Relationships between Health Promoting Activities, Life Satisfaction, and Depressive Symptoms in Unemployed Individuals

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Abstract

This cross-sectional study examined whether engagement in health promoting activities, alone or with other family members, were associated with enhanced levels of life satisfaction and reduced levels of depressive symptoms in unemployed individuals. Unemployed individuals (*N* = 195) recruited from an Australian online platform completed self-report measures of life satisfaction, depressive symptoms, consumption of healthy meals and engagement in physical activities in social (e.g., exercising or eating healthy meals with other family members) and solitary (e.g., exercising or eating health meals alone) conditions, and demographic and socio-structural variables. Hierarchical linear multiple regression analyses controlling for demographics and socio-structural variables revealed statistically significant positive relations between social forms of healthy eating and solitary forms of physical activity and life satisfaction. Social forms of healthy eating was also negatively related to depressive symptoms. Findings highlight the relevance of the conditions in which health promoting activities are performed in relations with indices of well-being. Researchers and policymakers are advised to take whether health promoting activities are performed social and solitary conditions when examining correlates of life satisfaction and depressive symptoms.

Keywords. psychological well-being; physical activity; healthy eating; unemployment

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Unemployment is a stressful life event that has deleterious effects on physical and mental health of individuals and their families. A meta-analysis of studies examining relationships between job loss and indicators of physical health or psychological well-being, reported a moderate relationship between unemployment and life satisfaction (d = -.48), indicating that approximately 16.6% more individuals would experience diminished levels of life satisfaction compared to individuals who did not experience a spell of unemployment (McKee-Ryan et al., 2005). Moreover, parental job loss scars the next generation (Kalil & Ziol-Guest, 2008; Kertesi & Kezdi, 2008; Oreopoulos et al., 2008; Rege et al., 2007). For instance, Gregg, Macmillan, and Nasim (2012) estimated that children with displaced fathers achieved up to one-half of a UK General Certificate of Education (GCSE) relative to children whose fathers were not displaced during the 1980s economic recession, which equated to these children earning 2% lower wages as adults.

Although involuntary job loss reduces levels of subjective and family well-being, a large body of research has identified a number of psychological and financial factors that mitigate the negative relationship between unemployment and well-being outcomes (Catalano et al., 2011). Broadly speaking, evidence stemming from this literature suggests that unemployed individuals are likely to report relatively high levels of psychological well-being when they are optimistic, live in environments where unemployment is not the norm (Aghion et al., 2016; Kalil, 2009; Lai & Wong, 1998), or receive financial assistance in the form of unemployment insurance programs (Gruber, 1997; Sjöberg, 2010) or educational programs that facilitate job search skills. Most relevant, a number of studies has documented that, due to increases in non-labour leisure time, unemployment may facilitate greater investments in health-promoting activities such as healthy eating and exercise participation (Cawley & Liu, 2012; Cylus & Avendano, 2017). As a

consequence of these new health investments, unemployed individuals may cope better with financial stress and corresponding inability to make ends meet. This is because health promoting activities have antidepressant and anxiolytic effects (Kritz-Silverstein et al., 2001; Singh et al., 2001; van Minnen et al., 2010). However, contrary to evidence supporting links between engagement in health promoting activities and mental health among employed individuals (Lai et al., 2013; Schuch et al., 2018), research has observed small or statistically non-significant relationships between investments in health promoting activities such as physical activity and mental health outcomes among the unemployed (Goodman et al., 2017).

In this study, we examine relationships between health promoting behaviors and well-being indicators of unemployed individuals. Specifically, based on research stemming from Jahoda's (1982) latent deprivation model, we distinguish between two types of health promoting activities: engagement in social health promoting activities that are performed with others and those performed alone. Examples of *social* health promoting activities performed with others include consumption of healthy meals or engaging in physical activities with family members. Examples of *solitary* health promoting activities include consumption of healthy meals alone or engaging in physical activities alone. Building on the latent deprivation model, we predict that engagement in social or solitary health promoting activities would we related to well-being outcomes, namely, better life satisfaction and fewer depressive symptoms. The present study adds to the literature by testing unique relations of social and solitary health promoting activities separately with psychological well-being outcomes among unemployed individuals.

Conceptual Framework

According to Jahoda's (1982) latent deprivation model, involuntary job loss undermines mental health and psychological well-being because it deprives individuals from two work-related functions that facilitate enhanced levels of mental health and psychological well-being during periods of employment. The first function (manifest function) involves financial factors

such as loss of income. Loss of financial income undermines mental health and psychological well-being by increasing stress that stems from inability to purchase and consume goods or services that lead to enhanced levels of psychological well-being. The second function (latent function) involves deprivation of deep-seated psychological needs. These psychological needs are concerned with time structure (i.e., effective use of available time), social contact (i.e., time spend with others), collective purpose (i.e., contributions to community), social identity/status (i.e., feelings related to being valued by others), and activity (i.e., keep oneself busy, pursuing or achieving daily goals; Muller et al., 2005; Paul & Moser, 2009).

One research question that can be derived from the latent deprivation model is concerned with whether investments in recreational activities mitigate the negative association between involuntary job loss and mental health and psychological well-being. In principle, engagement in recreational activities should predict enhanced levels of psychological well-being if they satisfy some (or all) of the needs that are deprived as a result of involuntary job loss (Jahoda, 1981). In accordance with this proposition, a number of studies have hypothesized and demonstrated that unemployed individuals who engage in social or solitary recreational activities experience higher levels of mental health and psychological well-being than unemployed individuals who do not engage in such activities (Goodman et al., 2017; Hong et al., 2009; Lemon et al., 1972; Pfeiffer et al., 2011; Takeda et al., 2015). These activities may enhance well-being by providing meaningful ‘replenishment’ of unemployed individuals diminished levels of need satisfaction experienced as a result of involuntary job loss (Waters & Moore, 2002). For example, Evans and Haworth (1991) demonstrated that solitary activities such as going to the theatre alone, were associated with enhanced levels of psychological well-being because they satisfied, in Jahoda’s (1981) latent deprivation model, the activity function of keeping oneself busy. Likewise, engagement in social recreational activities mitigated the

negative association between unemployment and psychological well-being by increasing social contact (Reitzes et al., 1995; Winefield et al., 1992).

Although previous studies examined associations between social and solitary recreational activities and psychological well-being there is a relative dearth of research examining analogous associations between health promoting activities and psychological well-being among unemployed individuals. The reason for this is that previous studies measuring engagement in health-related behaviors through global measures did not make an explicit distinction between the social and solitary aspects of the behaviors. As a consequence, little is known on whether the relationships observed between health promoting behaviors and well-being outcomes can be attributed to whether the health promoting activities were performed alone or with others. This gap in knowledge is important because associations between social and solitary health promoting activities and well-being outcomes provide information on the specific conditions in which health promoting behaviors are performed that may yield optimal levels of psychological well-being among unemployed individuals.

For example, observing relations between well-being and health promoting activities, regardless of whether they are performed alone or with others, suggests that well-may can be optimized by instructing unemployed individuals to invest their leisure time regardless the conditions. However, if well-being is found to be associated with health promoting activities performed under specific conditions, such as when alone or socially, it may have ramifications for future research and practice on health promotion among the unemployed. Such evidence may suggest that optimal well-being among unemployed people is not only a function of the health promoting activity itself, but also the conditions under which it is performed. Based on these propositions, the present study aims to provide preliminary evidence on the links between health promoting behaviors, conditions under which they are performed, social or solitary, and psychological well-being in a sample of unemployed individuals.

Overview of the Study and Hypothesis

The purpose of the present study was to examine the unique relations between social and solitary health promoting activities and indices of psychological well-being among unemployed individuals. We measured two health-promoting activities, namely consumption of healthy foods and engagement in physical activities, performed under two conditions, alone (solitary) or with family members (social). We measured two key well-being outcomes: depressive symptoms and life satisfaction. We did not develop any specific hypothesis regarding associations between social and solitary health promoting activities and outcomes because studies stemming from Jahoda's (1981) latent deprivation model do not predict which types of health-promoting activities or latent functions are more important in predicting well-being outcomes. In addition, studies that targeted the general population have revealed inconsistent findings with respect to associations between solitary or social health promoting activities and psychological well-being. While some studies have shown that social forms of healthy eating yield higher levels of psychological well-being than solitary forms of healthy eating, corresponding associations for physical activities depended on a number of factors such as age, gender, or individuals' preferences for social versus solitary forms of physical activity (Beauchamp, 2007; Desbiens et al., 2017; Martin et al., 2007; Plante et al., 2001).

In the current study, we also identified participants who lived in a family, and measured additional demographic and socio-structural variables that serves as covariates when estimating relations between health promoting behaviors and depressive symptoms and life satisfaction. In the present study, participants were considered to have a family if they were married or lived with a partner in the same house (Qu & Weston, 2013). Divorced participants with children were included in the study as these participants were considered to have family obligations. In addition, we also measured partner unemployment status and income. The reason behind measuring these variables is that there is evidence that long-term unemployed parents whose

partner works are more likely to invest in health promoting behaviors than unemployed parents whose partner is also unemployed and are likely to have more resources available (Becker, 1965; Cawley, 2007; Chetty, 2008; Cylus et al., 2015; Grossman, 1972; Jahoda, 1982). We also included gender, age, and unemployment duration as covariates in our models as these variables may affect well-being and health behavior selection in unemployed people.

Method

Participants and Design

Participants were 195 unemployed individuals who were recruited through an online data collection platform in Australia (males, *n* = 89, females, *n* = 106; *M* age= 33.73, *SD* = 10.99). Participants were included in the study if they were older than 18 years, if they reported to be unemployed but needed to generate income, if they were married (*n* = 144) or lived with a partner in the same house (*n* = 39). Divorced and separated participants with children were included in the study as these participants need to generate income (n = 12; Goodman et al., 2017; Qu & Weston, 2013). Participants were not included in the study if they were retired (n = 15), employed on a part-time basis (*n* = 25) or if they did not have partner (n = 13; Goodman et al., 2017; Qu & Weston, 2013). Participants providing incomplete data were also eliminated (*n* = 8). We adopted a cross-sectional design with all variables being measured at the same point in time. All participants reported their responses through an on-line survey. Participants were compensated with $5 upon completion of the survey.

Measures

Depressive symptoms. Depressive symptoms were measured through the Centre for Epidemiologic Studies Depression scale (CESD; Björgvinsson et al., 2013; Radloff, 1977). This is a 10-item measure that prompts participants to report the frequency of occurrence of depressive symptoms the previous week. An example item was: “I had trouble keeping my mind on what I was doing”. All items were measured on 4-point frequency scales ranging from (0)

"rarely or none of the time; less than 1 day" to (3) "all of the time; 5-7 days". The alpha reliability of this scale was satisfactory ($\alpha = .74$).

Life satisfaction. Life satisfaction was measured through Diener and colleagues' (1985) scale that prompted participants to report their agreement with five statements that aimed to capture general levels life satisfaction. An example item was: "The conditions of my life are excellent". All items were measured on 7-point Likert scales ranging from (1) "strongly disagree" to (7) "strongly agree". The alpha reliability of this scale was satisfactory ($\alpha = .94$).

Engagement in social and solitary forms of physical activity. We used the International Physical Activity Questionnaire (IPAQ) to measure whether participants engaged in physical activities with others or alone (Craig et al., 2003). In particular, participants were initially presented with definitions of vigorous (defined as activities that take hard physical effort and make breathe much harder than normal), moderate (activities that take moderate physical effort), and light forms of physical activity (i.e., walking). Participants were then asked to report the duration and frequency with which they engaged in vigorous, moderate, and light forms of physical activity the previous 7 days. Frequency and duration of physical activity participation were measured on open-ended scales prompting participants to report frequency of physical activity participation, in days per week, and duration of each physical activity session in hours and minutes.

Engagement in physical activities with family members was measured through a modified version of the IPAQ. Specifically, participants were initially presented with the same definitions of vigorous, moderate, and light forms of physical activity as in the original IPAQ. However, after reading the definitions of physical activity, participants were requested to report the duration and frequency with which they engaged in vigorous, moderate, and light forms of physical activity the previous 7 days with their partner or children. As in the original IPAQ, frequency and duration of physical activity participation were measured on open-ended scales

prompting participants to report frequency of physical activity participation, in days per week, and duration of each physical activity session in hours and minutes (Craig et al., 2003).

We produced indexes of social and solitary physical activity variables based on metabolic equivalent (MET) scores from the IPAQ. MET values were estimated by multiplying time-spent (in minutes) in vigorous, moderate and light forms of physical activity by 8, 4, and 3.3 respectively, consistent with IPAQ scoring guidelines (Ainsworth et al., 2020).

Social and solitary forms of healthy eating. Following Cawley and Liu's (2012) methods, consumption of healthy meals alone or with family members were measured through one question each that prompted participants to report how often (in days per week) they prepared and consumed healthy meals for breakfast, lunch, or dinner with their family members or alone the last week. Although our measure of eating healthy meals socially made reference to both meal preparation and eating together, our main focus was predominantly on whether meal was consumed together in a social environment, and we assumed that those preparing the meal together would also eat it together. Prior to responding to those two questions, participants were informed that a healthy meal was a meal that was prepared with fresh ingredients. Participants were also informed that the category of healthy meals did not include pre-prepared meals or takeaways that participants might have been purchasing from supermarkets. Participants responded to questions aiming to capture healthy eating on open-ended scales that captured frequency of healthy eating in days per week.

Demographic variables. Age was measured through an open-ended question asking participants to report their age in years. Gender was represented by a dummy-coded variable coded one for males (1) and two for females (2). Partner employment status was measured using a closed question asking participants to report whether their partner was unemployed, employed on a part time basis, employed on a full time basis or homemaker. Partner employment status was represented by a dummy-coded variable coded one (1) for participants whose partners were full or part-time employed and zero (0) for participants whose partners were unemployed.

Participants' partner's salary was measured using an open ended question asking for annual pre-tax salary of their partner in Australian dollars. Unemployment duration was measured through an open ended question asking participant to report length of unemployment in months. Unemployment duration ranged from 1 month to 120 months. Number of dependent children was measured through an open-ended question asking participants to report number of children for whom participants were responsible for the day-to-day care, welfare and their development. The age of dependent children ranged from 3 months to 23 years. Marital status was measured using a closed question asking participants to report whether they were currently single, married, living full-time with a partner, divorced, or widowed. Marital status was represented by a dummy-coded variable coded as one (1) single or not in a partnership and (2) married or living full-time with partner.

Data Analysis

We conducted a series of preliminary analyses in which we estimated the descriptive statistics (mean, standard deviation, skewness, kurtosis) of the study variables, and the zero-order correlations among them. For the main analysis, we conducted two hierarchical linear multiple regression analyses using an ordinary least squares method and a bootstrap simulation procedure with 10000 replications to produce robust standard errors. Life satisfaction and depressive symptoms, respectively, were the dependent variables for each analysis. In both analyses, age, gender, partner employment status, unemployment duration, partner salary, marital status, and number of children were entered as predictors of the dependent variable in the first step. In the second step, we entered constructs capturing the social and solitary forms of participation in physical activity and healthy eating. We entered the social and solitary health promoting activities as separate predictors in order to examine the unique association between the social and solitary types and health-promoting activity separately. Relations between social and solitary health promoting activities and life satisfaction or depressive symptoms were considered supported if the associations were statistically significant. In addition, we also

examined the association between participation in each activity and levels of life satisfaction and depression separately by solving the regression equation for mean values of each variable in the analysis, and then examining the effect of a one standard deviation increase in each of the social or solitary health promoting activity on the dependent variable (Aiken & West, 1991).[1] The data file, analysis scripts, and analysis outputs are available online: https://osf.io/nq4gz/.

Results

Preliminary Analyses

Descriptive statistics for the study variables are presented in Table 1. Approximately 49.23% of participants lived with an employed partner. Mean scores on the social or solitary health promoting activity variables indicated that participants preferred to engage in solitary rather than social forms of physical activity and healthy eating. Some of the variables exhibited positively skewed and leptokurtic distributions. The most extreme were the social and solitary physical activity participation variables and the partner salary variable. We therefore used square root transformations of these variables in subsequent analyses.

Zero-order correlation coefficients among study variables are presented in Table 2. We observed a significant positive correlation between social forms of healthy eating and life satisfaction, and a significant negative correlation between social forms of healthy eating and depressive symptoms. Unemployed participants were more likely to report relatively higher levels of life satisfaction and lower depressive symptoms when they consumed healthy meals with other family members. We also observed significant, positive correlations between social and solitary forms of physical activity and life satisfaction, and significant, negative correlations between social and solitary forms of physical activity and depressive symptoms. Participants were more likely to report higher levels of life satisfaction and lower levels of depressive symptoms if they performed physical activity, regardless of whether it alone or with their family

[1]Sensitivity analysis using the Webpower function in R (Zhang & Yuan, 2018) with alpha set at .05 (two-tailed) indicated that our sample size (N =195) gave us 90% power to detect a medium effect size (ρ = .23). The analysis can be replicated using these inputs here: https://webpower.psychstat.org/models/cor01/.

members. Correlations between solitary forms of healthy eating and life satisfaction and depressive symptoms were smaller and not statistically significant.

Main Analysis

Results of the hierarchical linear multiple regression analyses predicting life satisfaction and depressive symptoms are presented in Table 3. In the first step of the analyses, number of children was significantly and positively related to life satisfaction and negatively related to depressive symptoms. Marital status was also significantly and negatively related to depressive symptoms, such that being married or living with a partner was associated with lower depressive symptoms. In the second step of the analysis, we found statistically significant, positive associations between social forms of healthy eating and solitary forms of physical activity and life satisfaction. We also found statistically significant, negative associations between solitary forms of physical activity and depressive symptoms. We found no significant associations between solitary forms of healthy eating, or social forms of physical activity, and either outcome. Furthermore, although social forms of healthy eating was negatively related to depressive symptoms, the effect size was small and not statistically significant[2].

Figures 1 and 2 present expected levels of life satisfaction and depressive symptoms of participants who engaged in social or solitary forms of health promoting activities. Results indicate that participation in some forms of health promoting activity led to the highest levels on both outcomes. Participants who engaged in solitary forms of physical activity reported the highest levels of life satisfaction (M = 4.15; a near-tie with participants who consumed health meals in social contexts, see Figure 1) and the lowest levels of depressive symptoms (M = 7.11, see Figure 2). However, in other cases, participating in both forms of health promoting activity did not lead to the highest levels on the outcomes. For example, while unemployed individuals

[2]For completion, we also conducted an alternative set of hierarchical linear multiple regression analyses in which we used effects-coded physical activity variables corresponding to high, medium, and low levels of physical activity derived from the IPAQ in place of the square-root transformed versions. While the size of the coefficients differed slightly, the pattern of effects was identical to the analyses using the transformed social and solitary physical activity variables. Details and results of the analyses are presented in Appendix A (supplemental materials).

who consumed healthy meals with other family members reported the highest levels of life satisfaction (M = 4.14; a near-tie with solitary forms of physical activity, see Figure 1), the level of depressive symptoms reported by unemployed individuals who shared healthy meals with other family members was relatively high (M = 7.72, see Figure 2). Nevertheless, the overall pattern of findings suggests that unemployed individuals are likely to experience higher levels of life satisfaction and fewer depressive symptoms if they engage in physical activities alone, and higher levels of life satisfaction if they eat healthy meals with their family.

Discussion

The purpose of the current study was to examine associations between social and solitary forms of health promoting activities and well-being outcomes among unemployed individuals. In accordance with previous research that examined relations between health promoting activities and psychological well-being (Goodman et al., 2016; Goodman et al., 2017), current findings revealed significant relations between measures that captured engagement in physical activities and consumption of healthy meals and indices of psychological well-being. The current research extends this knowledge by demonstrating the relevance of the conditions in which the health promoting activities were performed, social and solitary, on well-being outcomes in unemployed individuals. Broadly speaking, results suggest that participants reporting engaging in physical activities alone also reported higher levels of life satisfaction and fewer depressive symptoms. In addition, those reporting consuming healthy meals with other family members also reported higher levels of life satisfaction. These findings have important theoretical implications and implication for practice.

At a theoretical level, our findings highlight the importance of distinguishing between social and solitary forms of health eating in the prediction of life satisfaction and depressive symptoms. Although both forms of health eating were correlated with life satisfaction, when examined in the context of the multiple regression analysis, it is clear that healthy eating with others had a unique, statistically significant relationship with life satisfaction, while the

relationship between eating healthy meals alone and life satisfaction was not significant. This is an important finding because had we only measured eating healthy meals in general, we would not have observed the importance of accounting conditions in which the behavior is performed in the prediction of life satisfaction. Similarly, findings illustrate the importance of accounting for the conditions in which physical activity are performed when examining relations between this health promoting behavior and well-being. Use of a generalized measure of physical activity would not have revealed the importance of the solitary over social conditions when it comes to correlates with behavior. Given these findings, we advise researchers to always consider adopting measures of health promoting behaviors that capture social and solitary forms when examining correlates of well-being in unemployed people. By measuring engagement in social and solitary health promoting activities, researchers can obtain more accurate estimates of relations between health promoting activities and well-being outcomes as well as acquire a better understanding of the relative importance of social and solitary forms of health promoting activities in explaining variance in psychological well-being among unemployed individuals.

At an applied level, the present findings may provide preliminary evidence that researchers and practitioners should take the type of health promoting behavior, social or solitary, into consideration when developing means to promote better well-being. With respect to physical activity, it seems that encouraging solitary participation in physical activity is associated with the highest levels of life satisfaction and lower levels of depressive symptoms. To speculate, this may be consistent with the notion that performing physical activity alone assists with stress management by enabling individuals to detach themselves from daily stressors, including the influence of others. However, such an explanation cannot be confirmed in the current analysis and would need to be verified empirically. With respect to relations between healthy eating and well-being, pattern is less clear. For example, consumption of healthy meals with other family members was linked to higher levels of life satisfaction, but did not exhibit a substantive relationship with reduced depressive symptoms. To speculate, it might

be that eating health meals together in a social context provides social support and a sense of belonging, but may also contribute or reinforce potential stressors. This speculative explanation cannot be supported by the current data, and would also need to be explored in future research. Given these findings, we recommend researchers and policy makers take the type of health promoting behavior, whether alone or with others, into account when examining the correlates of well-being.

Limitations and Recommendations for Future Research

Finally, it would be remiss to not discuss limitations of the present study and provide some suggestion for future research arising from the current study. Specifically, the cross-sectional, correlational design of the current study means that findings should not be used to draw inferences on causal relationships. Any predictive relations are, therefore, inferred from theory alone, not the data. Future research should consider adopting alternative designs which may allow for inference of directional relations, such as cross-lagged panel designs. It may also permit examination of how previous experience with the behavior may affect relations with well-being going forms, often considered a hallmark of the sufficiency of a model (Chatzisarantis et al., 2004; Chatzisarantis et al., 2009). Furthermore, the cross-sectional design did not permit testing other alternative or competing hypotheses. For example, a large body of research outlines how happiness and well-being impact health through multiple mechanisms. For example, happiness and well-being promote health through psychophysiological processes that promote immune, endocrine, and cardiovascular function. They are also linked to health due to their association with the uptake and maintenance of health promoting behaviors (Diener et al., 2017). So, the associations in the current study may be indicative of an alternative pathway by which life satisfaction and depressive symptoms impact health behavior participation. Alternatively, the observed associations may be part of a more complex reciprocal effects system. Future research adopting cross-lagged panel designs, time series data, or experimental designs, in which key variables (e.g., promoting health eating alone or with others) are

manipulated and their subsequent effects on outcomes (e.g., well-being) measured, may shed further light on causal mechanisms or reciprocal effects.

In addition, in the present study we assumed that social and solitary health promoting activities increase well-being outcomes among unemployed individuals because they satisfy, in Jahoda's (1981) latent deprivation model, needs for social contact or the latent function of "keeping oneself busy". However, we did not measure Jahoda's latent functions in the current study. As a consequence, the present study does not explain why and how health promoting activities enhance well-being outcomes among the unemployed. Hence, future studies should examine the processes through which social and solitary health promoting activities predicted well-being outcomes by way of measuring latent functions proposed by Jahoda (1981).

Additionally, the present study does not explain why solitary and social health promoting activities predicted different well-being outcomes. One reason for this may be due individual preferences. A number of studies that targeted the general population have shown that social forms of physical activity are more likely to be preferred by women, younger individuals, or individuals who exercise with others of a similar age (Beauchamp, 2007; Desbiens et al., 2017; Martin et al., 2007; Plante et al., 2001). Therefore, it may be important to examine in the future whether associations between social and solitary forms of physical activity and well-being outcomes vary according to age, gender or individuals' preferences for one form of activity over another.

A further issue is the lack of distinction between healthy meals eaten socially and social eating itself. While current data shown associations between well-being outcomes and eating healthy meals together, we were not able to isolate associations between social eating and these outcomes, regardless of the 'healthiness' or otherwise of the meal itself. Future research should, therefore, seek to establish whether it is the social aspect of eating the meal itself, independent of the 'healthiness' of the meal, predicts life satisfaction and well-being. This would also be consistent with Jahoda's (1981) model, fulfilling the need for social contact in the unemployed

irrespective of the health-promoting properties of the meal. Such a distinction may have important ramifications for researchers considering taking social and solitary aspects of into account when examining the correlates of well-being.

A further limitation is that we did not include a measure of participant ethnicity. While the predominant ethnicity in the Australian context is white or European, a significant proportion of the population belong to minority groups identifying with black African, South and East Asian, and Aboriginal and Torres Strait Islander ethnicities. As a consequence, we were unable to evaluate whether ethnicity moderated relations among health promoting behaviors and outcomes in the current study. This is consistent with previous research demonstrating differential adoption of health behaviors and their determinants in groups from ethnic backgrounds that have been traditionally underserved and exhibit significant disparities in health (Hagger & Hamilton, 2020; McKinley et al., 2020). Evaluating the potential moderating effects of ethnicity on associations between of health-promoting activities and health-related outcomes should be considered a priority for future research.

It is also important to note that the current sample was relatively small in size. While our sensitivity analysis indicated we had sufficient statistical power to detect study medium-sized effects, consistent with our a priori expectations and relations between physical activity and well-being and depressive outcomes more broadly, we did not have sufficient power to detect very small relationships. So, our findings should be interpreted in light of this limitation. As with many studies, replication of findings is necessary to verify patterns of associations in this kind of research, particularly in larger more representative samples, and would contribute to converging evidence for the proposed relations between solitary and group health behaviors and outcomes in this population.

Conclusion

The present study extends previous unemployment research identifying relations between recreational activities and well-being outcomes by showing for the first time that social

and solitary forms of health promoting activities are associated with depressive symptoms and life satisfaction among the unemployed. Current findings suggest that unemployed individuals that report participating in social forms of physical activity also report higher levels of life satisfaction and lower depressive symptoms. Similarly, participants reporting eating healthy meals with other family members also report higher life satisfaction. These findings highlight the importance of taking the conditions in which health promoting behaviors are performed into account when examining the correlates of well-being in the unemployed. More research is needed to ascertain whether these links are causal, as implied by Jahoda's (1982) model, and the specific mechanisms by which links between these forms of health promoting behaviors relate to well-being outcomes.

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Table 1

Descriptive Statistics for Study Variables

Variable	*M*	*SD*	Freq.	Skewness		Kurtosis	
				Statistic	SE	Statistic	SE
Life satisfaction	3.641	1.662	–	0.090	0.177	-0.940	0.353
Dep. symptoms	8.293	4.446	–	0.477	0.177	0.446	0.353
HE-Social	5.574	2.754	–	0.556	0.177	6.761	0.353
HE-Solitary	3.649	3.338	–	0.181	0.179	-1.003	0.355
PA-Social (MET)[a]	1585.494	5132.497	–	6.044	0.180	44.803	0.358
PA-Solitary (MET)[a]	2593.052	3074.728	–	2.186	0.179	5.534	0.356
Age	33.728	10.986	–	0.492	0.174	-0.706	0.346
Gender	–	–	53.846	–	–	–	–
Partner employment status	–	–	49.231	–	–	–	–
Unemployment duration	8.559	14.158	_	4.055	0.174	23.398	0.346
Partner salary	6271.831	15414.344	_	3.220	0.192	11.012	0.381
Number of children	1.138	1.305	_	1.084	0.177	1.002	0.353
Marital status	–	–	93.846	–	–	–	–

Note. Freq. = Frequency estimates indicate percentage of participants who were female, engaged in vigorous forms of physical activity, whose partner is employed, and were married or living full-time with their partner; HE-Social = Consumption of healthy meals with family; HE-Solitary = Consumption of healthy meals alone; PA-Social = Participation in physical activity with family; PA-Solitary = Participating in physical activity alone; MET = Metabolic equivalent values calculated from participants' international physical activity questionnaire responses.

Table 2

Zero-Order Correlations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Life satisfaction	–											
2. Dep. symptoms	-.602***	–										
3. HE-Social	.272***	-.169*	–									
4. HE-Solitary	.105	-.140	.335***	–								
5. PA-Social[a]	.209***	-.185*	.240***	.111	–							
6. PA-Solitary[a]	.250***	-.183*	-.037	.014	.259***	–						
7. Age	-.006	-.082	.365***	.233***	.027	-.072	–					
8. Gender	.022	.075	.094	.033	.034	-.049	.145*	–				
9. Partner emp. status	-.110	.113	-.106	-.033	-.218***	-.045	-.182*	-.111	–			
10. Unemploy. dur.	-.112	.041	.141	.108	-.054	-.091	.008	-.008	.010	–		
11. Partner salary	.145	-.211**	.270***	.074	.137	-.131	.233**	.085	-.435***	-.123	–	
12. Nr. children	.158*	-.192**	.550***	.131	.312***	-.038	.554***	.138	-.195**	.023	.284**	–
13. Marital status	.159*	-.150*	-.127	-.009	-.044	.023	-.133	-.149*	-.066	.086	.126	-.273***

Note. Freq. = Frequency estimates indicate percentage of participants who were female, engaged in vigorous forms of physical activity, and whose partner is employed; HE-Social = Consumption of healthy meals with family; HE-Solitary = Consumption of healthy meals alone; PA-Social = Participation in physical activity with family; PA-Solitary = Participating in physical activity alone; Partner emp. status = Partner employment status; Unemploy. dur. = Unemployment duration; Nr. children = Number of children.

*$p < .05$ **$p < .01$ ***$p < .001$

Table 3

Regression Analyses Predicting Life Satisfaction and Depressive Symptoms

Step	Predictor variable	Dependent variable															
		Life satisfaction								Depressive symptoms							
		β	B	95% CI		*F*	Δ*F*	R^2	ΔR^2	β	B	95% CI		*F*	Δ*F*	R^2	ΔR^2
				LL	UL							LL	UL				
1	Age	-.163	-0.025	-0.065	0.008	1.721	–	.079	–	.056	0.023	-0.063	0.124	2.364*	–	.105	–
	Gender	.054	0.185	-0.386	0.753					.063	0.576	-0.872	2.144				
	Partner emp. status	.048	0.166	-0.515	0.850					.002	0.019	-1.677	1.730				
	Unemploy. dur.	-.108	-0.013	-0.033	0.002					.014	0.005	-0.079	0.046				
	Partner salary	.057	0.001	-0.003	0.006					-.135	-0.009	-0.020	0.001				
	Marital status	.168*	1.203	0.035	2.486					-.214**	-4.062	-6.775	-1.384				
	Nr. children	.221	0.295	-0.020	0.655					-.246*	-0.869	-1.782	-0.102				
2	Age	-.157	-0.024	-0.060	0.007	3.438***	6.015***	.216	.138	.042	0.017	-0.060	0.109	2.871*	3.469*	.187	.082
	Gender	.046	0.159	-0.370	0.671					.069	0.626	-0.716	2.152				
	Partner emp. status	-.005	-0.018	-0.634	0.629					.047	0.425	-1.206	2.042				
	Unemploy. dur.	-.093	-0.012	-0.031	0.006					-.015	-0.005	-0.091	0.033				
	Partner salary	.081	0.002	-0.002	0.006					-.170*	-0.011	-0.022	-0.001				
	Marital status	.124	0.885	-0.581	2.317					-.175*	-3.327	-6.390	-0.051				
	Nr. children	.083	0.110	-0.217	0.484					-.177	-0.628	-1.619	0.175				
	HE-Social	.262**	0.133	0.038	0.231					-.107	-0.144	-0.379	0.109				
	HE-Solitary	.051	0.034	-0.058	0.146					-.070	-0.123	-0.410	0.116				
	PA-Social	.096	0.005	-0.003	0.011					-.084	-0.011	-0.030	0.008				
	PA-Solitary	.257**	0.016	0.005	0.026					-.230**	-0.039	-0.066	-0.012				

Note. β = Standardized regression coefficients; B = Unstandardized regression coefficients; 95% CI = 95% confidence intervals produced from a bootstrap resampling analysis with 10000 replications; *F* = Model *F*-ratio from ANOVA of the regression equation; Δ*F* = Incremental change in model *F*-ratio at each step in the analysis; R^2 = Variance accounted for in the dependent variable; R^2 = Incremental change in variance accounted for at each step in the analysis; HE-Social = Consumption of healthy meals with family; HE-Solitary = Consumption of healthy meals alone; PA-Social = Participation in physical activity with family; PA-Solitary = Participating in physical activity alone; Partner emp. status = Partner employment status; Unemploy. dur. = Unemployment duration; Nr. children = Number of children.

$^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

Figure 1. Expected level of life satisfaction of participants who invest in social or solitary health promoting activities.

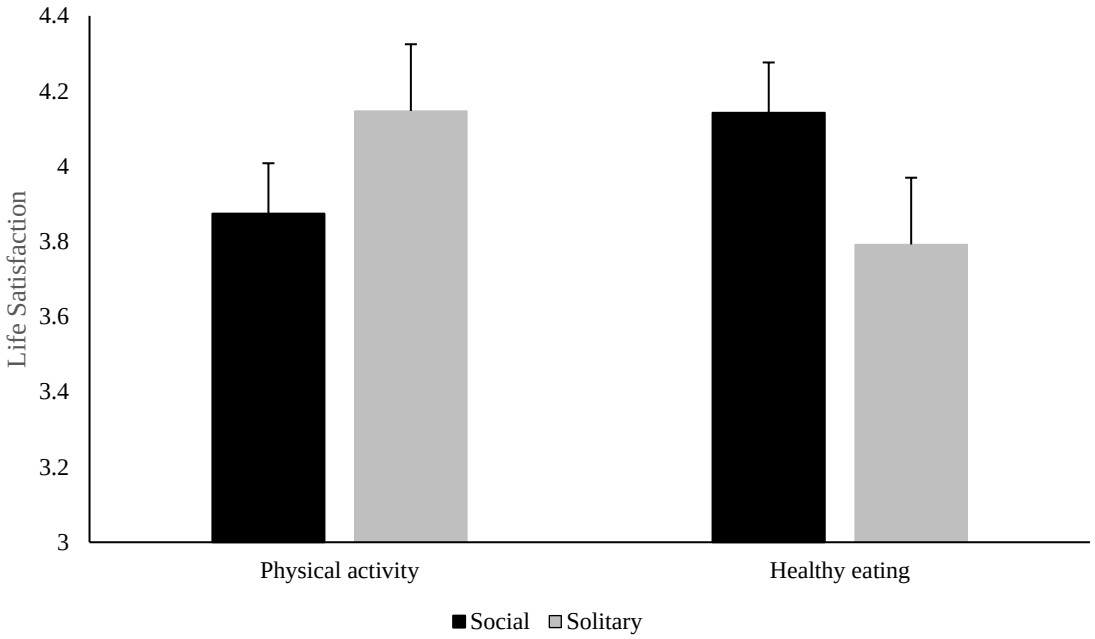

Figure 2. Expected level of depressive symptoms of participants who invest in social or solitary health promoting activities.