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The association between activity and wellbeing in later life: what really matters?

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ABSTRACT
This paper reports a study of the complex associations between older people's participation in activities and their wellbeing in later life using data from a national sample of 1,334 Jewish-Israeli retirees. Confirmatory factor analysis substantiated a division of the activities into solitary, formal and informal categories, as postulated by activity theory. The outcome measure, the latent construct wellbeing, was compiled from scores on the 12-item *General Health Questionnaire* (GHQ-12), a global measure of life satisfaction, and a measure of satisfaction with the use of time. The analysis also examined the influence of socio-economic status, health status and the quality of inter-personal relationships. 'Social relationship quality', also a latent construct, was a composite of measures of satisfaction with children, friends and neighbours and a self-rated loneliness scale. Path analysis using structural equation modelling was employed. The results showed that when the quality of social relationships was taken into account, the amount of activity had no independent effect on the respondents' wellbeing. Moreover, it was social relationship quality, a facet of informal activity that has generally been neglected in activity research, that emerged as the most influential variable in the association between activity and wellbeing. Thus, the findings provide empirical backing for the assertion that the quality of social ties matters more than activity participation *per se* as predictors of a good old age.

KEY WORDS – activity, social relationship quality, wellbeing, later life, Israel, structural equation modelling, Amos 4.

Introduction

The relationship between activity and wellbeing in later life has long preoccupied social gerontologists. Engagement in activity was among the first identified correlates of successful ageing (Havighurst and Albrecht 1953) and persists as a major wellbeing predictor in recent gerontological thought (Rowe and Kahn 1997). In fact, participation in activities was a

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central requirement in one of the first major gerontological theories of 'successful ageing' (Lemon, Bengtson and Peterson 1972). Empirical analyses over the years have variously partially verified and partly refuted the 'activity theory of ageing' (Chen 2001; Hout *et al.* 1980; Reitzes, Mutran and Verrill 1995). Nonetheless, the notion that activity is good for older people continues to guide a wide range of welfare practitioners who work with or advise older people (Reich, Zautra and Hill 1987). Given this background, it is apposite and timely to ask: what is it that really matters in the association between activity and wellbeing in later life?

The analysis reported in this article provides a new lens for the examination of long-standing questions about the benefit of activity for older people. It applies structural equation modelling to data for a sample of older Jewish-Israelis. As well as a detailed analysis of the effects of participation in different kinds of activity, the investigation also considers the impact of variations in socio-economic status, health status and social relationship quality. The analysis is therefore an in-depth examination of the dynamics that underlie the association between these two important attributes of older people's lives. It seeks to advance knowledge in this area in three ways: first, it uses confirmatory factor analysis to verify the division of activity into the three primary activity domains that were originally identified by activity theorists: formal, informal and solitary activity. Second, it examines the quality of social relationships *vis a vis* the activity indicators, to develop our understanding of the particular roles and effects of informal activity. Third, the study employs a compound latent measure of wellbeing, which includes satisfaction with one's use of time as well as more general measures of life satisfaction and psychological wellbeing. The wellbeing outcome variable has been designed specifically to study the contribution of activity to later life.

Activity and wellbeing

Early gerontology researchers maintained that activity was related to the wellbeing of older people (Havighurst, Neugarten and Tobin 1964; Kutner *et al.* 1956; Maddox 1963). Lemon *et al.* (1972) subsequently published an axiomatic statement of the activity theory of ageing in which they divided the phenomenon into three distinct realms: informal, formal and solitary activity. The theory posits that taking part in activity promotes support in the role and positive feedback on role performance. Frequent role supports in turn enhance self-esteem and personal wellbeing (Reitzes, Mutran and Verrill 1995). Lemon and colleagues hypothesised that the most intimate activities generate the greatest role support, because the responders have close acquaintance with the subjects and their capacities.

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Because informal activity is based in primary group relationships, it was believed to provide greater role-specific feedback. Their empirical analysis found that informal activity with friends was indeed related to life satisfaction, but that other kinds of informal activities were not. Formal and solitary activities were also unrelated to life satisfaction.

In a British study, Knapp (1977) found a positive association between both informal and formal activity and life satisfaction, but no association between solitary activity and life satisfaction. In a replication of the Lemon *et al.* study, Longino and Kart (1982) revealed that, even after controlling for age, gender, health and community setting, informal activity with relatives, friends and neighbours positively correlated with life satisfaction, but that formal activity negatively correlated with life satisfaction, and solitary activity was unrelated.

Subsequent theoretical papers and studies in several countries have produced inconsistent results and variable support for the tenets of activity theory. Marshall (1994), for example, criticised the emphasis of activity theory on the phenomenon of 'normal' ageing. In his opinion, the theory does not adequately address the diversity of human ageing, nor view ageing in a lifecourse perspective. A study by Reitzes, Mutran and Verril (1995) of working men and women found gender differences in the effects of activity on self-esteem, a major component in the association between activity and wellbeing. Moreover, among women, the associations between activity and self-esteem were greater when role commitment was high. On the other hand, Chen (2001) found among older people in Taiwan that life satisfaction was indeed associated with the level of activity, but not with organisational participation. In explaining how individuals adapt to changes associated with the death of a spouse and the accompanying bereavement process, Bergstrom and Holmes (2000) found support for activity theory. Zaranek and Chapleski (2005) have recently used activity theory as a conceptual framework to examine casino-gambling in a random sample of people aged 60 or more years in Detroit.

The lack of unequivocal empirical backing for activity theory requires renewed scrutiny of its original assumptions. The initial rationale was that activity reinforces elders' self-esteem and, as a result, their life satisfaction, but the finding that it is mainly informal activity that associates with life satisfaction raises a different possible explanation: it may not be the feedback derived from activity *per se* that is responsible for the wellbeing outcome, but rather the quality of the social relationships that accompany activity, particularly informal activities.

The influence of social relationships on wellbeing in later life has been widely studied. Relationships can impact upon older people's wellbeing in several ways, by their number, diversity, frequency and intensity or, in

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other words, by their structural and interactional characteristics (House and Kahn 1985; Litwin 1996; Mitchell 1969). Relationships may also promote wellbeing through the benefits that they create, particularly through the exchange of social support (Antonucci and Akiyama 1987; Cohen and Syme 1985; Ell 1984; Keyes 2002). Finally, relationships can affect wellbeing to the extent that they are meaningful to the persons who engage in them (Fung, Carstensen and Lang 2001).

Social network analyses among elderly people have for many years focused on the structural and the interactional aspects of social ties (Heller and Mansbach 1984; Levitt *et al.* 1985–86; McGhee 1985) and on the exchange of tangible or emotional support (Coward 1987; Keyes 2002; Krause, Herzog and Baker 1992). Recent studies of the social networks of older people point to the importance of subjective factors, and particularly to the perceived quality of social relationships, as the decisive dynamic in the nexus of factors that influence wellbeing in later life. A meta-analysis concluded that the quality of social contacts is more strongly related to subjective wellbeing than the frequency of such contacts (Pinquart and Sorensen 2000). Regev (1998) found in a sample of Israeli older people that the quality of relationships was independent of the social support received, and that the former was a stronger predictor of life satisfaction than the latter.

Given that relationship quality is subjective and individual, its measurement must be rooted in the perceptions of each respondent. One approach is to measure the respondents' satisfaction with their social ties, that is, the extent to which they are pleased with their social relationships (Blieszner, Usita and Mancini 1996). The examination of relationship quality may shed new light on the understanding of the association between activity and wellbeing in later life. Informal activity – the only component of activity that consistently correlates with wellbeing – encompasses social contacts, support exchanges and relationship quality. To untangle the relative effects of each of these elements, multivariate analysis is required.

Socio-demographic attributes are associated with most wellbeing scores and must therefore also be taken into account in any examination of activity and wellbeing. Particularly confounding is the positive association between life satisfaction and both education and income (Leonard 1981–82; McKenzie and Campbell 1987; Morris 1991). In Pinquart and Sorensen's (2000) meta-analysis, income emerged as a stronger correlate of wellbeing than education. Health status measures are also strong predictors of subjective wellbeing among older people (Chappell and Marshall 1992; Kennedy, King and Muraco 1983). In fact, Bowling's (1990) analysis of life satisfaction among people aged 85 or more years in

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London revealed that physical health was a stronger predictor than social network variables.

To summarise, the activity theory of ageing contends that involvement in activity positively contributes to a sense of personal wellbeing among older people. While attempts have been made to test the theory empirically, the results have not been conclusive. It is necessary to consider the relationship between activity and wellbeing in a broader conceptual framework. Our review of previous research leads to the conclusion that we must now examine the effect of activity simultaneously with social relationship quality, health and socio-economic characteristics.[1] A specific question of great interest is whether older persons' activity levels influence their personal wellbeing, or whether it is the quality of the social relationships that is more influential. The principal questions examined by the analysis reported in this article can be summarised in three hypotheses:

H1. Activity (informal, formal and solitary) is positively associated with wellbeing in later life
H2. Social relationship quality is positively associated with wellbeing in later life
H3. The quality of social ties has a stronger association with wellbeing than the extent or quantity of informal activity.

Data and methods

The data for the analysis were drawn from a 1997 national survey in Israel of people aged 60 or more years in some 3,500 households that was carried out by the Israeli *Central Bureau of Statistics* (CBS). The survey included all ethnic groups in Israel: veteran Jewish-Israelis, Arab-Israelis and recent immigrants from the former Soviet Union. Its instrument addressed many topics, including levels of involvement in activities of various kinds, inter-personal relations and selected measures of wellbeing.

The sample

The majority (over 60%) of Israel's elderly population are Jews who immigrated before 1990, and the present analysis focuses upon this group; its findings cannot therefore be extrapolated to the entire older population of Israelis.[2] There were however good reasons for the precise definition of the population of interest. The specific aim was to increase understanding of the dynamics of the association between activity and wellbeing, and this required the minimisation of confounding demographic, social and

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cultural influences. Previous studies had shown that Arab-Israelis and post-1989 immigrants from the former Soviet Union have distinctive social networks (Litwin 2005), and that native-born older Jewish-Israelis are significantly more advantaged in socio-economic terms (Litwin 2004).

Since activity theory addresses the loss of roles in old age, the analysis focuses on those who have retired from paid employment. Accordingly, from among those who immigrated before 1990, a further selection was made of those who had been but were no longer employed (and the sample did not include people who had never worked outside the home). Respondents who answered by proxy and hence were unable to report subjective satisfaction scores were also excluded. Finally, if more than one elderly person in a household unit had been included in the original survey, to ensure the independence of the observations, one was randomly selected. The resulting sample for analysis comprised 1,334 respondents.

The variables and measures

The *informal activity* domain was represented by four variables that measured the frequencies of contact with children (range 0–4), with neighbours (0–5), and with friends (0–5), and the frequency of going out for trips or visits (0–4). The *formal activity* construct also included four indicators: engagement in up to two enrichment courses (0–2), the frequencies of attendance at senior centres (0–4) and synagogues (0–4), and the frequency of volunteering through formal organisations (0–3). The *solitary activity* domain was compiled from four frequency indicators: reading books (in any language) (0–4), listening to the radio (0–3), watching television (0–3), and reading newspapers (0–4).

Social relationship quality (SRQ) was a latent construct composed of four indicators of the quality of inter-personal relations. Three reflected the respondents' satisfaction with their contacts with respectively children, friends and neighbours. The scores for all three ranged from 0 to 4; the higher the score, the greater the satisfaction. The fourth indicator was a subjective self-appraisal of loneliness, measured on a four-point scale, which was transformed so that the higher the score, the more socially connected the respondent felt to be.

The outcome of interest was the latent construct *wellbeing* compiled from three indicators: life satisfaction, satisfaction with the use of time, and psychological wellbeing. The global measure of life satisfaction was obtained by the respondents ranking the degree to which they were in general satisfied with their lives. The scores ranged from 0 to 3, and the higher the score, the greater the satisfaction. Satisfaction with the personal

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use of time among respondents was asked separately and measured on a similar scale. Such single-item measures of quality of life achieve similar associations as more complex satisfaction measures (Smith *et al.* 2004). Psychological wellbeing was measured by means of the 12-item *General Health Questionnaire* (GHQ-12) (Pot, Deeg and Van Dyck 1997). A Hebrew version was used, and the respondents indicated agreement or lack of agreement to 12 positively or negatively phrased statements, *e.g.* 'Do you feel happy on the whole?' and 'Do you ever feel there is little reason to live?' The resultant scores ranged from 0 to 12, and the higher the score, the better the psychological wellbeing (the α reliability coefficient was 0.87).

The respondents' *health status* was measured on four indicators. First, a Hebrew version of the five-item *Physical Activity Scale* (Cornoni-Huntley *et al.* 1985) indicated the degree of difficulty in carrying out five physical tasks: pushing a large object, stooping, lifting, reaching, and using a delicate instrument. The version employed by the CBS solicited a three-level response, so the aggregate scale scores ranged from 5 to 15 ($\alpha = 0.86$). The second health variable was a count of health problems from a list of six physical difficulties, *e.g.* back pain and headaches; the scores ranged from 0 to 6. The third variable was a subjective, four-point, global health rating, and the last a self-appraisal of current health status as compared to one year before, with the following responses: better (1), the same (0), or worse (-1). All four health measures were coded such that a higher score indicated better health or lesser disability. Finally, the socio-economic variables were an educational exposure or receipt measure, with six categories from 0–5 years to 16 or more years of schooling, and a nine-category income scale, from less than 1,390 NIS (new Israel shekels) (US$ 340), to over 11,099 NIS (US$ 2,710) per month.

Analytical method and test statistics

The principal analytical method was structural equation modelling (SEM) through the Amos 4 statistical program (Arbuckle and Wothke 1999). It uses conventional regression equations that calibrate the most influential statistical associations (which may be causal connections), but SEM additionally represents the impact of several variables on one or more outcomes, the structural relations, with a graphical model. The procedure has several advantages over path analysis and multiple regression. First, it takes into account the inter-relationships among the 'independent' variables and, second, it provides adequate tests of the effects after adjustments for the unreliability of the measures (Byrne 2001; Musil, Jones and Warner 1998; Vinoker and Schul 2002).

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A SEM has two elements, a measurement model and a structural model. The measurement model defines the relations between the observed and unobserved latent variables and is a confirmatory factor analysis (Byrne 2001). It was used to confirm the division of activity into informal, formal and solitary activity dimensions. The structural model defines the relations among the unobserved variables and describes the direct or indirect influences of particular latent variables on changes in the values of certain other latent variables (Byrne 2001). It was employed to clarify the association of activity and social relationships with wellbeing, controlling for income, education and health. The respective models were assessed by testing the statistical significance of the estimated path coefficients and the goodness of fit statistics for the model.[3]

Results

Four rounds of factor analyses were conducted to obtain the best model. First, Model 1 was an analysis of the entire sample using all the indicators for the informal, formal and solitary activities. As Table 1 shows, this model yielded an acceptable fit, but the loadings of one of its indicators, frequency of contact with children, proved insignificant. Since the presence of insignificant parameters increases the standard errors, a factor analysis was carried out to identify and remove insignificant indicators. To do this, the sample was split randomly in two, one half for exploration and the other for confirmatory replication. The first exploratory factor analysis (Model 2) found that another indicator, synagogue attendance, was insignificant. Consequently, a second factor analysis was executed on the exploratory sample but without the synagogue indicator. As is evident in Model 3, all the remaining indicators attained significant loadings and the model fit was improved over its predecessor. To confirm the changes in the measurement model, the refined model (Model 3) was applied to the confirmatory sample (Model 4). The results confirmed that all the indicators attained significant loadings and the fit of the model was acceptable. The results therefore suggest that, in the current study population, frequency of contact with children and synagogue attendance were unrelated to the domains of activity originally conceptualised in activity theory.

The next step was a comparison of the refined model with an alternative activity model in which all the activity indicators were loaded onto a single factor. The purpose was to confirm whether the multi-dimensional formulation of the activity theorists was preferable to a singular and unified representation of the activity phenomenon. Comparison of the

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TABLE 1. *Standardised factor loadings in the models*

Latent constructs and indicators	Model 1	Model 2	Model 3	Model 4
		Factor loadings		
Informal activity				
Going out	0.55[1]	0.52[1]	0.51[1]	0.56[1]
Contact with children	0.04			
Contact with friends	0.59***	0.61***	0.62***	0.57***
Contact with neighbours	0.30***	0.30***	0.30***	0.31***
Formal activity				
Engaging in voluntary service	0.44[1]	0.49[1]	0.51[1]	0.40[1]
Enrichment	0.39***	0.36***	0.37***	0.44***
Attending a senior centre	0.25***	0.29***	0.28***	0.20**
Attending a synagogue	0.12**	0.09		
Solitary activity				
Reading books	0.46[1]	0.43[1]	0.43[1]	0.51[1]
Watching television	0.36***	0.29***	0.29***	0.39***
Listening to the radio	0.36***	0.40***	0.39***	0.31***
Reading newspapers	0.63***	0.59***	0.57***	0.67***
		Values		
Model statistics				
Calculated χ^2	382.2***	185.6***	106.8***	142.9***
Degrees of freedom	51	41	32	32
Normed fit index (NFI)	0.98	0.98	0.99	0.98
Comparative fit index (CFI)	0.98	0.98	0.99	0.99
RMSEA …	0.070	0.073	0.059	0.072
… 90% confidence interval	0.063–0.076	0.062–0.084	0.047–0.072	0.060–0.084
Sample size	1,334	667	667	667

Notes: RMSEA: root-mean-squared error of approximation. The significance of the factor loading is based on the unstandardised metric. 1. The loading of this parameter was fixed at 1 and has no critical ratio.
Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

chi-squared values and degrees of freedom of the respective models revealed that the three-dimension activity model was a significantly better solution than the unified activity model (Table 2).[4] The dimensioned model was therefore employed in the later analyses.

Table 3 presents the inter-correlations of the three latent activity constructs as estimated by Model 3. All the activity domains were significantly associated with each other but to varying degrees. The strongest correlation was between 'formal' and 'informal' activities, and the weakest between 'formal' and 'solitary' activities. The replication by Model 4 showed similar results. In sum, the results of the refined measurement model were in accordance with the division of the activity phenomenon into three realms of action, as postulated by the activity theorists.

While the measurement model just described verified the discriminant validity of the three respective realms of activity – informal, formal and

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TABLE 2. *Comparison statistics for the variant models*

Model description	Comparison model	χ^2	df	$\Delta\chi^2$	Δdf	*p*
Activity with 1 factor (Model 1)		416.1	36	–	–	–
Activity with three factors (formal, informal and solitary)	Model 1	186.8	32	229.4	4	<0.001
Activity and social relations as a single factor (Model 2)		69.4	12	–	–	–
Activity and social relations as separate factors	Model 2	31.6	11	37.8	1	<0.001

Notes: df: degrees of freedom. $\Delta\chi^2$ is the difference in the chi-squared values of the comparative models. Δdf is the difference in number of degrees of freedom of the comparative models. See Note 4.

TABLE 3. *Correlations between the latent activity variables*

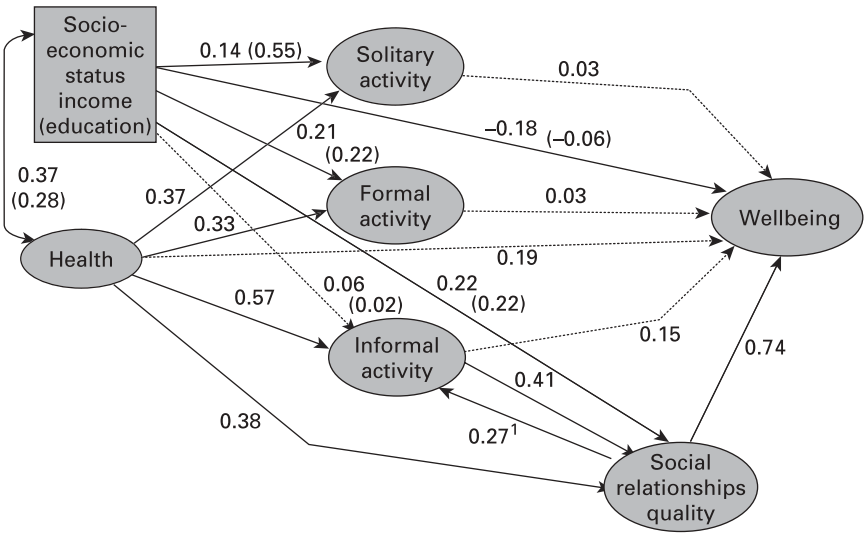
	Solitary activity	Formal activity
Solitary activity	–	–
Formal activity	0.55***	–
Informal activity	0.68***	0.76***

Note: The significance of the correlations is based on the covariance metric.
Significance level: *** $p<0.001$.

solitary – it was necessary to establish that informal activity did not operationally overlap with the social relationship construct. Accordingly, an additional analysis contrasted two further models. In the first, all informal activity and social relationship indicators were loaded on a single latent variable. In the second, informal activity and social relationship measures were loaded on two separate latent variables.[5] When the respective chi-squared values and degrees of freedom were compared for the single factor model ($\chi^2=69.43$, df=12) and the dual factor model ($\chi^2=31.63$, df=11), the differences were significant, indicating that the latter model was preferable.[6] This procedure confirmed that informal activity and social relationship quality, as operationalised in the analysis, were independent phenomena.

The main aim of the research was to examine critically the assumed relationship between activity and wellbeing in old age by testing an alternative explanation, that the quality of older people's social relationships influences their wellbeing rather than their activity level *per se*. To test this proposition, a structural equation model was produced with five 'central factors', three for the activity phenomenon, one for social relationship quality, and one for wellbeing (Figure 1). The activity measurement model at this stage was that confirmed by the previous analyses. The structural model took into account the effects of the key

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Notes: All the paths shown were predicted; those represented by a dotted line were statistically insignificant. For parsimony of presentation, the income and education variables are shown on the same paths (with the education statistics in parentheses). In two cases, one of the variables on these shared lines was significant (income with well-being and with network), and the other was not (education with well-being and with network). 1. The loading of this parameter was fixed at 1 and has no critical ratio.

Figure 1. Theoretical model and final standardised estimates.

socio-demographic background variables (income and education) and health status. For parsimony, the income and education variables are shown in the figure on the same path trajectories, and the education statistics in parentheses. In practice, the analysis considered the two socio-demographic characteristics separately.

To reflect the hypothesised reciprocal effects between social relationship quality (SRQ) and informal activity, the structural model included non-recursive relations between these two particular factors. Figure 1 shows the predicted paths both from the informal activity factor to the latent SRQ and *vice versa*[7]. The path coefficients of the structural model are presented in Figure 1, and a summary of the results in Table 4. The resultant model provided an adequate fit to the data.[8] Table 4 (rows A) specifies the standardised path coefficients between the background variables and the respective activity, relationship and wellbeing factors, which show that health status significantly associated with all the main constructs except wellbeing. Income correlated with all but one of the constructs in question, informal activity. In contrast, educational level was associated with only the solitary and formal types of activity.

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TABLE 4. *Standardised path coefficients in the final model*

	Solitary activity	Formal activity	Informal activity	Social relationship quality	Wellbeing
A. Paths between background variables and key factors					
Health	0.37***	0.33**	0.57***	0.38**	0.19
Income	0.14***	0.21**	0.06	0.22***	−0.18***
Education	0.55***	0.22**	0.02	0.02	−0.06
B. Paths between key factors and the wellbeing outcome					
Wellbeing	0.03	0.03	0.15	0.74***	

Notes: The significance of the path coefficients is based on the unstandardised metric.
Significance levels: * $p<0.05$; ** $p<0.01$; *** $p<0.001$.

Table 4 (row B) presents the standardised path coefficients between both the activity domains and the social relationship quality construct on the one hand, and, on the other, the outcome variable, wellbeing. As is clear, when activity and social relationships were entered simultaneously, a strong association between social relationship quality and wellbeing was found. On the other hand, the association between each of the three aspects of activity with wellbeing was miniscule or non-existent. To substantiate these findings, two alternative structural models were examined. In the first, the activity domains were omitted, thus focusing attention on social relationship quality. The results showed that the omission of the activity measures strengthened the association between social relationship quality and wellbeing, but only slightly. In the second, the social relationship quality factor was omitted, focusing attention on the respective activity domains. The results revealed that when social relationship quality was excluded, informal activity positively associated with wellbeing, and that neither formal nor solitary activity related to wellbeing. These findings further corroborate the main findings.

Discussion

The calibrated structural model supports two of the three initial hypotheses, but not the third, that activity level is associated with wellbeing in later life. On the other hand, social relationship quality was found to be associated positively with wellbeing, and the quality of social ties had a stronger association with wellbeing than the extent of informal activities. Partly on the basis of previous empirical tests of activity theory, it had been assumed that informal activity would maintain an association with wellbeing, albeit of lesser strength. It was therefore unexpected that when

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the extent of informal activity and social relationship quality were entered simultaneously into the structural model, the effect of the latter was overwhelmingly dominant. A possible explanation is that the extent of informal activity influences wellbeing indirectly, through the intervening social relationship factor.

This finding provides support for the initial assumptions about the importance of social ties. That is, when social relationships and a quantitative measure of informal activity are examined together, no independent effect of the extent of informal activity on wellbeing was found. The findings therefore support the assertion that it is primarily the social-relational aspects of informal activity that account for its association with wellbeing in later life. This conclusion was confirmed by the findings on the inter-relationship between informal activity quantity and social relationship quality. It was hypothesised that this inter-relationship was reciprocal, reasoning that frequent informal activity would lead to improved social relationships, and *vice versa*. The predicted reciprocal paths support the proposition, but the extent of informal activity did not directly affect wellbeing. The findings therefore suggest that wellbeing in later life is less a result of what older people do, but rather of who with and how they feel about them. Interestingly, and unexpectedly, the social relationship construct emerged in this study as the prime predictor of wellbeing in old age. The latent social relationship quality variable achieved a far greater association with the wellbeing construct than any of the other factors addressed in the study.

It was joined only by the ambivalent effect of income, for while it had a positive if weak association with formal activity, solitary activity and social relationships, it was negatively related to wellbeing. At first glance, this runs counter to common knowledge and expectations. Further consideration suggests an alternative interpretation, that when the dominant effect of social relationship quality is controlled, greater income does not produce greater personal wellbeing. This perhaps implies that, although money can buy love, it cannot buy happiness in the absence of meaningful social ties.

Another finding of note is the lack of association between the level of education and several of the main study variables, including informal activity, social relationship quality and wellbeing. The explanation is most likely in social history. The current Jewish elderly cohort in Israel comprises people who experienced significant and multiple dislocations during their lifetimes, as variously through war, migrations (many impelled) and economic adversity. As a consequence, many did not complete their schooling. In the current cohort of Jewish-Israeli older people, the level of education probably has lower variance than among their peers in

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other developed countries (Brodsky, Shnoor and Be'er 2003). The low variance may account for the lack of evidence in this study of an association between education and wellbeing.

The lack of an association between health and wellbeing when social relationships were considered also requires comment. It might be that the dominance of social relationship quality as a predictor of wellbeing arose from the nature of the wellbeing construct (Kahn and Juster 2002). It was a latent variable with three elements: psychological wellbeing, life satisfaction, and satisfaction with the use of time. This construct was thought to be especially appropriate for capturing the relative effects of activity and social relationships. It could be, however, that aggregating life satisfaction, satisfaction with the use of time and psychological wellbeing into a latent construct lessened the strength of the association between health and wellbeing. Another partial explanation may be that health status also works through the social network and activity measures. That is, healthier people maintain more diverse social relationships and engage in more productive and reciprocal social ties (Litwin 1998). Indeed, the relationship between the health and social relationship measures in the current structural model was significant.

Our interpretation of the findings must be tempered by some limitations of the current data and analysis. First, the survey from which the data were drawn was not designed to test activity theory, and the activity indicators derived from the original questionnaire items were not ideal. Nevertheless, as the confirmatory factor analysis demonstrated, the activity items enabled an acceptable replication of the division of activity into the three realms that are conceived by activity theorists. Similarly, the measures of social relationships were based on limited and relatively simple indicators.

Second, as in all research of this kind, the findings are valid only in the particular social and temporal context, and third, the data were exclusively cross-sectional. Panel data would have enabled a more exact characterisation of changes in activity patterns and their effects on the respondents' personal wellbeing. This last shortcoming was partly offset by the large national sample, which allowed an exceptionally focused analysis of older people who had worked in the past but were not currently employed, the most appropriate population among which to examine activity theory and, specifically, lost roles and supports. Moreover, cross-sectional data are not without value, for as Kahn and Juster (2002: 637) maintained, 'the current state of one's relationship with spouse, children, or friends can be thought of as reflecting a past history of interaction which has produced a characteristic level of satisfaction with each of those relationships'.

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In conclusion, this study has made an original contribution to our understanding of the complex associations between activity and wellbeing in later life. The results support the proposition that 'social relationship quality', a factor that has generally been neglected in the study of informal activity, is the primary influence on the association between activity and wellbeing. It appears that the quality of social ties matters more than involvement in activities as a predictor of a good old age.

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NOTES

1 The pertinent factors and associations are indicated in Figure 1.
2 The groups excluded from the analysis were Arabs (7%), Russian Jews who immigrated after 1989 (20%), and native-born Israeli Jews (11%).
3 We followed the guidelines provided by Raykov, Tomer and Nesselroad (1991) on the appropriate statistics for evaluating the fit of the model. These included the chi-squared statistic (related to degrees of freedom and level of significance). Better-fitting models have lower chi-squared values given the number of degrees of freedom. We also examined the following descriptive indices of fit: Bentley-Bonett's normed fit index (NFI), and the comparative fit index (CFI). Another fit index employed is the root-mean-squared errors of approximation (RMSEA), one of the most informative criteria in covariance structure modeling (Byrne 2001). Although the decision criteria vary for these fit indices, for a model to be regarded as a 'good fit', analysts generally expect the NFI and CFI values to be greater than 0.90 (Thompson 2000) and the RMSEA to be below 0.08 (Musil, Jones and Warner 1998).
4 In SEM, comparison between models is judged by the $\Delta\chi^2$ statistic, essentially the difference in the χ^2 values between two models in relation to the difference in their numbers of degrees of freedom (Hoyle 1995).
5 Two correlations between the error terms for the indicators that asked for information regarding the same individuals (neighbours and friends) were 'allowed' and should not greatly disturb the results.
6 The comparison was effected with the chi-squared statistic (see note 4).
7 In estimating this model, we allowed for three correlations among error terms, the two that were previously admitted, and one between two wellbeing indicators (the wording was similar): 'satisfaction with the use of time' and 'life satisfaction'.
8 The test statistics were $\chi^2 = 930.2$ ($N = 1334$, df 206, $p < 0.001$), NFI = 0.98, CFI = 0.99, RMSEA = 0.051 (90% confidence interval 0.048–0.055).

References

Antonucci, T. C. and Akiyama, H. 1987. Social networks in adult life and a preliminary examination of the convoy model. *Journal of Gerontology*, **42**, 519–27.

https://doi.org/10.1017/S0144686X05004538 Published online by Cambridge University Press

Arbuckle, J. L. and Wothke, W. 1999. *Amos 4.0 User's Guide*. Small Waters Corporation, Chicago.

Bergstrom, M. J. and Holmes, M. E. 2000. Lay theories of successful aging after the death of a spouse: a network text analysis of bereavement advice. *Health Communication*, **12**, 377–406.

Blieszner, R., Usita, P. M. and Mancini, J. A. 1996. Diversity and dynamics in late-life mother-daughter relationships. *Journal of Women and Aging*, **8**, 5–24.

Bowling, A. 1990. Associations with life satisfaction among very elderly people living in a deprived part of inner London. *Social Science and Medicine*, **31**, 1003–11.

Brodsky, J., Shnoor, Y. and Be'er, S. (eds) 2003. *The Elderly in Israel: Statistical Abstract 2002*. JDC-Brookdale Institute of Gerontology and Adult Human Development, Jerusalem, Israel (In Hebrew).

Byrne, B. M. 2001. *Structural Equation Modeling with Amos: Basic Concepts, Applications and Programming*. Lawrence Erlbaum, Mahwah, New Jersey.

Chappell, N. L. and Marshall, V. W. 1992. Social integration and caregiving among seniors in Bermuda. *Ageing & Society*, **12**, 499–514.

Chen, C. N. 2001. Aging and life satisfaction. *Social Indicators Research*, **54**, 57–79.

Cohen, S. and Syme, S. L. (eds) 1985. *Social Support and Health*. Academic, New York.

Cornoni-Huntley, J. C., Roley, D. F., White, L. R., Suzman, R., Berkman, L. F., Evans, D. A. and Wallace, R. B. 1985. Epidemiology of disability in the oldest old: methodological issues and preliminary findings. *Milbank Memorial Fund Quarterly: Health and Society*, **63**, 350–76.

Coward, R. T. 1987. Factors associated with the configuration of the helping networks of noninstitutionalized elders. *Journal of Gerontological Social Work*, **10**, 113–32.

Ell, K. 1984. Social networks, social support and health status. *Social Service Review*, **58**, 133–49.

Fung, H. H., Carstensen, L. L. and Lang, F. R. 2001. Age-related patterns in social networks among European Americans and African Americans: implications for socio-emotional selectivity across the life span. *International Journal of Aging and Human Development*, **52**, 185–206.

Havighurst, R. J. and Albrecht, R. 1953. *Older People*. Longman, Green and Company, New York.

Havighurst, R. J., Neugarten, B. L. and Tobin, S. S. 1964. Disengagement and patterns of aging. *The Gerontologist*, **4**, 24.

Heller, K. and Mansbach, W. E. 1984. The multifaceted nature of social support in a community sample of elderly women. *Journal of Social Issues*, **40**, 99–112.

House, J. and Kahn, R. 1985. Measures and concepts of social support. In Cohen, S. and Syme, S. L. (eds), *Social Support and Health*. Academic, New York, 83–108.

Hout, D. R., Kaiser, M. A., Peters, G. R. and Babchuk, N. 1980. Life satisfaction and activity theory: a multidimensional approach. *Journal of Gerontology*, **35**, 935–41.

Hoyle, R. H. 1995. The structural equation modeling approach: basic concepts and fundamental issues. In Hoyle, R. H. (ed.), *Structural Equation Modeling: Concepts, Issues and Applications*. Sage, London, 1–15.

Kahn, R. L. and Juster, F. T. 2002. Well-being: concepts and measures. *Journal of Social Issues*, **58**, 627–44.

Kennedy, C. A., King, J. A. and Muraco, W. A. 1983. The relative strength of health as a predictor of life satisfaction. *International Social Science Review*, **58**, 97–102.

Keyes, C. L. M. 2002. The exchange of emotional support with age and its relationship with emotional well-being by age. *Journals of Gerontology: Psychological Sciences*, **57**, P518–25.

Knapp, M. R. J. 1977. Activity theory of aging: an examination in an English context. *The Gerontologist*, **17**, 553–9.

https://doi.org/10.1017/S0144686X05004538 Published online by Cambridge University Press

Krause, N., Herzog, A. R. and Baker, E. 1992. Providing support to others and well-being in later life. *Journals of Gerontology*, **47**, P300–11.
Kutner, B., Fanshel, D., Togo, A. M. and Langner, T. S. 1956. *Five Hundred over Sixty: A Community Survey on Aging*. Russell Sage Foundation, New York.
Lemon, B. W., Bengtson, V. L. and Peterson, J. A. 1972. Exploration of the activity theory of aging: activity types and life satisfaction among in-movers to a retirement community. *Journal of Gerontology*, **27**, 511–23.
Leonard, W. M. 1981–82. Successful aging: an elaboration of social and psychological factors. *International Journal of Aging and Human Development*, **14**, 223–32.
Levitt, M. J., Antonucci, T. C., Clark, M. C., Rotton, J. and Finley, G. E. 1985–86. Social support and well being: preliminary indicators based on two samples of the elderly. *International Journal of Aging and Human Development*, **21**, 61–77.
Litwin, H. 1996. *The Social Networks of Older People: A Cross-National Analysis*. Praeger, Westport, Connecticut.
Litwin, H. 1998. Social network type and health status in a national sample of elderly Israelis. *Social Science and Medicine*, **46**, 599–609.
Litwin, H. 2004. Intergenerational exchange patterns and their correlates in an aging Israeli cohort. *Research on Aging*, **26**, 202–23.
Litwin, H. 2005. Correlates of successful aging: are they universal? *International Journal of Aging and Human Development*, **61**, 313–33.
Longino, C. F. and Kart, C. S. 1982. Explicating activity theory: a formal replication. *Journal of Gerontology*, **37**, 713–22.
Maddox, G. L. 1963. Activity and morale: a longitudinal-study of selected elderly subjects. *Social Forces*, **42**, 195–204.
Marshall, V. W. 1994. Sociology, psychology, and the theoretical legacy of the Kansas City studies. *The Gerontologist*, **34**, 768–74.
McGhee, J. L. 1985. The effects of siblings on the life satisfaction of the rural elderly. *Journal of Marriage and the Family*, **47**, 85–91.
McKenzie, B. and Campbell, J. 1987. Race, socioeconomic status, and the subjective well-being of older Americans. *International Journal of Aging and Human Development*, **25**, 43–61.
Mitchell, J. C. 1969. The concept and use of social networks. In Mitchell, J. C. (ed.), *Social Networks in Urban Situations*. University of Manchester Press, Manchester, 1–50.
Morris, D. C. 1991. Church attendance, religious activities, and the life satisfaction of older adults in Middletown, USA. *Journal of Religious Gerontology*, **8**, 83–96.
Musil, C. M., Jones, S. L. and Warner, C. D. 1998. Structural equation modeling and its relationship to multiple regression and factor analysis. *Research in Nursing and Health*, **21**, 271–81.
Pinquart, M. and Sorensen, S. 2000. Influences of socioeconomic status, social network, and competence on subjective well-being in later life: a meta-analysis. *Psychology and Aging*, **15**, 187–224.
Pot, A. M., Deeg, D. J. H. and Van Dyck, R. 1997. Psychological well-being of informal caregivers of elderly people with dementia: changes over time. *Aging and Mental Health*, **1**, 261–8.
Raykov, T., Tomer, A. and Nesselroade, J. R. 1991. Reporting structural equation modeling results in psychology and aging: some proposed guidelines. *Psychology and Aging*, **6**, 499–503.
Regev, I. 1998. The influence of the quality of relations in the social networks of the elderly on their life satisfaction. *Gerontologia*, **25**, 3–4, 69–86 (in Hebrew).
Reich, J. W., Zautra, A. J. and Hill, J. 1987. Activity, event transactions, and quality-of-life in older adults. *Psychology and Aging*, **2**, 116–24.
Reitzes, D. C., Mutran, E. J. and Verrill, L. A. 1995. Activities and self-esteem: continuing the development of activity theory. *Research on Aging*, **17**, 260–77.

https://doi.org/10.1017/S0144686X05004538 Published online by Cambridge University Press

Rowe, J. W. and Kahn, R. L. 1997. Successful aging. *The Gerontologist*, **37**, 433–40.
Smith, A. E., Sim, J., Scharf, T. and Phillipson, C. 2004. Determinants of quality of life amongst older people in deprived neighbourhoods. *Ageing & Society*, **24**, 793–814.
Thompson, B. 2000. Ten commandments of structural equation modeling. In Grimm, L. G. and Yarnold, P. R. (eds.), *Reading and Understanding More Multivariate Statistics*. American Psychological Association, Washington DC, 261–82.
Vinoker, A. D. and Schul, Y. 2002. The web of coping resources and pathways to re-employment following a job loss. *Journal of Occupational Health Psychology*, **7**, 68–83.
Zaranek, R. R. and Chapleski, E. E. 2005. Casino gambling among urban elders: just another social activity? *Journals of Gerontology: Social Sciences*, **60**, S74–81.

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