational and religious involvements, and family roles (e.g., caregiving). We take up their challenge, addressing our specific goals with data from the first two waves of the Americans’ Changing Lives (ACL) panel survey.

Productive Activity and Subjective Well-Being

This study focuses on two key concepts: productive activity and subjective well-being. Although observers have offered a number of conceptual definitions of productive activity, one key point emanating from the literature is that no consensus exists on how to define productive activity. However, a list of the components considered relevant includes market-based economic activities (paid work), non-market activities with economic value, such as formal social and civic contributions (volunteering, informal helping behavior or social assistance), self-improvement (education, training) and self-care (Sherraden et al., 2001). We take the position that activities defined as productive should benefit others (they should not be purely consumptive), should have a social component, and should be meaningful to individuals.

Based on these criteria, our definition of productive activity is activity that produces goods or services, whether paid or not; we specifically focus on activity that is embedded in social networks (Morrow-Howell et al., 2001). We focus on five broad categories of

productive activity: (1) paid work, (2) formal volunteering, (3) caregiving (for persons who have health problems), (4) informal helping behavior (e.g., providing transportation, running errands for others), and (5) do-it-yourself activities (e.g., yard work, home repair). Housework is not included in our measure because it is typically accomplished in isolation from other persons, whereas activities like yard work and home repair are more likely to place persons outside of their homes and in an environment where they may interact with friends and neighbors.

Compared to the study of productive aging, the study of subjective well-being in later life has a long history (e.g., Klumb, 2004; Lawton, 1975; Pinquart and Sorensen, 2000; Wheeler et al., 1998). Research shows that important correlates of subjective well-being include physical activity, socioeconomic status, social support, establishment of meaningful roles, and adequate physical health, as well as personality characteristics such as personal control, self-esteem and self-efficacy (e.g., Diener, 2000; Okun and Stock, 1984). Despite this history, the conceptual definition and empirical measurement of subjective well-being varies across disciplines and even within disciplines. Psychologists treat subjective well-being as a super-ordinate construct within the context of cognitive theories of emotion that subsume subordinate constructs such as happiness, life satisfaction, and morale (Stock et al., 1986). As used more broadly by gerontologists, subjective well-being is a somewhat amorphous concept, presenting researchers with a number of choices and perspectives, including physical, psychological, clinical, social, and cultural dimensions (Lawton, 1997).

A central concept in the study of subjective well-being is life satisfaction, which may be defined as “a cognitive assessment of one’s progress toward desired goals” (George, 1979, p. 210) or as “an assessment of overall conditions derived from a comparison of one’s aspirations and achievements” (Campbell et al., 1976: from Stock et al., 1986, p. 92). Sociologists, psychologists, health researchers, and others often include measures of depressive symptomology, self-esteem, self-efficacy and sometimes mastery (Krause et al., 1992) when conceptualizing subjective well-being. We employ an inclusive view of subjective well-being in this study, incorporating life satisfaction and happiness along with symptoms of psychological distress (depressive symptoms).

Literature Review: Research Linking Productive Activity and Well-Being

Studies examining links between productive activity and well-being usually focus on only one or perhaps a few of the broad array of productive activities in which older persons may be involved. While we believe this research represents an important contribution to the field, it does not address the question of how a wide range of productive activities in later life impacts well-being because it overlooks the fact that many older persons engage in numerous productive activities, sometimes dedicating a considerable amount of time to these activities. We briefly review the current empirical research focusing on specific productive activities and well-being.

Wilson (2000) concludes that volunteering activity improves both physical and mental health (see also Morrow-Howell et al., 2003; Wheeler et al., 1998; Young and Glasgow, 1998). Volunteering appears most beneficial for subjective well-being for those who are moderately to highly active volunteers, especially among those who report low levels of informal social interaction or who volunteer for religious organizations. Recent research on volunteering indicates that being involved in multiple types of volunteer activity is positively associated with life satisfaction, as well as level of self-reported health and mortality risk (Musick et al., 1999; Van Willigen, 2000). Musick et al. (1999) report that time commitment to volunteering is related to mortality in a curvilinear fashion, whereby those who do not volunteer at all and those who volunteer at higher levels do not receive the same survival benefits as those volunteering at a moderate level. It is not clear whether this same relationship holds for other measures of well-being.

Research findings on the links between labor force participation and subjective well-being are somewhat equivocal in that some analysts find that paid work in the later stages of the life course is not empirically linked to psychological or physical well-being while others find positive relationships. For example, one cross-sectional study found that paid work is immaterial to either positive or negative affect for both older men and older women (McIntosh and Danigelis, 1995) while results from another cross-sectional study from the same time period supported a positive relationship between work and life satisfaction (Aquino et al., 1996). Researchers

who have relied on cross-sectional data have come under criticism because links between productive activity participation and well-being are likely reciprocal and cannot be easily disentangled with such data. Although relatively little research using longitudinal data exists in examining paid work and life satisfaction, the longitudinal analyses that have been conducted tend to find no clear differences in well-being between retirement and non-retirement life stages (e.g., Palmore et al., 1985; Sterns et al., 1997).

The impact of caregiving for a disabled friend or relative on subjective well-being has been researched widely, often indicating a negative effect on the well-being of the caregiver – especially when the caregiver provides intensive amounts of care (Rose-Rego et al., 1998; Roth et al., 2001; Strawbridge et al., 1997). A major theme of this literature is that female caregivers seem to experience more depression, lower life satisfaction, and overall lower well-being when compared with male caregivers (Rose-Rego et al., 1998). Further, Pavalko and Woodbury (2000) indicate that extensive caregiving tends to have more negative effects on psychological well-being than physical well-being.

While the majority of extant research focuses on a single indicator of productive activity and well-being, there are examples of research that consider more complex pictures of the productive activities of older persons. Luoh and Herzog (2002), using three waves of the Asset and Health Dynamics among the Oldest Old (AHEAD) study, report finding that older persons who perform 100 or more hours of volunteering and paid work show improved health and survivorship. When Krause et al. (1992) compared the independent contributions of informal help and formal volunteering on well-being, they found that the total effect of informal help was an important contributor to well-being but that volunteering was not.

Antonucci et al. (1991) examined volunteer work, helping others, do-it-yourself activities, and housework to determine what effect these productive activities had on life satisfaction. Their cross-sectional analysis of ACL data indicated that men's life satisfaction was positively affected only by do-it-yourself activity and women's was positively affected by do-it-yourself activity and helping others. Women showed less life satisfaction when hours of volunteering increased. Glass et al. (1999) demonstrated that multiple productive

activities are important predictors of mortality among a group of healthy seniors employing prospective data from the New Haven Established Populations for Epidemiological Studies of the Elderly (EPESE). When comparing sets of productive activity measures to sets of social and physical activity measures, the productive activity set performed as well or better than the other two.

McIntosh and Danigelis (1995), using data from the first wave of the ACL study, compared and contrasted gender and race differences in subjective well-being for a number of indicators of productive activity. They found that paid work had no effect on their measures of subjective well-being for any of the race–gender groups they analyzed, but that religious participation and formal volunteering in non-religious organizations had positive effects for some gender–race groups and that informal helping benefited the well-being of women only. While each of these studies was path breaking in that they considered several indicators of productive activities and well-being, each had limitations including the use of cross-sectional data, lack of evaluation of time commitment to productive activities and/or truncated sets of control variables.

Role Theory, Social Integration, Productive Activity and Well-Being

What might explain the generally positive influence of engagement in productive activities for subjective well-being? We believe role theory (Adelmann, 1994; Crosby, 1986) and social integration theory (Durkheim, 1951; Rosow, 1967) are useful for conceptualizing how engagement in productive activity (and the social roles inherently tied to most of these activities) may influence subjective well-being (see also Klumb, 2004; Van Willigen, 2000). Both approaches stipulate that being embedded in supportive social networks, engaging in meaningful social roles, and receiving social support improves the quality of one's life (e.g., Pillemer et al., 2000). Observers have long argued that the more social positions or roles that a person occupies, the better their mental and physical health (see Moen et al., 1992; Verbrugge, 1983). The roles that a person occupies affect her/his self-perception and behavior in part by providing a wider and denser social network, increasing the possibility of receiving social support in times of need.

A substantial body of research supports the hypothesis that being embedded in social networks positively impacts well-being (e.g., Berkman and Syme, 1979; Glass et al., 1999; Silverstein and Parker, 2002; Thoits, 1983). We argue that productive activity is a behavioral expression of the commitment to specific social roles (more than simply a status) that places the individual within a variety of economic and non-economic networks (Jackson et al., 1993). Thus, participating as a volunteer, caregiver or neighborhood helper represents a productively active role (also consistent with activity theory). Further, productive activities are different from social activities, which typically do not have the goal of helping others. Productive activity is also different from physical activities (e.g., exercise) because physical activities are often accomplished in social isolation and do not have as an objective the provision of assistance to others.

Engagement in multiple productive activities leaves open the possibility that well-being may be impaired because a person finds him/herself stretched too thin with too many demands. This yields two competing possibilities in terms of the impact of the number of and time commitment to productive activities and subjective well-being. One possibility is that as engagement in productive activities increases, a role enhancement effect will occur, yielding higher levels of subjective well-being. The other possibility is that as the number of and commitment to productive activity roles increases beyond an unspecified point, role strain or role conflict will occur whereby subjective well-being will be negatively impacted. Further, as we noted above, research is emerging that suggests moderate involvement in specific productive activities in later life has more positive benefits than involvement at low or high levels. Our goal is to address the research question: How does the number of productive activities in which an older person engages and the time commitment to these activities impact subjective well-being?

Based on the weight of the empirical evidence and the perspectives of role theory and social integration theory, we hypothesize that:

1. As the number of productive activities increases, subjective well-being will increase.
2. As time commitment to productive activities increases, subjective well-being will increase.

3. A curvilinear relationship exists between productive activity and subjective well-being, such that the benefits of participation will accrue to persons who participate at moderate levels.

RESEARCH DESIGN

We use panel data from the ACL survey to investigate the relationship between productive activities and subjective well-being. The ACL survey is a nationally representative sample of 3617 persons age 25 and older living in the U.S. first interviewed in 1986 (Wave 1) with 2867 respondents re-interviewed in 1989 (Wave 2). The ACL over-samples Blacks and persons age 60 and over. We combine both waves of data for this analysis, selecting for analysis respondents who are age 60 or older at Wave 1 and who were interviewed in both waves ($N = 1279$). These data are particularly useful for this study for a number of reasons, including (1) the breadth and depth of information collected on productive activities and subjective well-being, (2) the collection of data at two time points, allowing us to accomplish a longitudinal analysis and helping us to disentangle the temporal relationship between productive activities and measures of subjective well-being, and (3) the data are nationally representative.

Sample weights are provided with the data file. Centered weights are estimated for the study sample and applied to adjust for the over-sampling characteristics of the original survey. Also, because the ACL data were collected using a complex sample design, it is necessary to move beyond a “naïve” weighting scheme to one that adjusts the data for the sampling error introduced at each level of sample selection. Although a naïve weighting strategy and a strategy that incorporates the clustering effects of the sample design yield similar regression coefficients, the standard errors of the coefficients are often different. The standard errors of the naïve weighting approach tend to be biased downward, sometimes yielding inappropriate estimates of statistical significance of effects. We employ the SVYREG and SVYOLOG procedures in STATA to estimate our regression models. We handle missing values due to item non-response by assigning the mean, median or modal response, as appropriate.

Because sample attrition occurs between the first and second waves of the panel, we compared survey respondents who were

interviewed at both time points (the study sample) with those respondents who were interviewed only at time one along a number of dimensions (see Appendix A). This analysis shows that respondents in our study sample were more likely to be female, younger, more highly educated, and report fewer health conditions than those who were not interviewed in both waves. In addition, study sample respondents participated in more productive activities, devoted more hours to productive activity, were more physically and socially active, and reported a larger social support network than respondents who were not re-interviewed. Finally, those who remained in the panel reported being more satisfied with life and having fewer depressive symptoms than those who left the study. Based on these differences, readers should use appropriate caution with respect to the generalizability of the results.

Dependent variables. We examine three measures of subjective well-being from the second wave of the ACL. The first two include global measures of life satisfaction and happiness. Life satisfaction is measured on a seven-point scale (1 = completely dissatisfied to 7 = completely satisfied). Happiness includes three response categories (not too happy, pretty happy and very happy). The response sets for both indicators are ordered. In preliminary analyses, we estimated ordered logistic regression models in an attempt to more effectively capture the rank-order information in these variables. However, for life satisfaction, the proportional odds test indicated that it was inappropriate to employ ordered logistic regression with this variable (see Long, 1997). Therefore, we treat the life satisfaction measure as if it were a continuous variable, estimating life satisfaction models using OLS regression techniques. The proportional odds test for the happiness variable indicated that using ordered logistic regression techniques was appropriate. We also include a count of the number of depressive symptoms, using a modified measure of the CESD scale (CESD; Radloff, 1977; Wallace and O'Hara, 1992). This measure is created by summing the eleven indicators of depressive symptoms found in the ACL (range 0–11; $\alpha = 0.78$): OLS regression techniques are employed for this dependent variable.

Independent variables. Two indexes of productive activity are generated; one represents the total number of productive activities in which respondents are involved and the other estimates the amount of time commitment respondents give to all productive activities

combined. The first composite index measuring number of productive activities includes regular and irregular paid work, five types of formal volunteering, acute and chronic caregiving for a disabled friend, relative, or neighbor, four types of informal help provided to friends, relatives or neighbors and four types of do-it-yourself (domestic) activities (range 0–16: $\alpha = 0.72$). Approximately 97% of respondents in our study sample reported participating in housework (defined as work inside the home as compared to domestic activities engaged in outside the home). Thus adding housework to our measure of productive activity would not greatly affect the variability of our productive activity index.

The second composite index measures respondents' time commitment to productive activities. The ACL does not provide time commitment for each of the specific activities listed above, but rather it groups the more specific activities into five broad categories: paid work, volunteering, caregiving, informal help, and do-it-yourself activity. Hours of paid work are reported in continuous hours annually, whereas for the other productive activity variables, time commitment is reported in six broad categories. We group the hours reported for each activity into four categories: no time committed = 0, low commitment = 1, medium commitment = 2, and high commitment = 3 (see Appendix B for details on this grouping strategy). This strategy allows us to have a common metric of time commitment across the productive activities. We create a composite index (range 0–20) by summing respondents' level of commitment on each of the five dimensions of productive activity ($\alpha = 0.48$).

We also include measures of other types of activity likely to influence an older person's subjective well-being. First, a composite measure is created to capture level of involvement in physical activities: gardening, taking walks, and exercising/playing sports (0 = never, 1 = rarely, 2 = sometimes, 3 = often). Level of involvement across types of physical activity is summed to form a measure ranging from 0 to 9. Social activity is measured in a similar way by summing across three activities: attending meetings, talking on the phone, and visiting friends (0 = never, 1 = less than once a month, 2 = about once a month, 3 = two or three times a month, 4 = once a week, 5 = more than once a week: range = 0–15).

Additional control variables include respondent's age (years), sex (1 = female), race (1 = Black), marital status (1 = married), number of

persons who could provide social support in times of need (0–40), education (years), self-reported number of health conditions (0–7), and religious participation (religious service attendance, read religious books, watch or listen to religious programming; range = 1–18). More detail on the definitions and coding of the variables is presented in Appendix B.

We make use of both waves of the ACL panel data, estimating models where the predictor variables are measured at Wave 1 and subjective well-being is measured at Wave 2. This strategy increases the likelihood that any relationships we find among subjective well-being and productive activity in later life are not confounded by simultaneous measurement of the variables in the model (this strategy does not prove causality).

For life satisfaction and depressive symptoms, we take a longitudinal multivariate regression approach that allows us to predict *levels* of subjective well-being at Wave 2, as well as *changes* in subjective well-being between Wave 1 and Wave 2 as a function of the number of productive activities and the time commitment to these activities. For the analysis of levels of subjective well-being, we include the set of control variables identified above. For the change analysis, we include a baseline (Wave 1) measure of either life satisfaction or depressive symptoms along with the set of control variables. Because the ACL survey does not ask a question about happiness at Wave 1, we are only able to estimate models of *level* of happiness at Wave 2.

Finally, because some research shows that caregiving is negatively related to subjective well-being whereas our other indicators are positively related to subjective well-being, we estimated our multivariate regression models with modified productive activity variables. The modification involved dropping caregiving from the indexes. The results of these regressions are consistent with the results based on the full index (results available from authors upon request). Therefore, we report the results from the full productive activity indexes.

RESULTS

Descriptive statistics and zero-order correlations are shown in Table I. The mean global life satisfaction score for this sample of respondents age 60 and above is 5.6 (s.d.=1.5) and the mean

TABLE I
Zero-order correlations and descriptive statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 PA#	1.0														
2 PA h	0.835*	1.0													
3 Age	-0.314*	-0.305*	1.0												
4 Female	-0.216*	-0.162*	0.070*	1.0											
5 Black	-0.132*	-0.120*	0.014	0.023	1.0										
6 Married	0.302*	0.233*	-0.238*	-0.271*	-0.113*	1.0									
7 Education	0.367*	0.368*	-0.183*	-0.005	-0.227*	0.122*	1.0								
8 Health	-0.171*	-0.182*	0.114*	0.151*	0.113*	-0.104*	-0.200*	1.0							
9 PhyAct	0.482*	0.419*	-0.195*	-0.195*	-0.130	0.159*	0.255*	-0.207*	1.0						
10 SocAct	0.331*	0.319*	0.015	0.184*	-0.047	0.011	0.245*	-0.081*	0.198*	1.0					
11 Religious Part	0.073*	0.055*	0.107*	0.150*	0.182*	-0.027	-0.127*	0.130*	0.053	0.250*	1.0				
12 Support	0.195*	0.179*	-0.054	-0.062*	-0.075*	0.104*	0.018	-0.023	0.111*	0.095*	0.141*	1.0			
13 Life Satisfaction2	0.088*	0.117*	0.002	-0.005	0.003	0.072*	-0.045	-0.098*	0.113*	0.105*	0.110*	0.146*	1.0		
14 CESD2	-0.238*	-0.230*	0.094*	0.140*	0.091*	-0.113*	-0.229*	0.250*	-0.247*	-0.103*	0.047	-0.111*	-0.364*	1.0	
15 Happiness2	0.188*	0.187*	0.008	-0.081	-0.045	0.142*	0.076	-0.138*	0.187*	0.152*	0.082*	0.176*	0.525*	-0.307*	1.0
Mean	4.7	5.0	69.6	0.60	0.09	0.62	10.9	1.9	5.0	8.9	7.8	8.7	5.6	3.4	1.2
StdDev	2.9	2.9	6.9	0.49	0.28	0.49	3.4	1.4	2.6	3.3	4.3	8.5	1.5	2.7	0.63

Source: 1986 and 1989 Americans' Changing Lives Survey. See text and Appendix B for variable definitions.

Notes: N (unweighted) = 1279. Statistics based on weighted data. Variables 1–11 from Wave 1 and variables 13–15 from Wave 2. * $p \leq 0.05$.

1 PA = Productive activities index 1 (number of activities); 2 PA h = Productive activities index 2 (annual hours); 3 Age = Respondent's Age in years; 4 Female (versus male); 5 Black (versus non-black); 6 Married (versus non-married); 7 Education (years); 8 Health (number of health conditions); 9 PhyAct (physical activities index); 10 SocAct (social activities index); 11 ReligiousPart (religious participation index); 12 Support (social support index); 13 Life Satisfaction2 (global question); 14 CESD2 (depressive symptoms index); 15 Happiness2 (global question).

happiness score is 1.2 (s.d. = 0.6). The mean depressive symptom index score is 3.4 (s.d. = 2.7). The mean number of productive activities reported is 4.7 (s.d. = 2.9). The mean age of the sample is 69.6 (s.d. = 6.9); 60% of the sample is female and 9% of the sample is African American. Sixty-two percent of respondents are married and the mean number of years of education is 10.9 (s.d. = 3.4). The mean number of health conditions is 1.9 (s.d. = 1.4) and the score for the physical and social activities measures are 5 and 8.9, respectively. The mean number of persons in respondents' social support network is 8.7 (s.d. = 8.5) and the mean religious participation score is 7.8 (s.d. = 4.3).

Bivariate relationships among the variables are given in the form of correlations. The number of productive activities reported and the commitment of time to these activities are positively correlated with both life satisfaction and happiness and negatively correlated with number of depressive symptoms. Respondents reporting more physical and social activities, as well as those who are more engaged in religious activities and who report larger social support networks, report higher levels of life satisfaction and happiness and fewer depressive symptoms. Further, being married is positively associated with both of these measures of subjective well-being while poor health is negatively correlated. These findings are consistent with findings reported in the existing research literature.

Table II describes the mean number of productive activities measured at Wave 1 for specific categories of the dependent variables measured at Wave 2 – life satisfaction, happiness, and depressive symptoms. Panel A (Life Satisfaction) demonstrates that the mean number of productive activities for older persons reporting being dissatisfied on the life satisfaction measure is 3.1 ($N = 42$) while the mean number of activities for those who report being satisfied is 4.9 ($N = 773$). Panel B (Happiness) shows that those older persons who report they are “not too happy” participate in an average of 3.1 productive activities ($N = 147$). Those who report being “very happy” participate in an average of 5.2 productive activities ($N = 444$). Panel C (Depressive Symptoms) shows that the majority of individuals ($N = 807$) report no depressive symptoms; these respondents also report participating in an average of 5.2 productive activities. Persons reporting five or more depressive symptoms ($N = 38$) report participating in an average of 2.7 activities, slightly more than half as many as those reporting no symptoms.

TABLE II

Mean productive activity levels for categories of life satisfaction, happiness, and depressive symptoms

Panel A						
Life satisfaction Wave 2 (range 1–7)						
Productive activities	Dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Satisfied	
Mean # (0–15)	3.1	3.7	4.3	5.0	4.9	
<i>N</i>	42	54	243	168	773	
Panel B						
Happiness Wave 2 (range 0–2)						
Productive activities	Not too happy		Pretty happy		Very happy	
Mean # (0–15)	3.1		4.7		5.2	
<i>N</i>	147		688		444	
Panel C						
Depressive symptoms Wave 2 (range 0–11)						
Productive activities	0	1	2	3	4	5+
Mean # (0–15)	5.2	4.0	3.6	4.0	3.9	2.7
<i>N</i>	807	255	119	37	23	38

Thus a general pattern exists showing that as the mean number of productive activities increases, so too does subjective well-being. Also, for life satisfaction and depressive symptoms, the advantage of participating in productive activities is highest among those reporting a moderate number of productive activities, suggesting the possibility of a curvilinear effect. At this more simple level of analysis, the data indicate that low and high levels of participation in productive activity may yield lower levels of subjective well-being; while more moderate activity levels may be optimum for enhancing subjective well-being. Note that for the happiness measure, the relationship with number of productive activities appears to be linear.

The results of the regression analyses of life satisfaction, happiness, and depressive symptoms are presented in Tables III through V.

For life satisfaction and number of depressive symptoms, we estimate six models (two bivariate and four multivariate regression models), which include separately our two measures of productive activity (total number and time commitment). One set of models estimates *levels* of subjective well-being measured at Wave 2 as a function of number of activities and time commitment, as well as the full slate of independent variables measured at Wave 1. Another set of models estimates *changes* in subjective well-being as a function of number of activities and time commitment, as well as the control variables. These models include a baseline (Wave 1) estimate of the dependent variable. In these models the coefficient for a given predictor variable may be interpreted as follows: a one unit change in the independent variable yields a given amount of change (value of beta coefficient) in the dependent variable between Waves 1 and 2, net of the set of controls.

Note also that in preliminary analyses we found a curvilinear relationship between life satisfaction and depressive symptoms dependent variables and our two measures of productive activity (see also Table II). However, after introducing our set of covariates into the models, the analyses showed only a linear relationship between subjective well-being and productive activities. Consequently, the models reported here include only linear terms for the two productive activity measures. Thus, only at a simple level of analysis is our third hypothesis supported.

We estimate models of life satisfaction using OLS regression techniques; these results are reported in Table III. The cumulative index capturing the number of productive activities is strongly related to level of life satisfaction in the bivariate model, but after controlling for the relevant covariates, number of productive activities is not related to the level of life satisfaction in a statistically significant manner. This result does not support our first hypothesis. Further, size of social support network and participation in physical activities are positively related to the level of life satisfaction, while number of health conditions is negatively related to the level of life satisfaction. The impact of the number of productive activities is not statistically significant in the model that predicts change in life satisfaction between Waves 1 and 2. The results show that life satisfaction is quite stable over time, following from the model that includes an indicator of life satisfaction at Wave 1. Further, having a larger network of

TABLE III
 OLS regression results for *Life Satisfaction* (Wave 2) regressed on productive activities indexes and selected variables (Wave 1)

Variables	b (se) (1)	b (se) (2)	b (se) (3)	b (se) (4)	b (se) (5)	b (se) (6)
PA index 1 (#)	0.044* (0.019)	0.008 (0.024)	0.006 (0.020)			
PA index 2 (h)				0.059* (0.018)	0.039* (0.021)	0.038* (0.019)
Physical activities		0.048* (0.022)	0.028 (0.021)		0.041* (0.021)	0.020 (0.020)
Social Activities		0.030* (0.015)	0.016 (0.015)		0.024 [†] (0.015)	0.010 (0.015)
Social support		0.020** (0.005)	0.013* (0.005)		0.019** (0.005)	0.012* (0.005)
Religious participation		0.022* (0.013)	0.007 (0.011)		0.021* (0.013)	0.006 (0.011)
Health conditions		-0.110* (0.045)	-0.087* (0.044)		-0.108* (0.045)	-0.085* (0.044)
Education		-0.045* (0.017)	-0.036* (0.017)		-0.050* (0.018)	-0.041** (0.018)
Age		0.006 (0.007)	-0.001 (0.006)		0.008 (0.007)	0.001 (0.006)
Female		0.088 (0.110)	0.041 (0.101)		0.108 (0.108)	0.063 (0.100)
Black		0.051 (0.144)	0.096 (0.145)		0.056 (0.144)	0.101 (0.145)
Married		0.183* (0.125)	0.032 (0.120)		0.172 [†] (0.122)	0.020 (0.117)
Life satisfaction			0.556** (0.060)			0.556** (0.060)
Intercept	5.406	4.858	3.531	5.323	4.678	3.349
R ²	0.008	0.061	0.166	0.014	0.064	0.169
Adj. R ²	0.007	0.053	0.158	20.013	0.056	0.161

Notes: Unstandardized coefficients (b) and standard errors (se).
 * $p \leq 0.05$; ** $p \leq 0.001$; [†] $0.10 \geq p \geq 0.05$, one-tailed test of statistical significance.

social support to call on in times of need predicts an increase in the level of life satisfaction over time, while poorer health and having a greater amount of education predicts a decrease in life satisfaction over time.

Our results indicate that the amount of time contributed to productive activities is positively related to the *level* of life satisfaction and change in life satisfaction from Wave 1 to Wave 2. This is evident in both the bivariate and multivariate models. Thus while the number of activities does not appear to predict the level of or change in subjective well-being as measured by life satisfaction, the amount of time commitment is statistically related to both level and change in life satisfaction. These results provide some support for our second hypothesis.

The results of our ordered logistic regression analysis of productive activity and the level of happiness at Wave 2 are reported in Table IV. The results from the first model indicate that as the number of productive activities in which an older person engages increases, there is an increase in the log-odds of happiness; however, the relationship is only statistically significant in the bivariate model: the effect is eliminated when controls are added. As participation in physical and social activities increases and the size of respondents' social support network increases, the level of reported happiness increases. Higher levels of happiness are reported for those who are married versus those who are not married. Finally, as the number of health conditions reported increases, the level of happiness decreases. The results of the models including time commitment to productive activities show that as the hours of commitment to productive activities increases, the level of happiness also increases. In the multivariate analyses of happiness, our first hypothesis is not supported but some support for the second hypothesis is attained.

The OLS regression results for the analysis of depressive symptoms and productive activity are presented in Table V. For the analysis of the number of depressive symptoms, both the number of productive activities engaged in and the time commitment to those activities are negatively related to the number of depressive symptoms reported by older persons, net of our set of controls. However, the effect is only statistically significant in the bivariate models. For the change analysis, number of and commitment to productive activities is related to depressive symptoms

TABLE IV

Ordered logistic regression results for *Happiness Scale* (Wave 2) regressed on productive activities indexes and selected variables (Wave 1)

Variables	b (se) (1)	b (se) (2)	b (se) (3)	b (se) (4)
PA index 1 (#)	0.122** (0.026)	0.029 (0.031)		
PA index 2 (h)			0.122** (0.025)	0.049* (0.028)
Physical activities		0.082* (0.025)		0.079* (0.023)
Social activities		0.056* (0.024)		0.052* (0.025)
Social support		0.032** (0.007)		0.032** (0.007)
Religious participation		0.021 (0.022)		0.021 (0.022)
Health conditions		-0.149* (0.075)		-0.146* (0.076)
Education		-0.004 (0.020)		-0.008 (0.020)
Age		0.019* (0.010)		0.021* (0.010)
Female		-0.127 (0.140)		-0.119 (0.140)
Black		0.0003 (0.150)		0.0006 (0.149)
Married		0.402* (0.124)		0.406* (0.117)
Threshold 1	-1.505*	0.494	-1.472*	0.636
Threshold 2	1.230*	3.372*	1.265*	3.520*
Model X^2	24.4**	91.7**	24.3**	94.3**
DF	2	12	2	12

Notes: Log-likelihood coefficients (*b*) and standard errors (se) * $p \leq 0.05$; ** $p \leq 0.001$; $^{\dagger}0.10 \geq p \geq 0.05$, one-tailed test of statistical significance. Happiness scale (0 = not too happy, 1 = pretty happy, 2 = very happy).

in a negative direction: however, the relationship is statistically significant in the bivariate case and is only marginally related to the number of depressive symptoms reported. In terms of the relationship between productive activities and depressive symptoms, our results do not provide strong support for either of our first two hypotheses.

Our results also show that participation in physical activity, size of social support network, and education level are negatively related to the number of depressive symptoms reported. The results also indicate that as the number of health conditions reported increases, so too does the number of depressive symptoms reported. Finally, older women report a higher number of depressive symptoms than men, net

TABLE V
 OLS regression results for number of *Depressive Symptoms* (Wave 2) regressed on productive activities indexes and selected variables (Wave 1)

Variables	b (se) (1)	b (se) (2)	b (se) (3)	b (se) (4)	b (se) (5)	b (se) (6)
PA index 1 (#)	-0.222** (0.034)	-0.061 (0.050)	-0.040 (0.041)			
PA index 2 (h)				-0.212** (0.035)	-0.061 [†] (0.045)	-0.040 (0.036)
Physical activities		-0.128* (0.049)	-0.067* (0.043)		-0.132* (0.044)	-0.069* (0.037)
Social activities		-0.019 (0.025)	0.0001 (0.021)		-0.020 (0.025)	-0.0003 (0.022)
Social support		-0.024* (0.010)	0.0007 (0.009)		-0.024* (0.010)	0.0007 (0.008)
Religious participation		0.016 (0.020)	0.016 (0.017)		0.016 (0.019)	0.016 (0.016)
Health conditions		0.339** (0.053)	0.091* (0.039)		0.335** (0.053)	0.088* (0.038)
Education		-0.102* (0.031)	-0.072* (0.026)		-0.101* (0.030)	-0.071** (0.026)
Age		-0.003 (0.014)	0.002 (0.013)		-0.003 (0.015)	0.002 (0.013)
Female		0.382* (0.190)	0.280* (0.187)		0.394* (0.180)	0.289* (0.178)
Black		0.031 (0.215)	0.036 (0.196)		0.035 (0.214)	0.039 (0.197)
Married		-0.084 (0.199)	0.280 [†] (0.187)		-0.104 (0.196)	0.103 (0.176)
Depressive symptoms			0.492** (0.037)			0.491** (0.037)
Wave 1 (log)						
Intercept	4.426	5.077	2.370	4.441	5.151	2.414
R ²	0.057	0.140	0.345	0.053	0.141	0.345
Adj. R ²	0.056	0.133	0.338	0.052	0.133	0.339

Notes: Unstandardized coefficients (b) and standard errors (se). * $p \leq 0.05$; ** $p \leq 0.001$; [†] $0.10 \geq p \geq 0.05$, one-tailed test of statistical significance.

of the influence of productive activity and the control variables in the model. In the following section we summarize our results and discuss them in light of current research and theory.

DISCUSSION

Our primary goal for this study was to examine the impact of a wide range of productive activities on several measures of subjective well-being for a sample of older persons in the U.S. While the amount of attention to the study of productive activity in later life has accelerated recently and some researchers have begun to establish empirical links between productive activity and well-being, we contend it is appropriate to begin to examine how the full constellation of activities and the time committed to these activities impacts subjective well-being. This is pertinent because older persons typically engage in more than one activity during their later years. To our knowledge, this paper is among the first to address these issues.

The results of our analyses provide partial support for two of our three hypotheses. Our first hypothesis, that participation in a greater number of productive activities would be positively related to subjective well-being, was confirmed only at the bivariate level. After controlling for other domains of activity, social support, health and demographic characteristics, the impact of number of productive activities on subject well-being was reduced to statistical insignificance (although the effects were in the expected direction). We find support for the second hypothesis in that the greater the time commitment to productive activities, the greater the level of and improvement (change) in life satisfaction over time. Also, higher levels of time commitment to productive activities are associated with higher levels of happiness. Finally, we find a moderately statistically significant relationship between hours committed to productive activity and level of depressive symptoms. While our third hypothesis, that there would be a curvilinear effect of productive activities on subjective well-being, received some support when we cross-tabulated number of productive activities with life satisfaction and depressive symptoms, a more rigorous evaluation of this hypothesis within a multivariate regression framework did not support this expectation.

In general, we find that engagement in and commitment to productive activities later in life is somewhat beneficial to subjective well-being within the context of our research design. These findings are consistent with the existing research that suggests multiple roles, as reflected by participation in productive activities, leads to a better quality of life, possibly through increases in social integration and improvements in self-esteem and self-efficacy (see Adelman, 1994; Jackson et al., 1993; Morrow-Howell et al., 2003). The results also seem to support the role enhancement perspective and do not provide support for the role strain or role conflict perspectives.

Moreover, the results of our change analyses suggest that life satisfaction and self-report of depressive symptoms are fairly stable conditions. Such stability may represent actual consistency in these social psychological domains, or it may represent an underreporting of negative conditions – a hesitation by individuals to admit a sense of failure or problems with mental health. Further, we find that our measures of subjective well-being are related to physical and social activities and number of health conditions, findings that have been observed in other research (Glass et al., 1999). Our finding that increased social support increases subjective well-being is also consistent with social integration theory (Durkheim, 1951; Pillemer and Glasgow 2000; Rosow, 1967). Social integration theory suggests that social networks generally improve quality of life, including mental and physical health (Moen et al., 1992; Verbrugge, 1983).

Our definition of productive activity specifically focused on activity that is embedded in social networks which follows our central thesis that productive activity that is social has a positive effect on well-being. This definition means that we did not include housework in our measure because it is typically accomplished in isolation as a non-social activity. Also, as we noted above about 97% of the sample reported participating in some level of housework. Had we been able to include housework in our analysis, and if housework does have positive effects on well-being, then we might expect even stronger relationships among our measures of productive activity and well-being. In future research, analysts may want to pursue this issue more thoroughly.

A better understanding of the central issues in this study may also be enhanced in future research efforts by attention to some additional issues. First, a wider range of indicators of subjective well-being should be considered (e.g., morale, self-esteem, self-efficacy). After

this is accomplished, more confidence may be generated for the conclusions drawn from this analysis. Second, the indicators of life satisfaction and happiness in the ACL are less than optimal because they are based on global questions in the survey. It would be helpful to have multiple indicators of life satisfaction and happiness constructs so that the complex nuances of the conceptualization of these measures could be attained. In addition, researchers will want to extend this analysis by examining a range of specific domains of life satisfaction (e.g., health, marriage, family, neighborhood; see Michalos et al., 2001). Third, when more recent data sources become available that include high quality measures of the range and commitment to productive activities as well as measures of subjective well-being with stronger psychometric qualities, it will be useful to replicate the analyses in this study to compare results. Finally, the influence of engagement in multiple productive activities and the intensity of that engagement for well-being should be extended to analyses of physical health and mortality.

APPENDIX A

Comparison of characteristics of respondents in study sample (both waves) with Wave 2 non-respondents (attriters)

	Mean		Percent	
	Wave 1 only	Both waves	Wave 1 only	Both waves
Married			59%	63%
Black			11%	9%
Female*			52%	61%
Age*	73	69		
Education*	10	11		
Productive activity index 1*	3.10	4.78		
Productive activity index 2*	3.31	5.06		
Social activity index*	7.68	9.04		
Physical activity index*	4.08	5.06		
Religious participation index	6.87	6.83		
Social support*	7.39	8.81		
Health conditions*	2.22	1.86		
Completely or very satisfied w/life*			71%	73%
CES-D*	7.15	6.50		

* $p < 0.05$; continuous variable comparisons evaluated with t -tests, categorical variable comparisons evaluated with χ^2

APPENDIX B

Coding of dependent and independent variables

Variable	Coding/question wording/index components
<i>Dependent variables (Wave 2)</i>	
Life satisfaction	"How satisfied are you with your life as a whole these days?" 1 = completely dissatisfied; 4 = neutral; 7 = completely satisfied
Happiness	"Taking all things together how would you say things are these days...?" 0 = not too happy; 1 = pretty happy; 2 = very happy
Depressive symptoms	11-item CES-D score (range: 0–11)
<i>Independent variables (Wave 1)</i>	
Productive activity index 1 (number of activities)	Total # of productive activities participated in (range: 0–16) <i>Paid Work:</i> regular/irregular employment <i>Volunteering:</i> religious/political/educational/senior group/other <i>Caregiving:</i> acute or chronic care for friend/relative/neighbor <i>Informal Helping:</i> errands/housework/childcare/other <i>Do-it-yourself:</i> home improvement/canning/yard work/car repair
Productive activity index 2 (amount of time commitment)	Level of commitment in hours (grouped) to productive activities (range: 0–20) Hours of paid work over last 12 months ("none" 0 = no hours; "low" 1 = 1–1000 h; "medium" 2 = 1001–1999 h; "high" 3 = 2000 or more hours) Caregiving, volunteering, informal helping, and do-it-yourself hours over last 12 months ("none" 0 = no hours; "low" 1 = 10 or 30 h; "medium" 2 = 60, 80 or 120 h; "high" 3 = 200 or more hours)
Social activity	Level of participation in social activities (range: 0–15) <i>Talk on Phone/Visit with Friends/Attend Meetings</i>

APPENDIX B

Continued

Variable	Coding/question wording/index components
Physical activity	Level of participation in physical activities (range: 0–9) <i>Work in Garden/Active Sports/Take Walks</i>
Social support	Size of social support network (range: 0–40) <i>“About how many friends or other relatives do you have whom you could call on for advice or help if you needed it?”</i>
<i>Control variables</i>	
Health conditions	Total # of health conditions self-reported (range: 0–7) <i>arthritis/rheumatism/lung disease/hypertension/heart attack/heart trouble/diabetes/cancer/problems with circulation, corns, calluses/stroke/broken bones/urinary incontinence</i>
Age	Age in years
Education	Highest year of education
Religious participation	Sum of three indicators: religious service attendance, read religious books, and watch or listen to religious programming (1 never...6 more than once a week) (range: 0–15)
Married	1 = married; 0 = other
Black	1 = black; 0 = other
Female	1 = female; 0 = male

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