Published in final edited form as:

Aging Ment Health. 2009 September ; 13(5): 635–647. doi:10.1080/13607860802534633.

It's all in how you view it: Pessimism, social relations, and life satisfaction in older adults with osteoarthritis

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Abstract

Objectives—Current treatments for osteoarthritis (OA) continue to leave those burdened by the condition with pain and disability which affects physical and psychological well-being. The present study examines other psychosocial factors, such as dispositional personality and social relationships, in order to investigate their influence on the well-being of 160 older adults with OA (80% women).

Method—Older adults were recruited for self-reported knee or hip OA. Participants completed self-report measures of optimism and pessimism, social support, social strain, and life satisfaction using the computer program MediaLab. Measures were taken twice 9–12 months apart.

Results—Results showed that, both cross-sectionally and longitudinally, pessimism was related to lower social support and higher social strain. In addition, pessimism was mediated by social support in its relationship to life satisfaction.

Discussion—Our models support the combined roles of pessimism and social support influencing life satisfaction over time. Future interventions may want to concentrate on improving the social relationships of people with OA to enhance psychological well-being.

Keywords

life satisfaction; pessimism; social support; osteoarthritis

Introduction

Osteoarthritis (OA) is the most common chronic disease among older adults (Felson & Zhang, 1998) and is characterized by progressive joint degeneration, particularly in weight-bearing areas such as the knee or hip (Creamer, Flores, & Hochberg, 1998). The most prominent symptoms associated with OA are physical disability and pain (Bookwala, Harralson, & Parmelee, 2003; Buckwalter, Saltzman, & Brown, 2004; Centers for Disease Control and Prevention, 2006). In particular, pain plays a considerable role in daily coping with OA (Blalock, DeVellis, & Giorgino, 1995). Health researchers have found that pain affects not only physical functioning but also psychological well-being. For example, patients with chronic lower back pain report a lower quality of life compared with patients with life-threatening illnesses (Smith, Carmody, & Smith, 2000). Specific to OA, the pain and disability resulting from joint degeneration has been associated with more depressive symptoms (Bookwala et al., 2003; Penninx et al., 1997) and lower life satisfaction (Germano, Misajon,

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& Cummins, 2001). Thus, similar to other conditions, the physical symptoms of OA can negatively impact psychological outcomes.

Current treatments for OA have had only moderate success assuaging pain and other physical symptoms. Drug-therapy, such as the use of non-steroidal anti-inflammatory drugs, shows only a small amount of pain relief from arthritis when compared with placebo (Brandt, 2004; Creamer, 2000). Additionally, long term pain medication use carries risks such as gastrointestinal problems and renal damage (Brandt, 2004). Furthermore, arthroscopic surgery shows no better pain outcomes than placebo surgery in randomized clinical trials (Brandt, 2004; Mosely et al., 2002). Although joint replacement surgery for knees and hips is available and largely successful, joint replacement surgery is usually only an option for those most severely affected. Further, some aspects of OA are not currently surgically treatable (Felson, 1993), and depending on the time frame of survival after replacement surgery, the new joint may fail as well, leading to continued disability and risk for negative psychological well-being. The lack of effective treatment options, coupled with the high prevalence of OA for older adults, suggests a need for research on social and psychological resources that may help alleviate symptoms and improve psychological outcomes. In particular, we will address the roles of personality dispositions and social relations because of the established links between these domains and well-being, which we review below.

Personality

Although personality can be defined in many ways, Scheier and Carver (1987) view personality as the dispositional tendency to expect a certain outcome. For example, one can be optimistic and expect positive outcomes, or one can be pessimistic and anticipate negative outcomes. Higher optimism has been linked to positive health outcomes, including faster rates of recovery for post-bypass cardiac patients (Scheier & Carver, 1987) and greater physical therapy progress in chronic low back pain sufferers (Harkapaa, Jarvikoski, & Estlander, 1996). In contrast, higher pessimism has been related to negative health outcomes such as poorer cardiac health (Bennett & Elliot, 2005) and higher human immunodeficiency virus ribonucleic acid (HIV RNA) levels over time (Milam, Richardson, Marks, Kemper, & McCutchan, 2004).

Specific to OA, Brenes, Rapp, Rejeski, and Miller (2002) investigated the physical performance of older adults with OA on a number of tasks including walking up stairs and getting out of a car. After controlling for demographic variables and pain, Brenes et al. found that pessimism was related to poorer performance on all of the physical tasks, while optimism was related to only slightly better performance on the walking task. These results suggest that pessimism may be more influential than optimism when considering adaptation to OA. These results further indicate that optimism and pessimism play unique roles in the physical presentation of OA and that the variables should be evaluated separately, rather than as one bipolar optimism score. In fact, a recent factor analysis has revealed the independence of optimism from pessimism, especially among older adults (Kubzansky, Kubzansky, & Maselko, 2004).

Optimism and pessimism also have unique relationships to psychological well-being. Higher optimism is related to lower levels of depression for patients in a variety of health contexts, including cardiac patients (Scheier & Carver, 1987), pregnant women (Fontaine & Jones, 1997), and breast cancer survivors (Trunzo & Pinto, 2003). Conversely, pessimism has been associated with poorer psychological well-being, including higher depressive symptoms in middle-aged women (Bromberger & Matthews, 1996), hospital doctors (Clarke & Singh, 2005), and HIV patients (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). Thus, since people with OA experience a heightened risk for negative psychological functioning similar to other chronic illnesses (e.g. Penninx et al., 1997), it is important to investigate optimism and pessimism in people with OA when considering well-being.

Social relations

Thus far, we have concentrated on the roles of pain and optimism and pessimism in the psychological well-being of older adults with OA. However, another domain known to have implications for well-being is social relations, particularly the level of perceived social support and social strain. Social support can be viewed as the emotional or tangible assistance that one receives or can expect from others (Cohen, 2004). Social support is theorized to buffer against illness by providing the person with coping strategies (Cohen, 2004). Specifically, the support can be beneficial by reducing or eliminating the physiological, affective or behavioral response to stress as well as by modifying the negative effects that stress can have on health. Thus, social support has been linked to better cardiovascular functioning and increased immune function (for a review see Uchino, Uno, & Holt-Lunstad, 1999). Psychologically, social support can result in greater life satisfaction (Kahn, Hessling, & Russell, 2003) as well as buffer against depression by providing people with emotional and instrumental resources that they can use to cope (Cohen, 2004).

Social strain, on the other hand, is characterized by the negative interactions that one has with others that cause emotional hurt or unpleasant affect (Ruehlman & Karoly, 1991). Social strain can act as a source of stress, influencing health (Burg & Seeman, 1994), and social strain has been associated with increased physical symptoms for a number of conditions including HIV (Taylor et al., 2000) and rheumatoid arthritis (Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991). Psychologically, social strain has also been linked to higher levels of distress and depressive symptoms in people with arthritis (Finch, Okun, Barrera, Zautra, & Reich, 1989; Revenson et al., 1991; Sherman, 2003) but has been understudied in the specific context of OA. Thus, a careful examination of social relations for their potential link to the psychological well-being of people with OA would fill a critical gap in the literature.

Links between personality and social relations

While optimism and pessimism, as well as social support and social strain, are linked to both physical and psychological well-being, it is also possible that these factors can influence each other. For example, researchers theorize that optimists may be more skilled at starting and maintaining relationships, thus affording them large social networks which could provide more support (Geers, Reilley, & Dember, 1998; Norem and Chang, 2002). In turn, the increased support could buffer against stress and lead to greater well-being (Cohen, 2004). On the other hand, pessimists may be rejected by their peers and, thus, become socially isolated (Peterson & Bossio, 1991). It follows that an absent or poor-quality social network may deprive pessimists of the resources to cope with stressors, resulting in poorer well-being. Furthermore, pessimists may misinterpret intended supportive social interactions as strain, also resulting in poorer well-being.

Personality dispositions additionally can affect how one's existing social relationships are viewed. For example, Srivastava, McGonigal, Richards, Butler, and Gross (2006) found that optimists perceived more support from an intimate partner than did pessimists. Since researchers have theorized that simply perceiving more support has the same beneficial effect as actual receipt of support (Barrera, 1986), the tendency to view relationships in a more positive way could lead to greater well-being, regardless of the actual support received. Because personality dispositions seem to influence both the creation and perception of social relationships, it is possible that personality indirectly affects health via social relationships.

In the context of OA, Ferreira and Sherman (2007) investigated the roles of support and optimism in mediating the influence of OA pain on depressive symptoms and life satisfaction. Their results show that the relationship of pain to depressive symptoms was mediated by support but not by optimism and that the relationship of pain to life satisfaction was mediated

by optimism but not support. This complex pattern of results suggests that further investigation of personality and social relations factors is necessary in the context of OA.

Current study

In summary, OA is a condition which affects the physical and psychological well-being of many older adults; however, current treatments have been unsuccessful in fully ameliorating the troublesome symptoms of OA which are also influential in psychological well-being. Thus, there is a need to examine other factors related to well-being in this population in order to better treat all aspects of the condition. Ferreira and Sherman (2007) showed that higher levels of optimism and social support were associated with greater psychological well-being (i.e. lower levels of depression, greater life satisfaction) for older adults with OA. However, as less research has examined the effects of pessimism or social strain in this context, the current study will examine these factors in relation to the well-being of older adults with OA. Additionally, there is evidence that dispositional personality and social relations are linked such that personality influences the creation and perception of social relationships. Therefore, it is important to examine dispositional personality in conjunction with social relations when considering well-being.

Based on previous findings, we predict that a cross-sectional model which controls for demographic variables and OA symptoms will show that more optimism, more social support, less pessimism, and less social strain are related to greater life satisfaction (see Figure 1). We predict a similar relationship longitudinally such that higher levels of baseline optimism and social support will be associated with increased life satisfaction over time while, conversely, higher levels of baseline pessimism and social strain will predict decreased life satisfaction over time. Furthermore, we predict that social relations will mediate the relationship of personality dispositions to life satisfaction, such that more optimism and less pessimism will predict more support and less strain, which will then predict greater life satisfaction both cross-sectionally and longitudinally.

Method

Participants

Participants were recruited through newspaper ads, newsletters, and presentations at local senior centers. One-hundred and sixty older adults aged 58–94 years (mean, $M = 72.53$, $SD = 8.00$) volunteered to participate (80% women). All participants resided in the Boston area, spoke fluent English, and experienced pain from self-reported OA in the knee or the hip joints on at least three days per week. Most participants were Caucasian (90%), one-third of the participants were married, most participants were well educated, and the median annual income was \$20,001–50,000 (see Table 1 for demographics). Participants were informed at Time 1 that we would ask for their participation at Time 2, although they were free to decline time 2 participation.

We attempted to contact all Time 1 participants 9–12 months after their first appointment and asked them to participate in a Time 2 interview. Eighty-three percent of participants were retained for the second wave of data collection. Of the 25 participants lost to follow-up, one died, two were hospitalized or too sick to participate, eight declined further participation, and 14 were unreachable by phone or mail. There were no significant differences on any baseline variables between participants who were retained at Time 2 and those who were not.

Measures

Optimism and pessimism—were measured with the revised Life Orientation Test (LOT-R, Scheier, Carver, & Bridges, 1994). This scale consists of three items measuring dispositional optimism and three items measuring dispositional pessimism; items are scored on a five-point scale. Scores are summed for each factor (higher scores indicate more optimism or more pessimism) with possible scores ranging from 3 to 15 for each factor. Scores for this sample ranged from 6 to 15 ($M = 11.01$, $SD = 2.00$) for optimism, and 3 to 15 ($M = 7.35$, $SD = 2.73$) for pessimism. Brenes et al. (2002) previously reported acceptable reliability when scoring optimism ($\alpha = 0.73$) and pessimism ($\alpha = 0.72$) separately using a sample of older adults with OA. However, internal consistency in the present sample was low for optimism ($\alpha = 0.54$) but acceptable for pessimism ($\alpha = 0.74$).

Social support—was measured with the 19-item Medical Outcomes Study – Social Support Survey (MOS-SSS, Sherbourne & Stewart, 1991), operationalizing respondents' perceived availability of specific kinds of help with four subscales: emotional/informational support, affection, tangible support and positive interactions. Items use a five-point scale; scores are added such that higher scores indicate more available social support. Possible scores for each subscale reflect the ranges in the current sample: emotional/informational support ranged from 8 to 40 ($M = 29.14$, $SD = 7.70$), affection ranged from 3 to 15 ($M = 11.08$, $SD = 3.23$), tangible support ranged from 4 to 20 ($M = 13.73$, $SD = 4.35$), and positive interaction ranged from 3 to 15 ($M = 11.28$, $SD = 2.97$). Sherbourne and Stewart reported high validity and internal consistency for the subscales. Analyses in the present sample also revealed high subscale reliability (tangible $\alpha = 0.89$; affection $\alpha = 0.91$; emotional/informational $\alpha = 0.96$; positive interaction $\alpha = 0.93$).

Social strain—was measured with the 18-item Test of Negative Social Exchange (TENSE, Ruehlman & Karoly, 1991), which measures unsupportive actions by, and negative interactions with, people involved in the participant's life. Participants rate how often, in the last month, they felt that people in their lives were hostile or impatient with them, were insensitive, interfered, and ridiculed them on a four-point scale. Scores are summed such that higher scores indicate more social strain, and scores in the present sample reflect the ranges of possible scores for each subscale. Scores for the hostility/impatience subscale ranged from 6 to 24 ($M = 8.54$, $SD = 3.72$), for the insensitivity subscale from 5 to 20 ($M = 7.35$, $SD = 2.78$), for the interference subscale from 4 to 16 ($M = 5.46$, $SD = 2.05$), and for the ridicule subscale from 3 to 12 ($M = 3.53$, $SD = 1.22$). Ruehlman and Karoly reported acceptable subscale reliability. Current analyses also revealed acceptable Cronbach's alphas ($\alpha = 0.92$ for hostility/impatience, $\alpha = 0.81$ for insensitivity, $\alpha = 0.75$ for interference, and $\alpha = 0.75$ for ridicule).

Life satisfaction—was measured with the Life Satisfaction Inventory (LSI, Neugarten, Havighurst, & Tobin, 1961), which asks participants to report their agreement with 17 statements about life in general on a five-point scale. Items are summed with higher scores indicating more life satisfaction. Possible scores range between 17 and 85. The scores for this sample ranged from 27 to 80 ($M = 59.71$, $SD = 9.17$). Neugarten et al. have shown the LSI to be a reliable and valid measure of life satisfaction, and reliability for the current sample was high ($\alpha = 0.85$).

Perceived osteoarthritis severity—was measured with four items asking participants to rate the severity of their OA symptoms on an 11-point scale (0 = none, 10 = severe). Items were: 'How much pain have you had in the past week?', 'How much stiffness did you experience in the past week?', 'How much difficulty did you have with physical activities you wanted to do over the past week because of your osteoarthritis symptoms?', and 'Considering

all the ways that osteoarthritis affects you, rate how you are doing on the following scale'. A composite severity score was computed by summing participants' responses to all items, with a higher score indicating more perceived OA severity. Possible scores range from 0 to 40 (identical range of scores for this sample, $M = 18.50$, $SD = 7.86$). Reliability in this sample was high ($\alpha = 0.83$).

Physical disability—was measured with a physical disability measure from the Fitness and Arthritis in Seniors Trial (FAST, Ettinger et al., 1997). The measure consists of 23 items asking participants to rate the amount of difficulty, in the past month, they have had with daily activities because of their arthritis. Participants rate each item on five-point scale. We added a sixth option, 'I do not usually do this activity for other reasons unrelated to my arthritis', to distinguish people who did not perform an activity because of their physical condition from those for whom the activity was not applicable for other reasons (e.g. they did not have any stairs in their home). Responses are summed with a higher score indicating a higher level of physical disability in performing daily activities. Possible scores range from 0 to 115. One item from the scale ('How difficult was it to take care of a family member?') was deleted from analyses due to a high frequency of selecting the 'I do not usually do this activity' option (36.6%), thus changing the possible range of scores to 0–110. The range of scores for this sample was 22–79 ($M = 38.01$, $SD = 11.31$). Reliability for the original disability subscale is high (Ettinger et al., 1997), and reliability for the present modified scale was also high ($\alpha = 0.88$).

Pain—was measured with the Short-Form McGill Pain Questionnaire (SF-MPQ, Melzack, 1987), a 15-item scale consisting of words people have used to describe their pain. Participants rate the extent to which they have experienced each type of pain in the last three days on a four-point scale (0 = I have not experienced this type of pain, 3 = Severe). Responses are summed for a total intensity score with possible scores ranging from 0 to 45. The range of scores for this sample was 0–43 ($M = 14.02$, $SD = 9.47$). The SF-MPQ has a high intra-class correlation (0.96 for total pain intensity, Melzack, 1987). Cronbach's alpha in this sample was high ($\alpha = 0.90$).

Procedure

Participants were recruited through advertisements and group presentations at senior centers and senior housing. The ads and presentations described a study on adapting to osteoarthritis. Eligibility criteria included: age over 55 years, self-report of OA in the hip(s) and/or knee(s), self-reported pain in the hip(s) and/or knee(s) on at least 3 days of the past week, English-speaking, and residing in the greater Boston area for the next year. Those with recent joint replacement surgery were not excluded, nor were participants excluded if they had had joint replacement during the course of the study, although this information was tracked. Interested volunteers were pre-screened over the phone and, if eligible, completed the interview at a time and place of their choosing. After an informed consent process, the experimenter explained how to use the computer to record answers and allowed participants to practice with several sample questions to adjust to the computer format.

The survey was conducted on the Windows research software MediaLab (Empirisoft), which presented individual questionnaires in random order for the first half of the survey, and fixed order for the second half. Thirty-one participants chose paper surveys for two reasons: either discomfort using a computer or because they participated in a small group interview where there were not enough computers for each participant.¹ The order of individual questionnaires within the paper surveys was not randomized. When they completed the survey, participants were debriefed and given a \$20 honorarium. Identical procedures were followed for Time 2.

Analysis plan

In order to examine the relative contributions of optimism, pessimism, social support and social strain to life satisfaction, variables were examined in structural equation models using AMOS 6.0 software (Arbuckle, 2004). Because multiple indexes of fit are preferable when examining how well data fit structural equation models (Byrne, 1998), we reported the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Tucker–Lewis Index (TLI)/Non-Normed Fit Index (NNFI) (Boomsma, 2000). The RMSEA is an index of fit that takes the error of approximation of the population into account. Values less than 0.05 reflect good fit, values less than 0.08 reflect reasonable fit, and values greater than 0.10 indicate poor fit (Browne & Cudeck, 1993). The CFI reflects the degree to which an independent model matches the observed data, with values greater than 0.95 indicating acceptable fit, and values greater or equal than 0.97 indicating good fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003). The TLI/NNFI is based on a comparison of a null model with the hypothesized model, with indexes greater than 0.95 indicating acceptable fit, and values greater than 0.97 indicating good fit (Schermelleh-Engel et al., 2003). Byrne (1998) recommends that structural equation models should be estimated using sample sizes which have at least 10 participants per path; our sample sizes (baseline and follow-up) exceed this criteria for all models estimated.

To control for the effects of chance when conducting multiple significance tests simultaneously, we adopted the False Discovery Rate (FDR) method (Benjamini & Hochberg, 1995; Keselman, Cribbie, & Holland, 1999) for determining the statistical significance of a path coefficient. In accordance with others who have applied this method to structural equation modeling (Lackner, Jaccard, & Blanchard, 2004), a family of tests was defined as the path coefficients leading from the exogenous variables to a given endogenous variable.

Results

Preliminary analyses

First, variables were examined for normality of distribution. The social strain subscales (see Method) were highly skewed such that participants reported low social strain. A log 10 transformation of the strain subscales yielded greater similarity to the normal curve, thus, these transformed strain subscales were used in all further analyses. All other variables in the analyses were normally distributed. Second, bivariate correlation analyses were conducted between variables (see Table 2). Based on patterns of correlation, in subsequent models we controlled for severity of OA symptoms, pain and physical disability. Third, we examined our hypotheses using Hierarchical Multiple Regression (HMR) analyses (available upon request). Based on the patterns supported by HMR, we further examined our hypotheses using the more sophisticated and precise measurement tool of Structural Equation Modeling in order to confirm our results from HMR with more accurate statistics. Thus, our final preliminary analyses examined measurement models for each latent construct (also available upon request) to ensure that each latent variable was being appropriately measured by corresponding manifest indicators. Because optimism, pessimism and life satisfaction had only one manifest indicator of their corresponding latent variables, error variance was estimated using the following standard calculation: $(1 - \text{the reliability for the measure}) \times \text{the variance of the measure}$. For latent constructs with multiple indicators, the error variance was estimated by the program.

¹There were several significant differences between responses from paper surveys and responses from computer surveys: Participants who completed paper surveys reported significantly higher optimism ($t(137) = 2.13, p < 0.05$), significantly higher pessimism ($t(137) = 2.37, p < 0.05$), significantly higher physical disability scores ($t(151) = 2.77, p = 0.05$), significantly lower education ($\chi^2(1) = 13.07, p < 0.01$), significantly lower income ($\chi^2(1) = 12.75, p < 0.01$), and were significantly less likely to be married ($\chi^2(1) = 6.15, p < 0.05$). Participants who completed paper surveys also reported marginally more pain ($t(151) = 2.77, p < 0.10$) and marginally more severe OA symptoms ($t(151) = 1.97, p < 0.10$).

Hypothesized structural equation models

Hypothesized full cross-sectional mediation model—We first examined the hypothesized cross-sectional model at Time 1 (see Figure 2) in which social support and strain served as the mediators of the relationship between optimism and pessimism to life satisfaction. Hence, we predicted that higher optimism and lower pessimism would predict higher life satisfaction directly, as well as indirectly, through higher social support and lower social strain. Because of power restrictions, we reduced the number of paths in our hypothesized model with two modifications. First, we removed optimism as a predictor due to the low reliability of this measure. Second, based on patterns of correlation, we removed some of the demographic control variables from the models, retaining only the variables denoting OA symptoms.

Modified cross-sectional mediation model—In the modified cross-sectional mediation model examining Time 1 data (see Figure 3), social support mediated the relationship of pessimism to life satisfaction after controlling for the severity of OA symptoms, physical disability and pain. Higher pessimism predicted lower life satisfaction ($\beta = -0.63$), lower social support ($\beta = -0.35$), and higher social strain ($\beta = 0.55$). Higher social support also predicted higher life satisfaction ($\beta = 0.18$), and the indirect effect of pessimism on life satisfaction through social support was -0.06 , suggesting that higher pessimism is associated with lower social support, which is associated with lower life satisfaction in turn. The modified cross-sectional mediation model explained 50% of the variance in life satisfaction and fit the data adequately ($\chi^2(62, N = 160) = 108.57, p < 0.001$; RMSEA = 0.07; CFI = 0.95; TLI = 0.93).

Longitudinal mediation model—An ideal test of mediation requires at least three waves of data, e.g. baseline pessimism predicting Time 2 support and strain predicting Time 3 life satisfaction. Because we only had two waves of data, we examined changes in our dependent variable, life satisfaction, by predicting Time 2 life satisfaction while controlling for baseline life satisfaction. In the longitudinal model (see Figure 4) based on the modified cross-sectional model, we found evidence for mediation that was consistent with the cross-sectional model. Specifically, after controlling for OA symptoms, baseline social support mediated the relationship of baseline pessimism to follow-up life satisfaction (while controlling for baseline life satisfaction), such that higher pessimism predicted lower social support ($\beta = -0.35$) and higher social strain ($\beta = 0.55$). Consistent with the cross-sectional model, only higher social support predicted higher life satisfaction ($\beta = 0.32$) in the longitudinal model. Furthermore, the direct path from Time 1 pessimism to Time 2 life satisfaction was not significant in the longitudinal model, and the indirect effect of pessimism on life satisfaction via social support was -0.11 , providing further support for our hypothesis that pessimism influences life satisfaction indirectly via social support. Because there was so little change in life satisfaction over time, and because the longitudinal model provides consistent results with the cross-sectional model, we have adopted more liberal conventions to evaluate the fit of the longitudinal model. The longitudinal model explained 65% of the variance in Time 2 life satisfaction and fit the data reasonably using liberal conventions ($\chi^2(75, N = 160) = 183.64, p < 0.001$; RMSEA = 0.09; CFI = 0.89; TLI = 0.86).

Alternative mediation models

We based our hypotheses on the common understanding that personality remains stable across the lifespan (McCrae et al., 2000). Based on this understanding, logic and theory support hypotheses in which stable personality characteristics, including optimism and pessimism, predict less stable factors, including social relations. However, some research supports the opposite pattern that social relationships can influence personality (e.g. Symister & Friend, 2003). Therefore, in order to provide a more complete understanding of the associations between the factors under consideration, we constructed alternative models in which optimism and pessimism mediated the relationship of support and strain to life satisfaction.² However,

based on the stronger theory and better fit statistics supporting the hypothesized models, we assert that social support serves as a mediator of the relationship of pessimism to life satisfaction in both cross-sectional and longitudinal analyses for this sample of older adults with OA.

Discussion

In the present study, we examined the influence of dispositional personality and social relations on the well-being of a group of older adults with OA. Results indicate that, cross-sectionally, a pessimistic outlook was associated with lower levels of social support and higher levels of social strain. Pessimism also influenced life satisfaction indirectly through social support with higher pessimism resulting in lower social support, which, in turn, was associated with lower life satisfaction. Longitudinally, initial pessimism also predicted decreased social support and increased social strain over one year. Pessimism also indirectly predicted life satisfaction via social support over time. Interestingly, only social support (not social strain) predicted increased life satisfaction in both models.

Personality

Contrary to our hypotheses, optimism could not be used in either the cross-sectional or longitudinal model because of the relatively low internal consistency ($\alpha = 0.54$). However, it is also possible that pessimism is the more important personality characteristic than optimism for influencing physical and mental health outcomes. For example, Brenes et al. (2002) found that higher pessimism in participants with OA was related to poorer performance on four physical tasks (e.g. walking, lifting/carrying a weight) while higher optimism was only related to better walking performance. Additionally, Robinson-Whelen, Cheongtag, MacCallum and Kiecolt-Glaser (1997) found that only pessimism predicted anxiety, stress and self-reported health after a year in a group of older adults. These studies and the current study indicate that pessimism is a more powerful predictor of outcomes than optimism. Thus, people with OA who demonstrate higher levels of pessimism may be at risk for poorer physical and psychological well-being.

Social relations

Congruent with our hypotheses, we found that social support showed both cross-sectional and longitudinal relationships to well-being. This suggests that it is important to consider the effects of social relationships when examining a medical condition like OA. It could also indicate that future interventions should concentrate on providing people with OA access to supportive individuals and groups that could improve their psychological well-being.

Contradictory to our hypotheses, social strain was not related to life satisfaction in either model. In terms of the lack of findings for social strain, the sample for the current study showed very low levels of social strain at both baseline and Time 2. Thus, the absence of strain in the group may explain the lack of a relationship to life satisfaction. Another plausible explanation can be described by the Domain-Specific Model by Ingersoll-Dayton, Morgan and Antonucci (1997), which suggests that positive social exchanges are solely associated with positive affect and negative exchanges with negative affect. Because life satisfaction is an outcome with a positive valence, only a positive social relationship (support) would be associated with this outcome according to the Domain-Specific Model. It is also possible that social strain has more influence on 'negative' aspects of well-being (i.e. depression) and so is not as important a factor

²The alternative mediation model tested whether higher social support and lower social strain would predict lower pessimism, predicting higher life satisfaction in turn. The full alternative Time 1 cross-sectional model yielded a moderate fit to the data: $\chi^2(149, N = 160) = 251.41, p < 0.01$; RMSEA = 0.07; CFI = 0.91; TLI = 0.84, although with slightly poorer fit statistics than the hypothesized model. However, the alternative longitudinal model did not fit the data well ($\chi^2(162, N = 160) = 357.00, p < 0.01$; RMSEA = 0.09; CFI = 0.85; TLI = 0.80). The details of these alternative models are available upon request from the authors.

when considering life satisfaction. Future research on social strain may provide insight into the nature of its particular relationship with the components of well-being.

Mediation

Our results support a mediation model in which social support mediates the impact of pessimism on life satisfaction. Specifically, our findings indicate that people with higher levels of pessimism reported lower levels of support and, in turn, report lower levels of life satisfaction over time. This model, starting with a personality variable which exerts influence through social relationships, is consistent with previous findings that pessimists may show lower levels of support due to perceiving less peer support (Srivastava et al., 2006) or more actual rejection from peers (Peterson & Bossio, 1991). This lack of support can then lead to poorer well-being as consistent with previous work (e.g. Cohen, 2004; Kahn et al., 2003). Thus, our model suggests that interventions based on social relationships will need to take into account personality dispositions as well, since the concepts have some interlocking influence. In other words, personality and social relations do not exist in a vacuum separate from each other.

Contrary to our hypotheses, our mediation models did not show a significant influence of social strain. The lack of findings for this factor has previously been discussed. However, this lack may also suggest a need for continued research in the area of strain to further determine its nature and accurate relationship to dispositional personality and well-being.

Strengths and limitations

The present study utilized several different techniques in order to achieve the soundest results possible. First, we examined the research questions both cross-sectionally and longitudinally to determine whether relationships hold over time and, subsequently, their relative accuracy. In addition, we used the statistical technique of structural equation modeling (SEM), which accounts for more error variance than other techniques are able. Nevertheless, the current sample consisted of mainly high functioning, Caucasian, female older adults with relatively high levels of life satisfaction, high levels of social support, low levels of social strain and lower levels of self-reported OA severity (see Table 1). A more diverse sample with poorer outcomes such as greater OA severity or more social strain may show differing results with regards to well-being. In order to access such a sample, focus groups may be beneficial in determining the ways that participants can be accommodated so that they will remain comfortable but still be able to participate in research on their 'high-pain' days. However, the best way to gain a sample that includes participants with higher disease severity and more impairment is to utilize a clinical sample, rather than a community-based one. While we acknowledge the limitations to external validity posed by our reliance on a high-functioning sample, it is important to note that clinical samples have limitations to their generalizability as well, not being reflective of the larger population of independently living older adults in the U.S.

In addition, all measures used in the present study were self-report, which could result in participant bias and/or shared method variance. SEM does partially account for variance due to measurement error, and self-report is a common method in the assessment of people with OA. However, it may be beneficial to consider alternative approaches such as home visits or video-taped social interactions to assess the quality of social relationships, clinical assessments to measure well-being, and medical diagnoses to indicate OA severity in order to provide confirming assessments along with self-reports.

Future directions and conclusions

Personality dispositions, especially pessimism, are an influential factor in the process of well-being. Thus, people with OA who demonstrate higher levels of pessimism may be especially at risk for poorer psychological well-being due to the influence of the condition, pessimism, and subsequent lack of quality social relationships. Current theories suggest that personality is a stable trait over the lifespan (McCrae et al., 2000), indicating that it may not be beneficial to attempt to change the personality dispositions of a person with OA. Therefore, it may be important for interventions to focus on other, more changeable factors.

Previous arthritis interventions such as the Stanford Arthritis Self-Management Program (Lorig, Mazonson, & Holman, 1993) have utilized self-management education, with its focus on patient self-efficacy and problem-solving, to improve chronic illness outcomes. Results indicate that, over 4 years, arthritis patients who receive self-management education show 20% less pain when compared with controls. As previously mentioned, arthritis pain is directly related to higher depression and lower life satisfaction (Bookwala et al., 2003; Germano et al., 2001, Penninx et al., 1997). Therefore, it follows logically that a reduction in pain through such interventions could result in improved well-being. Nevertheless, some self-management interventions have not found any differences in psychological well-being between intervention and control groups (Lorig et al., 1999). Thus, to improve the psychological well-being of people with OA, a new approach may be warranted.

We found that social relationship quality, particularly social support, mediated the relationship of pessimism to life satisfaction. Therefore, it may be productive to intervene to bolster the social support of people with OA so that they will have the resources to cope with the pain and disability they are likely to experience. Additionally, in order to combat the tendency for people high in pessimistic beliefs to be socially isolated (Peterson & Bossio, 1991), clinicians may want to focus on teaching social skills in order to improve social relationships. Interestingly, our results showed that social strain did not play a role in life satisfaction. Thus, future studies in OA may want to examine social strain with other components of well-being to determine whether strain is an influential factor in other psychological outcomes such as depressive symptoms.

In sum, both dispositional personality and social relations are influential in the psychological well-being of this group of older adults with OA. Pessimism appears to influence perceived levels of social support which, in turn, influence the experience of life satisfaction over one year. Attending to these psychosocial factors in the construction of interventions and treatments, as well as discovering others of importance, may improve the psychological well-being of older adults with OA and even possibly their experience of the condition.

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Figure 1.
Conceptual models: direct and indirect effects of personality on well-being.

Hypothesized Cross-Sectional Mediation Model

Figure 2.

Hypothesized full cross-sectional mediation model: higher Time 1 optimism and lower Time 1 pessimism predict more Time 1 social support and less Time 1 social strain, which predicts more Time 1 life satisfaction.

Figure 3.
 Modified cross-sectional mediation model: higher Time 1 pessimism predicts less Time 1 social support and more Time 1 social strain, which predicts less Time 1 life satisfaction.

Longitudinal Mediation Model
 Chi square= 183.64, df=75, $p < .001$
 RMSEA= .09, CFI= .89, TLI=.86
 Time 2 Life Satisfaction R square = .63
 All paths are significant ($p < .05$) using FDR adjustment.
 Standardized coefficients are reported.

Figure 4. Longitudinal mediation model: higher Time 1 pessimism predicts less Time 1 social support and more Time 1 social strain. Higher Time 1 social support predicts more Time 2 life satisfaction when controlling for baseline levels of life satisfaction.

Table 1Summary of demographic characteristics ($N = 160$).

Ethnicity		Marital status	
Caucasian	90.1%	Single	10.5%
African American	3.3%	Married	33.3%
Asian/Asian American	2.6%	Divorced/separated	28.8%
Hispanic/Latino(a)	0.7%	Widowed	27.5%
Native American/American Indian	3.3%		
<i>Education</i>		<i>Annual income</i>	
Some high school education	5.2%	Less than \$10,000	16.2%
High school diploma/GED	17.0%	\$10,001–20,000	29.1%
Some college education	23.5%	\$20,001–50,000	33.1%
Associate's degree	6.5%	\$50,001–75,000	11.5%
Bachelor's degree	12.4%	\$75,001 or more	10.1%
Some graduate education	8.5%		
Master's degree	20.9%		
Doctoral degree	5.9%		

Table 2

Bivariate Pearson correlations between all variables($N = 160$).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1 Age	1	-0.12	-0.07	-0.07	-0.04	-0.02	-0.12	0.10	0.13	-0.04	0.13	0.11	-0.04	0.13	0.00	-0.00	-0.02	-0.03	-0.03	-0.10	-0.03	-0.03	-0.07	-0.16
2 Gender		1	-0.05	-0.31**	-0.06	-0.13	0.15†	0.00	0.17*	-0.04	0.05	0.07	0.04	0.00	-0.18*	-0.12	-0.12	-0.07	-0.13	0.12	-0.09	-0.04	-0.04	-0.05
3 Ethnicity			1	0.14†	0.05	0.12	-0.05	0.02	-0.00	-0.03	0.09	-0.12	0.14†	-0.12	-0.03	-0.04	-0.04	-0.11	-0.02	0.01	0.06	-0.08	0.07	0.04
4 Marital status				1	0.09	0.32**	-0.01	-0.08	-0.13	-0.05	-0.03	-0.20*	-0.01	-0.06	0.23**	0.24**	0.19*	0.14†	0.21**	0.03	0.15	-0.08	0.13	0.05
5 Education					1	0.26**	0.02	-0.13	-0.25**	-0.19*	0.06	-0.29**	-0.01	-0.29**	0.03	-0.05	-0.01	-0.03	0.07	-0.03	0.10	-0.08	0.09	0.20*
6 Income						1	0.08	-0.12	-0.13	-0.29**	0.02	-0.29**	-0.07	-0.18*	0.08	0.04	0.04	0.03	-0.02	-0.08	-0.12	-0.25**	0.14†	0.19*
7 OA duration							1	-0.09	0.13	-0.13	0.01	0.02	0.15†	-0.06	0.08	0.09	0.06	0.09	-0.20*	-0.11	-0.10	-0.06	0.14†	0.08
8 OA severity								1	0.59**	0.63**	-0.13	0.16†	0.01	0.22**	-0.24**	0.09	0.06	0.09	-0.20*	-0.11	-0.10	-0.06	0.14†	0.08
9 Physical disability									1	0.44**	-0.07	0.22**	0.12	0.24**	-0.19*	-0.14†	-0.19*	-0.18*	0.14†	0.21**	0.13	0.22**	-0.25**	-0.31**
10 Pain										1	-0.12	0.15†	-0.07	0.37**	-0.20*	-0.13	-0.18*	-0.27**	0.27**	0.28**	0.34**	0.31**	-0.27**	-0.30**
11 Mortality											1	0.00	-0.05	-0.08	0.06	-0.01	0.01	0.03	-0.08	-0.10	-0.11	-0.11	0.07	-
12 Mode of survey												1	0.18*	0.20*	-0.04	0.01	0.04	-0.05	0.04	0.08	0.00	0.11	-0.06	-0.26**
13 Optimism													1	-0.32**	0.07	0.10	0.20*	0.11	-0.05	-0.09	-0.03	0.05	0.56**	0.36**
14 Pessimism														1	-0.22**	-0.15†	-0.29**	-0.29**	0.38**	0.36**	0.30**	0.24**	-0.54**	-0.48**
15 Tangible support															1	0.72**	0.69**	0.69**	0.04	-0.26**	-0.11	-0.16*	0.28**	0.29**
16 Affection																1	0.80**	0.81**	0.01	-0.27**	-0.07	-0.23**	0.28**	0.42**
17 Positive interaction																	1	0.84**	0.05	-0.22**	-0.13	-0.26**	0.38**	0.45**
18 Emotional/informational support																		1	-0.05	-0.26**	-0.17*	-0.27**	0.34**	0.46**
19 Hostility/impatience																			1	0.64**	0.58**	0.46**	-0.20*	-0.22*
20 Insensitivity																				1	0.50**	0.49**	-0.37**	-0.31**
21 Interference																					1	0.52**	-0.23**	-0.24**
22 Ridicule																							1	-0.22**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
23	Baseline life satisfaction																							
24	Follow-up life satisfaction																						1	0.69**

[†] $p \leq 0.1$,
* $p < 0.05$,
** $p < 0.01$.

Gender was dichotomized such that 0 = male and 1 = female, marital status was dichotomized such that 0 = single, divorced, or widowed and 1 = married, ethnicity was dichotomized such that 0 = white and 1 = other ethnicity, education was dichotomized such that 0 = up to Associate's degree and 1 = Bachelor's degree or higher, income was dichotomized such that 0 = less than \$50,000 and 1 = \$50,001 or more, and OA duration was dichotomized such that 0 = less than 2 years and 1 = 2 years or more. Correlations are also based on log 10 transformations of the social strain variables.