

# Subjective Social Status as a Predictor of Loneliness: The Moderating Effect of the Type of Long-Term Care Setting

Research on Aging

1–21

© The Author(s) 2019

Article reuse guidelines:

[sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)

DOI: 10.1177/0164027519871674

[journals.sagepub.com/home/roa](https://journals.sagepub.com/home/roa)Liat Ayalon<sup>1</sup> 

## Abstract

Much has been written about the important role that subjective social status plays in older adults' well-being and subjective health. Less is known, however, about the potential role played by subjective social status in people's sense of loneliness. In the present study, the author examined the role of subjective social status as a predictor of loneliness in adult day care centers (ADCCs) and continuing care retirement communities (CCRCs) over a 1-year period. The main analyses consist of data from 245 respondents (141 ADCC participants and 104 CCRC residents) who completed the interviews in Waves 1 and 2. A significant interaction between subjective social status and type of long-term care setting was found. Higher levels of subjective social status were associated with lower levels of loneliness in CCRCs, but no such association was evident in ADCCs. These findings are interpreted in view of the characteristics of the CCRC as a total institution versus the ADCC as a setting that provides support for only several hours per day, several days per week.

---

<sup>1</sup> The Louis and Gabi Weisfeld School of Social Work, Bar-Ilan University, Ramat-Gan, Israel

## Corresponding Author:

Liat Ayalon, The Louis and Gabi Weisfeld School of Social Work, Bar-Ilan University, Ramat-Gan 52900, Israel.

Email: [liat.ayalon@biu.ac.il](mailto:liat.ayalon@biu.ac.il)

**Keywords**

subjective social status, objective social status, inequality, loneliness, social isolation, long-term care

Social inequality is defined as the uneven distribution of opportunities or resources. Financial status, employment status, and education are social status indicators that represent and contribute to inequality. These indicators have been associated with health, well-being and even mortality (Bolton & Milne, 2016; Brunello, Fort, Schneeweis, & Winter-Ebmer, 2016; Rawshani et al., 2016). Specifically, people who are ranked higher on these indicators are likely to benefit from better health, well-being, and more years to live (Cutler, Huang, & Lleras-Muney, 2015; Demakakos, Biddulph, Bobak, & Marmot, 2016).

Although informative, there are intersections among the various social status indicators, as one might have a high financial status, yet low levels of education, or live in an affluent neighborhood, and have limited income (Assari, 2018; Cubbin, LeClere, & Smith, 2000). Moreover, inequalities are not limited to the individual level, as inequalities also have been noted at the macro-level, including variations across neighborhoods (Chen & Paterson, 2006) and countries (Neumayer & Plümper, 2016). Macro-level inequalities matter and should be taken into account, as people who live in poorer neighborhoods have a higher mortality risk, even when their individual characteristics are taken into account (Bosma, Dike van de Mheen, Borsboom, & Mackenbach, 2001). Similarly, countries vary based on their average life span that has been linked with the country's level of inequality, among other things (Neumayer & Plümper, 2016).

To overcome some of the challenges associated with the study of inequalities, a measure of subjective social status has been developed (Adler, Epel, Castellazzo, & Ickovics, 2000). Subjective social status represents a form of social inequality, derived by one's perceived status on the socioeconomic ladder (Demakakos, Biddulph, de Oliveira, Tsakos, & Marmot, 2018). The rationale is that people compare themselves to others and this in return affects their well-being (Rubin, Evans, & Wilkinson, 2016). Hence, subjective social status represents the perceived relative rather than the absolute placement in the hierarchy (Andersson, 2018). Others have considered subjective social status as the cognitive average of objective indicators (Adler et al., 2000), potentially free of psychological bias (Singh-Manoux, Marmot, & Adler, 2005).

An advantage of subjective measures over objective ones is the fact that they possibly incorporate additional information that cannot be captured by objective indicators (Hoebel, Maske, Zeeb, & Lampert, 2017). Subjective

social status measures possibly incorporate one's feelings and beliefs about his or her status in society, on top of various objective indicators such as education, employment status, or wealth. Subjective social status may also incorporate a reference to the macro-level, thus taking into account one's community of reference, for instance (Brown et al., 2008). Moreover, subjective social status potentially incorporates a multidimensional time perspective, which takes into account past, present, and future perceived statuses (Singh-Manoux et al., 2005). Hence, it is not surprising that some research has found subjective social status to be a better predictor of subjective health than objective indicators (Tang, Rashid, Godley, & Ghali, 2016). For instance, a study conducted among 157 healthy White women has found that subjective social status was a superior predictor of subjective health and mental health compared with objective indicators (Adler et al., 2000). A different study based on data from the United Kingdom concluded that compared with objective indicators, subjective social status was a better predictor of health and change in health among middle-aged people (Singh-Manoux et al., 2005). Others have shown that subjective social status predicts susceptibility to the common cold, possibly via poorer sleep quality (Cohen et al., 2008). These findings have received a substantial support in a recent systematic review that has established a link between subjective social status and health indicators (Zell, Strickhouser, & Krizan, 2018).

## **Subjective Social Status and Loneliness**

Loneliness is defined as the subjective experience of inadequate social relationships (Peplau & Caldwell, 1978). It is distinguished from aloneness, which represents the absence of social ties (Jong-Gierveld, van Tilburg, & Dykstra, 2006). Loneliness has shown to be a very strong predictor of a variety of negative outcomes including poorer mental health and depression, poorer subjective health, worse cardiovascular functioning, and even increased mortality (Gerst-Emerson & Jayawardhana, 2015; Hawkey & Cacioppo, 2003; Hawkey, Preacher, & Cacioppo, 2010; Shiovitz-Ezra & Ayalon, 2010).

Although loneliness is quite prevalent across the entire life span, findings of a systematic review indicate that, compared with middle-aged individuals, both young and old people are more susceptible to the experience of loneliness (Pinquart & Sorensen, 2001). Moreover, in old age, loneliness might be exacerbated by aloneness. Specifically, old people may experience the death of one's spouse and friends, increased disability, which prevents one from engaging in various social interactions, and retirement, which disconnects people from their peers (Ayalon, Shiovitz-Ezra, & Palgi, 2012).

Past research has generally supported a relationship between objective indicators of inequality and loneliness (Lauder, Mummery, & Sharkey, 2006; Theeke, 2010). For instance, those classified as higher earners reported significantly less loneliness as well as those who reported living with others. This association has been explained through a number of potential pathways. First, wealth might be an enabler that allows people to socially engage, or alternatively, the absence of wealth might prohibit people from fully participating in society (Ridge, 2006). Second, financially disadvantaged individuals might have longer working hours, which prevent them from socially interacting with others. Moreover, poorer financial status might be a risk factor for social isolation (Samuel, Alkire, Zavaleta, Mills, & Hammock, 2018) and poorer health and mental health (Mowat, 2019), which in return result in higher levels of loneliness (Hawkey & Kocherginsky, 2018).

Surprisingly, to date, there has been only limited research to look at the relationship between subjective social status and loneliness (Rubin et al., 2016). Although research on the associations between subjective social status and loneliness has been scarce, there is reason to expect a strong association between the two, as they both represent subjective states. Moreover, subjective social status incorporates the state of the individual in relation to his or her community, thus specifically addresses one's perceived social standing (Zell et al., 2018). In light of these arguments, in the present study, the author examined the temporal relationship between subjective social status and loneliness among older adults over a 1-year period.

## **The Role of the Long-Term Care Setting**

The present study was conducted in two different types of long-term care settings: continuing care retirement communities (CCRCs) and adult day care centers (ADCCs). The rationale for this stems from the fact that both settings provide social opportunities to older adults in an attempt to alleviate their sense of loneliness (Buys, 2001; Iecovich & Biderman, 2012). Both settings provide older adults with a variety of structured social opportunities to engage with their peers. Moreover, the settings are limited by age and allow only individuals over a certain age to use their services (Campbell, 2015; Cutchin, 2003). However, whereas older adults in CCRCs are admitted into the setting when they are physically independent (Shippee, 2009), ADCC participants are eligible to enroll only if they are physically impaired (Baumgarten, Lebel, Laprise, Leclerc, & Quinn, 2002). In addition, the funding source of the two settings is different, as CCRC residents pay for the services out of their own pocket, whereas ADCC participants receive

financial support through the government, with the overall goal of keeping them in their community for as long as possible (Borowski & Schmid, 2001). Finally, the framework of services provided by the two settings is different, as CCRCs provide services around the clock, whereas ADCCs provide services only for several hours per day, several days per week.

Past research has shown that older adults in CCRCs report lower levels of loneliness compared with older adults in ADCCs (Ayalon, 2018). Moreover, the social networks in CCRCs appear to be denser and more reciprocal than social networks in ADCCs (Ayalon, Yahav, & Lesser, 2018). It is not surprising then, that research on older adults in CCRCs has often portrayed the transition as a new beginning of beneficial social effects (Ayalon & Greed, 2015). In contrast, research concerning ADCC participants has been more equivocal. Whereas some have noted the presence of friendships and social engagements in ADCCs (Williams & Roberts, 1995), others argued that ADCCs fail to decrease loneliness among older adults (Iecovich & Biderman, 2012), as ADCCs often are characterized by the presence of conflicts and cliques (Salari, Brown, & Eaton, 2006).

## The Present Study

In the present study, the author examined subjective social status as a potential predictor of loneliness in CCRCs versus ADCCs. In light of differences between the two settings, it was expected that one's subjective social status would be a stronger predictor of loneliness among older adults in CCRCs compared with older adults in ADCCs. The rationale for this stems from the fact that these two settings likely allow for a differential association between subjective social standing and loneliness. This is because CCRCs represent a more comprehensive social setting, in which people live, eat, and interact with one another. The CCRC is a round the clock setting, which provides on-site health and social care services to its residents. The ADCC, on the other hand, likely provides fewer opportunities for social interaction, as services are available for several hours per day, several days per week. As such, it is expected that one's subjective social standing would play a more substantial role in one's sense of loneliness in CCRCs compared with the ADCCs.

Although loneliness is not synonymous with objective social indicators, such as number of friends or children, it often correlates with these indicators (Shiovitz-Ezra & Leitsch, 2010; Stokes & Levin, 1986). Because of this association, social indicators of one's standing in the long-term care setting, such as the number of perceived ties with other members in the long-term care setting (e.g., out-degree centrality) or the number of long-term care

members who identify the individual as a significant other (e.g., in-degree centrality), also were examined as potential predictors of loneliness. It is important to note that given the subjective nature of loneliness, subjective social experiences, more so than objective ones, are thought to correlate with loneliness (Shiovitz-Ezra & Leitsch, 2010). Hence, it is expected that one's subjective social standing would play a greater role in one's sense of loneliness, compared with objective social indicators.

As control variables, two indicators of social inequality were examined: education (Lucas, 2001), which is an objective indicator, and subjective financial status (Arber, Fenn, & Meadows, 2014), which similarly to subjective social status incorporates a personal interpretation of the respondent. Subjective financial status differs from subjective social status, though, as the former concerns only financial aspects of one's standing in society (Quon & McGrath, 2014), whereas the latter is open to various other dimensions that are potentially incorporated in the subjective perception of one's standing in society (Adler et al., 2000; Zell et al., 2018). Finally, age and gender also were examined in light of their associations with loneliness as has been found in past research (Maes, Qualter, Vanhalst, Van Den Noortgate, & Goossens, 2016; Yang & Victor, 2011).

This study is important as it provides insights into the temporal relationship between two subjective experiences, namely, loneliness and social status. Both experiences have shown to have a substantial impact on the life of older adults (Demakakos et al., 2018; Hawkey & Kocherginsky, 2018). By examining these experiences in context, the study stresses the significance of long-term care settings in the life of older adults. As these two settings aim to provide older adults with social opportunities and as a result to decrease loneliness (Hanratty, Stow, Collingridge Moore, Valtorta, & Matthews, 2018), it is important to examine potential determinants at the individual level, which play a role in older adults' loneliness. This information can be used by long-term care administrators in the design and operation of social services for older adults.

## **Method**

### *The Sample and Procedure*

The study was supported by a grant from the Israel Science Foundation 537/16. The study was approved by the ethics committee of Bar-Ilan University. Prior to embarking on the study, we obtained the permission of the long-term care administrator to contact study participants in two different types of long-

term care settings: CCRCs and ADCCs. Eligibility criteria were belonging to the respective CCRC or ADCC, speaking Hebrew or English, and being physically and cognitively intact based on the medical record in the long-term care setting. All participants in the respective CCRC and ADCC were invited to participate in the study, provided they met the study's eligibility criteria. Interviews were conducted in a face-to-face format by trained research assistants. Each interview lasted about 1½ hr.

We specifically selected CCRCs and ADCCs of varied geographic locations and sizes. The smallest CCRC had 40 residents, whereas the largest one included 299 residents. Two of the CCRCs were located in Jerusalem (a more religious and conservative city) and one in the center of Israel (a more liberal and affluent location). One CCRC, located in the center of Israel terminated its participation after the completion of Wave 1. Data from this CCRC are not included in the analysis. The smallest ADCC consisted of 75 participants, whereas the largest had 135 participants. Three ADCCs were located in the center of Israel (urban locations) and one in the South (in a rural, isolated area).

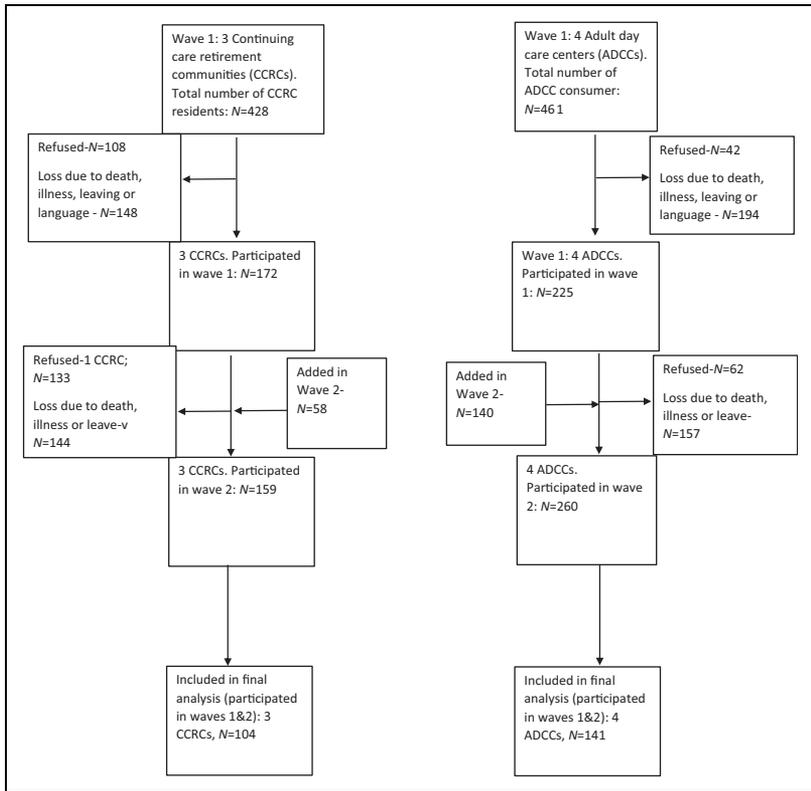
During the first wave of data collection, 172 interviews with CCRC participants were conducted, and in Wave 2, 159 CCRC residents were interviewed. As for ADCC residents, 225 interviews with ADCC participants were conducted in the first wave, whereas in the second wave, 260 interviews were conducted (see Figure 1 for sample flow). The main analyses consist of data from 245 respondents (141 ADCC participants and 104 CCRC residents) who completed the interviews in Waves 1 and 2 (collected between 2016 and 2018; spread about 1 year apart). Figure 1 demonstrates the sample flow across the two waves of data collection.

As can be seen in Table 1, there were significant differences between CCRC residents and ADCC participants on all study variables, with the exception of loneliness at follow-up, which did not differ across the two settings. CCRC residents were significantly less lonely, reported a higher subjective social status, more outgoing (out-degree centrality) and incoming ties (in-degree centrality) with other members in the setting, more years of education, and better subjective financial status than ADCC participants. CCRC participants also were significantly older than ADCC participants.

## Measures

### *Dependent variable*

*Loneliness.* A shortened version of one of the most widely used scales of loneliness, the Revised UCLA Loneliness Scale (Hughes, Waite, Hawkey, & Cacioppo, 2004), was administered. The measure includes three questions.



**Figure 1.** Sample flow.

Respondents were asked to rate, on a 3-point scale, how often they felt as if they (a) lacked companionship, (b) were left out, or (c) were others. A mean isolated from score was calculated, with a higher overall score representing higher loneliness (range 1–3;  $\alpha = .83$  across settings). This measure has been previously used in Hebrew (Ayalon, 2014).

### *Independent variable*

*MacArthur Scale of Subjective Social Status.* This is a 10-rung ladder of subjective social standing (Adler et al., 2000). Participants are asked to mark the rung that best represents their social position within their own community. On the top, rung are the most well-off individuals, whereas the worst-to-do are at the bottom of the ladder. This version has been used in past research

**Table 1.** Sample Characteristics in Continuing Care Retirement Communities (CCRCs) and Adult Day Care Centers (ADCCs).

Variable	CCRC			ADCC			Differences Between the Settings			
	n	Mean %	SD	Range	n	Mean %	SD	Range	t test/ $\chi^2$	p Value
Loneliness (baseline)	169	1.51	0.64	1-3	221	1.76	0.70	1-3	-3.63	<.001
Loneliness (follow-up)	103	1.63	0.67	1-3	141	1.63	0.63	1-3	.09	.93
Subjective social status	118	7.50	1.71	0-10	201	6.63	2.45	0-10	3.74	<.001
Out-degree	172	12.24	14.84	0-80	225	6.18	9.00	0-62	4.73	<.001
In-degree	172	12.24	8.44	1-54	225	6.16	5.25	0-28	8.3	<.001
Education (years)	171	13.09	4.87	0-40	219	8.50	4.73	0-23	9.34	<.001
Financial status	170	2.55	0.69	1-4	220	2.20	0.79	1-4	4.69	<.001
Age	161	84.95	7.03	67.15-117.06	217	82.52	6.82	64.36-100.08	3.36	<.001
Women	171	80.7			221	68.8			7.12	.007

with primarily White women (Ghaed & Gallo, 2007), Black from the South of the United States (Reitzel, Nguyen, Strong, Wetter, & McNeill, 2013), Brazilians (Giatti, do Valle Camelo, de Castro Rodrigues, & Barreto, 2012), and others. This measure has been previously used in Hebrew (Ayalon, 2008).

### Covariates

*The sociocentric network.* Each respondent received a list of names of all individuals receiving services in the respective ADCC or CCRC. All names appeared on the list, unrelated to whether or not these individuals participated in the present study. The following question was used in order to construct the social network: "Please indicate whether you know the following person [Name of all ADCC Users/CCRC residents]." Respondents, who indicated whether or not they know another person, reported on directed ties because person A may know person B, but person B may not be familiar with person A or may opt not to respond.

We calculated an *in-degree centrality score* by summing up all ingoing ties (e.g., How many times the individual was nominated as a significant other by others in his or her network?). We also calculated an *out-degree centrality score*, which reflects the number of outgoing ties (e.g., the number of network members the ego identified as likely to share his or her thoughts and feelings with).

Years of education, subjective financial status (1 = *cannot make ends meet*, 4 = *excellent*), age, and gender were gathered based on self-report.

### Analysis

Descriptive statistics were obtained, while comparing the two settings (ADCCs vs. CCRCs). These comparisons consisted of  $\chi^2$  analyses in the case of categorical variables and *t* tests in the case of continuous variables. Subsequently, correlations between all study variables were obtained for each setting separately. This was followed by a hierarchical regression analysis with loneliness as an outcome variable. In the first step, subjective social status and loneliness at baseline were examined. Next, social network indicators (in-degree and out-degree) were included in the model. The third step included subjective social status, social network indicators, education, subjective financial status, age, gender, and long-term care setting type. Finally, interactions between study variables (subjective social status, social network indicators) and long-term care setting type were added to the model. Only significant interactions were maintained in the final model. The significant interaction effect was graphed in order to improve the interpretation of the

findings. Analysis was conducted using R (Core Team, 2013), and the social network indicators (in-degree and out-degree centrality) were derived using the Igraph package, version 1.2.4.1. (Csardi & Nepusz, 2006).

## Results

### *Correlations Between Study Variables in Each of the Long-Term Care Settings*

The first set of correlations was limited to *ADCCs*. There was a significant correlation between loneliness in Wave 1 and loneliness in Wave 2 ( $r = .32, p < .001$ ). Loneliness in Wave 1 was significantly negatively correlated with education ( $r = -.22, p < .05$ ) and with subjective financial status ( $r = -.27, p < .01$ ). Loneliness at follow-up was significantly negatively associated with subjective financial status ( $r = -.22, p < .01$ ). Subjective social status was associated with gender ( $r = .20, p < .05$ ). Out-degree centrality and in-degree centrality were correlated ( $r = .40, p < .001$ ). In-degree centrality was negatively associated with subjective financial status ( $r = -.17, p < .05$ ) and with age ( $r = -.34, p < .001$ ). Education was associated with subjective financial status ( $r = .29, p < .001$ ) and with gender ( $r = .28, p < .001$ ).

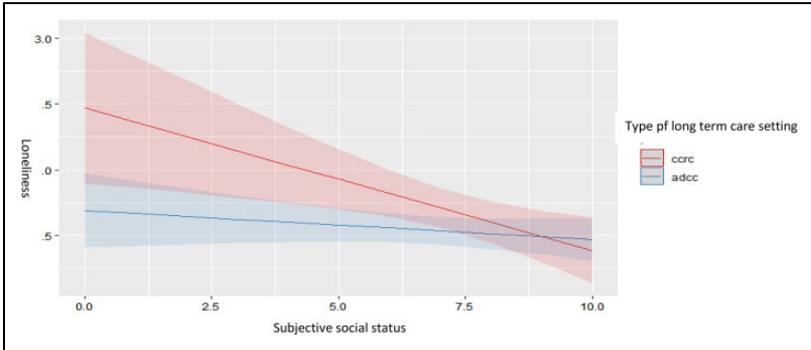
The next set of correlations was restricted to *CCRCs*. There was a significant correlation between loneliness in Wave 1 and loneliness in Wave 2 ( $r = .65, p < .001$ ). Loneliness in Wave 1 was significantly negatively correlated with subjective social status ( $r = -.36, p < .001$ ). Loneliness at follow-up was significantly negatively associated with subjective social status ( $r = -.49, p < .001$ ), out-degree centrality ( $r = -.24, p < .05$ ), in-degree centrality ( $r = -.22, p < .05$ ), and gender ( $r = -.20, p < .05$ ). Subjective social status was associated with out-degree centrality ( $r = .25, p < .05$ ) and in-degree centrality ( $r = .28, p < .05$ ). Out-degree centrality and in-degree centrality were correlated ( $r = .56, p < .001$ ). Out-degree centrality was negatively associated with gender ( $r = -.29, p < .01$ ). Education was negatively associated with age ( $r = -.41, p < .001$ ).

Table 2 summarizes the hierarchical regression analysis. In *Step 1*, in addition to loneliness at baseline, subjective social status was a significant predictor of loneliness 1 year later. In *the next model*, out-degree and in-degree centrality measures were entered into the model in addition to already included variables: loneliness at baseline and subjective social status. Out-degree and in-degree centrality measures were not significant predictors of loneliness, and the  $R^2$  did not change. *Finally*, when education, subjective financial status, age, and gender were entered into the model (on top of

**Table 2.** Hierarchical Regression Analysis With Loneliness at Follow-up as an Outcome Variable.

Variable	B	SE	$\beta$	B	SE	$\beta$	B	SE	$\beta$
(Intercept)	1.30	.17	.00***	1.34	.18	.00***	1.94	.63	.00***
Loneliness at baseline	0.38	.06	.41***	0.37	.06	.39***	0.36	.06	.39
Subjective social status	-0.04	.02	-.16*	-0.04	.02	-.15*	-0.04	.02	-.15*
Out-degree				-0.01	.00	-.10	-0.01	.00	-.12
In-degree				0.00	.01	-.00	-0.00	.01	-.05
Age							0.00	.01	.00
Sex (men: reference category)							-0.14	.09	-.10
Education							-0.01	.01	-.07
Subjective financial status							-0.06	.05	-.09
Long-term care setting type							-0.16	.10	-.13
Long-term care setting type (ADCC: reference category)									
Subjective Social Status $\times$ Long-Term Care Setting Type							0.09	.04	.54*
R <sup>2</sup>	0.22			.22			0.27		

Note. ADCC = adult day care centers.



**Figure 2.** Loneliness as a function of subjective social status in continuing care retirement communities and adult day care centers.

variables entered in Steps 1 and 2), results remained consistent. The only significant interaction was between subjective social status and type of long-term care setting. This resulted in an increase in  $R^2$  of 2%. In this *final model*, in addition to loneliness at baseline, there was a significant interaction between subjective social status and type of long-term care setting. This interaction can be seen in Figure 2. Specifically, higher levels of subjective social status were negatively associated with loneliness at follow-up in CCRCs ( $B = -.11, SE = .04, \beta = .41, p < .001$ ) but not in ADCCs ( $B = -.02, SE = .02, \beta = -.08, p = .27$ ). There was no evidence for multicollinearity, with the highest variance inflation factors (VIF) being 1.64 (with the exception of the interaction product and long-term care setting type, which had high VIF). This, however, was ignored due to expected multicollinearity due to the inclusion of the interaction term (Allison, 2012).

## Discussion

In the present study, the author evaluated the moderating role of the type of long-term care setting with regard to the relationship between subjective social status and loneliness. This is important for several reasons. First, it draws attention to an important phenomenon, namely, loneliness among older adults in long-term care. Given the major impact that loneliness has on the health and well-being of older adults (Golden et al., 2009; Perissinotto, Cenzer, & Covinsky, 2012) and the fact that long-term care institutions specifically attempt to reduce loneliness by providing social stimulation to older adults (Brimelow & Wollin, 2017), it is important to examine

loneliness in these settings. Second, to date, subjective social status has not been examined substantially in relation to loneliness. However, because this subjective indicator likely incorporates both objective *experiences* and subjective perceptions of the individual in relation to others in the community, drawing attention to this concept is important as it provides a more comprehensive understanding of long-term care consumers in the unique context of the long-term care setting. Hence, this study puts the individual subjective experiences within the social context of long-term care. Finally, the study distinguishes between subjective and objective social indicators. By examining the role of both subjective and objective social indicators with regard to loneliness, this study possibly provides greater clarity regarding the concept of loneliness and stresses its subjective characteristics.

A major finding in the present study concerns the moderating role of the type of long-term care setting. Specifically, subjective social status was negatively correlated with loneliness in CCRCs but not in ADCCs. Hence, in CCRCs, older adults who perceive their social status as low are more likely to report higher levels of loneliness. In ADCCs, on the other hand, this association does not exist—whether one perceived himself or herself to be at the top or at the bottom of the hierarchy plays no role in one's levels of loneliness. This finding is expected as the CCRC likely represents a more intensive long-term care setting, in which one's perceived position actually matters (Ayalon et al., 2018). In contrast, ADCCs provide only a temporal social outlet in the form of several hours per day, several days per week. In such a context, it appears that one's subjective social status plays a lesser role. Possibly, relationships with people outside the ADCC and subjective status in one's community of residence, rather than in the ADCC, play a greater role in feelings of loneliness.

The number of individuals in the settings who identify the respondent as a significant other (in-degree centrality) and the number of individuals who are identified as significant others by the respondent (out-degree centrality) played no role in determining one's levels of loneliness in the overall model. This finding is supported by past research, which has shown that subjective indicators, such as perceived support, play a greater role in people's sense of loneliness than objective indicators, such as number of friends (Shiovitz-Ezra & Leitsch, 2010). As loneliness is the feeling of distress over perceived inadequate social relations, it is not surprising that one's subjective social status, rather than objective indicators, such as number of friends, play a role in determining one's sense of loneliness.

The two additional indicators of inequality used in this study, namely, education and subjective financial status did not correlate with loneliness in

the final regression model. This finding is surprising given past research, which has found associations between loneliness and socioeconomic status (Lauder et al., 2006; Theeke, 2010). This could be possibly attributed to the important role played by one's subjective social status. Possibly, in the CCRC context, one's subjective social status is of greater significance than other sources of inequality. In the ADCC context, however, none of these sources of inequality played a role.

The present findings should be viewed in light of the study's limitations. First, although it is quite common in this type of research with older adults who rely on long-term care to lose a large portion of the sample to illness or death over time, loss to follow-up and limited participation even at baseline, likely preclude the ability to generalize the findings to the frailest older adults, who did not participate in the present study yet presented with different social network characteristics as was found in past research (Ayalon et al., 2018). Second, the selection of CCRCs and ADCCs was based on a purposive sample rather than on a representative sample. It is important to note though that there is a strong rationale for using purposive sampling when it comes to entities such as long-term care institutions, which have not been explored extensively in the past. Finally, the amount of variability explained by the interaction term (e.g., type of long-term care setting) was small, suggesting that other factors potentially not examined in this study account for most of the variability associated with loneliness.

Despite its limitations, the findings provide insights into a relatively unexplored temporal association between loneliness and subjective social status. By doing so, the findings point to the intersection between the social context and one's individual characteristics. Results demonstrate that subjective social status predicts change in loneliness over a 1-year period in CCRCs but not in ADCCs. These findings are interpreted in view of the characteristics of the CCRC as a total institution. Long-term care administrators could capitalize on the findings to enhance sense of social status in CCRCs as a means to alleviate loneliness. Moreover, the findings point to the very important role played by the CCRC community of reference compared with the ADCC community, which appears to play a lesser role. As both settings potentially attempt to provide older adults with social opportunities in order to decrease their sense of loneliness, it is clear that the CCRC setting plays a more influential role in the lives of older adults. Long-term care administrators should explore ways to enhance the role played by the ADCC in order to better target loneliness in this population of ADCC consumers.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The authors received funding from Israel Science Foundation (Grant no. 537/16).

## ORCID iD

Liat Ayalon  <https://orcid.org/0000-0003-3339-7879>

## References

- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology, 19*, 586.
- Allison, P. (2012). When can you safely ignore multicollinearity. *Statistical Horizons, 5*. Retrieved from <https://statisticalhorizons.com/multicollinearity>
- Andersson, M. A. (2018). An odd ladder to climb: Socioeconomic differences across levels of subjective social status. *Social Indicators Research, 136*, 621–643. doi:10.1007/s11205-017-1559-7
- Arber, S., Fenn, K., & Meadows, R. (2014). Subjective financial well-being, income and health inequalities in mid and later life in Britain. *Social Science & Medicine, 100*, 12–20. doi:10.1016/j.socscimed.2013.10.016
- Assari, S. (2018). Life expectancy gain due to employment status depends on race, gender, education, and their intersections. *Journal of Racial and Ethnic Health Disparities, 5*, 375–386. doi:10.1007/s40615-017-0381-x
- Ayalon, L. (2008). Subjective socioeconomic status as a predictor of long-term care staff burnout and positive caregiving experiences. *International Psychogeriatrics, 20*, 521–537. doi:10.1017/S1041610207006175
- Ayalon, L. (2014). Profiles of loneliness in the caregiving unit. *The Gerontologist, 56*, 201–214. doi:10.1093/geront/gnu046
- Ayalon, L. (2018). Loneliness and anxiety about aging in adult day care centers and continuing care retirement communities. *Innovation in Aging, 2*, igy021. doi:10.1093/geroni/igy021
- Ayalon, L., & Greed, O. (2015). A typology of new residents' adjustment to continuing care retirement communities. *The Gerontologist, 56*, 641–650. doi:10.1093/geront/gnu121

- Ayalon, L., Shiovitz-Ezra, S., & Palgi, Y. (2012). No place like home? Potential pathways to loneliness in older adults under the care of a live-in foreign home care worker. *The Journal of Psychology, 146*, 189–200. doi:10.1080/00223980.2011.574169
- Ayalon, L., Yahav, I., & Lesser, O. (2018). From a bird's eye view: A social network perspective on older adults in adult day care centers and continuing care retirement communities. *Innovation in Aging*. doi:10.1093/geroni/igy024
- Baumgarten, M., Lebel, P., Laprise, H., Leclerc, C., & Quinn, C. (2002). Adult day care for the frail elderly: Outcomes, satisfaction, and cost. *Journal of Aging and Health, 14*, 237–259. doi:10.1177/089826430201400204
- Bolton, E., & Milne, B. (2016). Socioeconomic status and all-cause mortality: Testing life course hypotheses in New Zealand. Paper presented at the COMPASS Autumn Seminar Series 2016, University of Auckland, Auckland.
- Borowski, A., & Schmid, H. (2001). Israel's long-term care insurance law after a decade of implementation. *Journal of Aging & Social Policy, 12*, 49–71.
- Bosma, H., Dike van de Mheen, H., Borsboom, G. J., & Mackenbach, J. P. (2001). Neighborhood socioeconomic status and all-cause mortality. *American Journal of Epidemiology, 153*, 363–371. doi:10.1093/aje/153.4.363
- Brimelow, R. E., & Wollin, J. A. (2017). Loneliness in old age: Interventions to curb loneliness in long-term care facilities. *Activities, Adaptation & Aging, 41*, 301–315. doi:10.1080/01924788.2017.1326766
- Brown, R. A., Adler, N. E., Worthman, C. M., Copeland, W. E., Costello, E. J., & Angold, A. (2008). Cultural and community determinants of subjective social status among Cherokee and White youth. *Ethnicity & Health, 13*, 289–303. doi:10.1080/13557850701837302
- Brunello, G., Fort, M., Schneeweis, N., & Winter-Ebmer, R. (2016). The causal effect of education on health: What is the role of health behaviors? *Health Economics, 25*, 314–336. doi:10.1002/hec.3141
- Buys, L. R. (2001). Life in a retirement village: Implications for contact with community and village friends. *Gerontology, 47*, 55–59. doi:10.1159/000052771
- Campbell, N. (2015). Designing for social needs to support aging in place within continuing care retirement communities. *Journal of Housing and the Built Environment, 30*, 645–665. doi:10.1007/s10901-015-9437-6
- Chen, E., & Paterson, L. Q. (2006). Neighborhood, family, and subjective socioeconomic status: How do they relate to adolescent health? *Health Psychology, 25*, 704. doi:10.1037/0278-6133.25.6.704
- Cohen, S., Alper, C. M., Doyle, W. J., Adler, N., Treanor, J. J., & Turner, R. B. (2008). Objective and subjective socioeconomic status and susceptibility to the common cold. *Health Psychology, 27*, 268. doi:10.1037/0278-6133.27.2.268
- Csardi, G., & Nepusz, T. (2006). The igraph software package for complex network research. *InterJournal, Complex Systems, 1695*, 1–9.

- Cubbin, C., LeClere, F. B., & Smith, G. S. (2000). Socioeconomic status and injury mortality: Individual and neighbourhood determinants. *Journal of Epidemiology & Community Health, 54*, 517–524. doi:10.1136/jech.54.7.517
- Cutchin, M. P. (2003). The process of mediated aging-in-place: A theoretically and empirically based model. *Social Science & Medicine, 57*, 1077–1090.
- Cutler, D. M., Huang, W., & Lleras-Muney, A. (2015). When does education matter? The protective effect of education for cohorts graduating in bad times. *Social Science & Medicine, 127*, 63–73. doi:10.3386/w20156
- Demakakos, P., Biddulph, J. P., Bobak, M., & Marmot, M. G. (2016). Wealth and mortality at older ages: A prospective cohort study. *Journal of Epidemiology and Community Health, 70*, 346–353. doi:10.1136/jech-2015-206173
- Demakakos, P., Biddulph, J. P., de Oliveira, C., Tsakos, G., & Marmot, M. G. (2018). Subjective social status and mortality: The English longitudinal study of ageing. *European Journal of Epidemiology, 33*, 729–739. doi:10.1007/s10654-018-0410-z
- Gerst-Emerson, K., & Jayawardhana, J. (2015). Loneliness as a public health issue: The impact of loneliness on health care utilization among older adults. *American Journal of Public Health, 105*, 1013–1019. doi:10.2105/AJPH.2014.302427
- Ghaed, S. G., & Gallo, L. C. (2007). Subjective social status, objective socioeconomic status, and cardiovascular risk in women. *Health Psychology, 26*, 668. doi:10.1037/0278-6133.26.6.668
- Giatti, L., do Valle Camelo, L., de Castro Rodrigues, J. F., & Barreto, S. M. (2012). Reliability of the MacArthur scale of subjective social status—Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). *BMC Public Health, 12*, 1096. doi:10.1186/1471-2458-12-1096
- Golden, J., Conroy, R. M., Bruce, I., Denihan, A., Greene, E., Kirby, M., & Lawlor, B. A. (2009). Loneliness, social support networks, mood and wellbeing in community-dwelling elderly. *International Journal of Geriatric Psychiatry, 24*, 694–700. doi:10.1002/gps.2181
- Hanratty, B., Stow, D., Collingridge Moore, D., Valtorta, N. K., & Matthews, F. (2018). Loneliness as a risk factor for care home admission in the English longitudinal study of ageing. *Age and Ageing, 47*, 896–900. doi:10.1093/ageing/afy095
- Hawkey, L. C., & Cacioppo, J. T. (2003). Loneliness and pathways to disease. *Brain, Behavior, and Immunity, 17*, 98–105.
- Hawkey, L. C., & Kocherginsky, M. (2018). Transitions in loneliness among older adults: A 5-year follow-up in the National Social Life, Health, and Aging Project. *Research on Aging, 40*, 365–387. doi:10.1177/0164027517698965
- Hawkey, L. C., Preacher, K. J., & Cacioppo, J. T. (2010). Loneliness impairs daytime functioning but not sleep duration. *Health Psychology, 29*, 124. doi:10.1037/a0018646

- Hoebel, J., Maske, U. E., Zeeb, H., & Lampert, T. (2017). Social inequalities and depressive symptoms in adults: The role of objective and subjective socioeconomic status. *PLoS One*, *12*, e0169764. doi:10.1371/journal.pone.0169764
- Hughes, M. E., Waite, L. J., Hawkey, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, *26*, 655–672. doi:10.1177/0164027504268574
- Iecovich, E., & Biderman, A. (2012). Attendance in adult day care centers and its relation to loneliness among frail older adults. *International Psychogeriatrics*, *24*, 439–448. doi:10.1017/S1041610211001840
- Jong-Gierveld, J. D., van Tilburg, T. G., & Dykstra, P. A. (2006). Loneliness and social isolation. In D. Perlman & A. Vangelisti (Eds.), *The Cambridge handbook of personal relationships* (pp. 485–500). Cambridge, England: Cambridge University Press.
- Lauder, W., Mummery, K., & Sharkey, S. (2006). Social capital, age and religiosity in people who are lonely. *Journal of Clinical Nursing*, *15*, 334–340. doi:10.1111/j.1365-2702.2006.01192.x
- Lucas, S. R. (2001). Effectively maintained inequality: Education transitions, track mobility, and social background effects. *American Journal of Sociology*, *106*, 1642–1690. doi:10.1086/321300
- Maes, M., Qualter, P., Vanhalst, J., Van Den Noortgate, W., & Goossens, L. (2016). *Gender differences in loneliness across the lifespan: A meta-analysis*. Paper presented at the Biennial meeting of the International Society for the Study of Behavioral Development, July 10–14, 2016, Vilnius, Lithuania.
- Mowat, J. G. (2019). Exploring the impact of social inequality and poverty on the mental health and wellbeing and attainment of children and young people in Scotland. *Improving Schools*. doi:10.1177/1365480219835323
- Neumayer, E., & Plümper, T. (2016). Inequalities of income and inequalities of longevity: A cross-country study. *American Journal of Public Health*, *106*, 160–165. doi:10.2105/AJPH.2015.302849
- Peplau, L. A., & Caldwell, M. A. (1978). Loneliness: A cognitive analysis. *Essence: Issues in the Study of Ageing, Dying, and Death*, *2*, 207–220.
- Perissinotto, C. M., Cenzer, I. S., & Covinsky, K. E. (2012). Loneliness in older persons: A predictor of functional decline and death. *Archives of Internal Medicine*, *172*, 1078–1084. doi:10.1001/archinternmed.2012.1993
- Pinquart, M., & Sorensen, S. (2001). Influences on loneliness in older adults: A meta-analysis. *Basic and Applied Social Psychology*, *23*, 245–266. doi:10.1207/S15324834BASP2304\_2
- Quon, E. C., & McGrath, J. J. (2014). Subjective socioeconomic status and adolescent health: A meta-analysis. *Health Psychology*, *33*, 433. doi:10.1037/a0033716

- R Core Team. (2013). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.
- Rawshani, A., Svensson, A. M., Zethelius, B., Eliasson, B., Rosengren, A., & Gudbjörnsdóttir, S. (2016). Association between socioeconomic status and mortality, cardiovascular disease, and cancer in patients with Type 2 diabetes. *JAMA Internal Medicine, 176*, 1146–1154. doi:10.1001/jamainternmed.2016.2940
- Reitzel, L. R., Nguyen, N., Strong, L. L., Wetter, D. W., & McNeill, L. H. (2013). Subjective social status and health behaviors among African Americans. *American Journal of Health Behavior, 37*, 104–111. doi:10.5993/AJHB.37.1.12
- Ridge, T. (2006). Childhood poverty: A barrier to social participation and inclusion. In *Children, young people and social inclusion: Participation for what* (pp. 23–38). doi:10.1332/policypress/9781861346629.003.0002
- Rubin, M., Evans, O., & Wilkinson, R. B. (2016). A longitudinal study of the relations among university students' subjective social status, social contact with university friends, and mental health and well-being. *Journal of Social and Clinical Psychology, 35*, 722–737. doi:10.1521/jscp.2016.35.9.722
- Salari, S., Brown, B. B., & Eaton, J. (2006). Conflicts, friendship cliques and territorial displays in senior center environments. *Journal of Aging Studies, 20*, 237–252. doi:10.1016/j.jaging.2005.09.004
- Samuel, K., Alkire, S., Zavaleta, D., Mills, C., & Hammock, J. (2018). Social isolation and its relationship to multidimensional poverty. *Oxford Development Studies, 46*, 83–97.
- Shiovitz-Ezra, S., & Ayalon, L. (2010). Situational versus chronic loneliness as risk factors for all-cause mortality. *International Psychogeriatrics, 22*, 455–462. doi:10.1017/S1041610209991426
- Shiovitz-Ezra, S., & Leitsch, S. A. (2010). The role of social relationships in predicting loneliness: The national social life, health, and aging project. *Social Work Research, 34*, 157–167. doi:10.1093/swr/34.3.157
- Shippee, T. P. (2009). “But I am not moving”: Residents' perspectives on transitions within a continuing care retirement community. *The Gerontologist, 49*, 418–427. doi:10.1093/geront/gnp030
- Singh-Manoux, A., Marmot, M. G., & Adler, N. E. (2005). Does subjective social status predict health and change in health status better than objective status? *Psychosomatic Medicine, 67*, 855–861. doi:10.1097/01.psy.0000188434.52941.a0
- Stokes, J. P., & Levin, I. (1986). Gender differences in predicting loneliness from social network characteristics. *Journal of Personality and Social Psychology, 51*, 1069.
- Tang, K. L., Rashid, R., Godley, J., & Ghali, W. A. (2016). Association between subjective social status and cardiovascular disease and cardiovascular risk factors:

- A systematic review and meta-analysis. *BMJ Open*, 6, e010137. doi:10.1136/bmjopen-2015-010137
- Theeke, L. A. (2010). Sociodemographic and health-related risks for loneliness and outcome differences by loneliness status in a sample of U.S. older adults. *Research in Gerontological Nursing*, 3, 113–125. doi:10.3928/19404921-20091103-99
- Williams, B., & Roberts, P. (1995). Friends in passing: Social interaction at an adult day care center. *The International Journal of Aging and Human Development*, 41, 63–78.
- Yang, K., & Victor, C. (2011). Age and loneliness in 25 European nations. *Ageing & Society*, 31, 1368–1388. doi:10.2190/GHHW-V1QR-NACX-VBCB
- Zell, E., Strickhouser, J. E., & Krizan, Z. (2018). Subjective social status and health: A meta-analysis of community and society ladders. *Health Psychology*, 37, 979. doi:10.1037/hea0000667

### **Author Biography**

Liat Ayalon is a clinical psychologist and a researcher at Bar Ilan University. She is the coordinator of an international PhD program funded by the European Commission under H2020 (EuroAgeism.com). Her research concern ageism, older adults' social networks and long term care settings.