Solitary Prosociality in Later Life: An Experience Sampling Study

Ajit Singh Mann, MA, Jordan Boeder, MA, Dwight C. K. Tse, PhD, Laura Graham, PhD, and Jeanne Nakamura, PhD

Claremont Graduate University

Author Note

Ajit Singh Mann, Jordan Boeder, Dwight C. K. Tse, Laura Graham, and Jeanne Nakamura, Department of Psychology, Claremont Graduate University.

Dwight C. K. Tse is now at the University of Strathclyde. Laura Graham is now at the University of California, Riverside.

Correspondence concerning this paper should be addressed to Ajit Singh Mann, Department of Psychology, Claremont Graduate University, 150 E. 10th Street, Claremont, CA 91711, USA.

Email: ajit.singh.mann@cgu.edu

Declaration of Conflicting Interest

The authors declare that there is no conflict of interest.

Funding

This work was supported by Grant 60762 from the John Templeton Foundation. The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the John Templeton Foundation.

Abstract

Loneliness is a risk factor for older adults, one exacerbated by the COVID-19 pandemic. Although time spent alone is associated with both loneliness and greater well-being, the experience of solitude may depend on the type of activity pursued. We examined formal prosocial activity as one facilitator of positive solitary experiences. Older adults (N=165, M_{age}=71.13, SD=5.70) highly committed to prosocial-program work (e.g., tutoring) filled out surveys at six random times every day for a week. Using multilevel modeling, we investigated whether participating in prosocial-program activity alone was associated with greater well-being compared to other solitary activity. While prosocial activity did not buffer against negative affect in solitude, it promoted positive affect and relatedness even when alone. To the extent that prosocial work can facilitate positive solitary experiences by enhancing feelings of connection, it may protect against threats to well-being posed by loneliness in later life especially during times of social distancing.

Keywords: loneliness, well-being, volunteering, older adults, COVID-19

Solitary Prosociality in Later Life: An Experience Sampling Study

Time spent alone increases with age, and older adults spend the majority of their time in solitude (Chui et al., 2014; Larson, 1990; Pauly et al., 2017). Solitude, the absence of social interaction with others (Larson, 1990), is often characterized as a negative experience marred by feelings of loneliness (Lay et al., 2019), and consequently, emotional experiences in solitude tend to be worse than interactive experiences (Chui et al., 2014; Klumb, 2004; Larson, 1990). Although solitude is generally less negative for older adults, compared to younger adults (Pauly et al., 2017), this may hold only in situations when solitude is desired (Lay et al., 2020). When functional decline in later life (Luo et al., 2012) or unprecedented circumstances such as the COVID-19 pandemic (Krendl & Perry, 2020) inhibit social contact with others, being alone despite wanting to be with others can be costly. Specifically, loneliness in later life is associated with poorer mental health (Coyle & Dugan, 2012), feelings of hostility (Segel-Karpas & Ayalon, 2020), an increased likelihood of inactivity and higher blood pressure (Shankar et al., 2011), in addition to coronary heart disease and increased mortality (Steptoe et al., 2013). Thus, protective factors against the detrimental effects of loneliness warrant attention, especially among older adults.

Acknowledging the dark side of solitary experiences, solitude is not inherently unpleasant. For instance, solitary experiences are associated with decreased self-consciousness (Larson et al., 1982) and a greater sense of control (Larson et al., 1985). Whether solitude is a positive experience accompanied by a sense of renewal and relaxation, or a negative experience characterized by loneliness may depend on the type of activity in which one is engaged (Nguyen et al., 2018). Although recent research suggests that older adults feel less positive and more negative emotions, in addition to experiencing greater pain when involved in an activity alone

(Lam & García-Román, 2020), these findings emerge from a sample of older adults whose solitary experiences were primarily spent in leisure or household activities; activities that are not necessarily productive. Past research has established that in general, productive activities positively predict well-being among older adults (Vozikaki et al., 2017), perhaps because they provide an avenue to fulfill the basic psychological need for competence, a key predictor of well-being (Ryan & Deci, 2000; Ryan et al., 2019) that does not necessarily rely on the presence of others.

Amongst the many possible productive activities undertaken by older adults, formal prosocial activity (e.g., volunteering; Warburton et al., 2007) may be an especially important activity that can attenuate the ill-effects of solitude. Volunteering is a common type of prosocial behavior in later life (Morrow-Howell, 2010) with 23.5% of U.S. older adults involved in such activities (Bureau of Labor Statistics, 2016). Previous research on prosociality has mostly assumed that prosocial activities are socially interactive by nature and past investigations have suggested that the salubrious effect of volunteer work is at least partly due to increased social interaction (e.g., Brown et al., 2012). While this may be true for some volunteer work, not all prosocial tasks are interactive. For instance, volunteer tutors may spend hours in solitude preparing teaching materials, just as non-profit program directors may work on a variety of administrative duties alone. These tasks do not fit the conventional impression of prosocial activities, but they are, inherently, productive activities for a greater purpose beyond oneself (Pilkington et al., 2012). Therefore, the investigation of prosocial activity in solitary contexts is warranted.

Not only is formal volunteering common in older adulthood, it is also negatively related to depressive symptomatology (Morrow-Howell et al., 2003) and positively to social well-being

(Son & Wilson, 2012). Although research on the affective benefits of prosocial activity in daily life is scarce (e.g., Han et al., 2020), previous analyses of the current data suggest that the momentary experience during prosocial activity is associated with greater positive, but also greater negative affect (Nakamura et al., 2020). In the absence of immediate social interaction, is solitary prosocial activity associated with a more positive emotional experience relative to its non-prosocial counterpart? The current study seeks to address this central question by exploring whether participating in formal prosocial activity moderates the emotional experience associated with solitude.

In addition to the potential of a positive affective balance, feelings of intimacy and connectedness may also emerge during solitude (Long & Averill, 2003), representing a direct contrast to the experience of loneliness. Previous analyses of the current data found a positive association between instances of prosocial activity and feelings of relatedness (Nakamura et al., 2020); whether this holds within the bounds of solitude is currently unknown but is reasonable to expect. For example, when alone, a volunteer may feel a greater sense of connectedness with others while planning the itinerary for the next food drive than while drafting a list of personal errands. As social connectedness is a subjective psychological experience that individuals feel in relation to others (Haslam et al., 2017), it may not require the physical presence of others. Experimental research supports this notion and suggests that engaging in a prosocial act is positively associated with feelings of relatedness even when one has no direct contact with the task's beneficiary (Martela & Ryan, 2016). In the current study, we seek to extend these findings within a naturalistic context via the experience sampling method (Hektner et al., 2007) among a sample of older adults by assessing whether engaging with one's primary prosocial activity, when alone, promotes greater feelings of relatedness in comparison to other solitary activities.

To summarize, the present study investigates whether pursuing prosocial activity in solitude predicts higher levels of well-being compared to pursuing non-prosocial activities when alone (e.g., leisure, routine activities). We include a sense of relatedness, a eudaimonic facet of well-being not typically captured in affective operationalizations, as an indicator of well-being (e.g., Huta & Waterman, 2014; Ryff & Keyes, 1995; Ryff & Singer, 2008) in addition to positive and negative affect (e.g., Diener, 1984; Diener et al., 1999). Examining whether prosocial activity moderates one's experience of well-being in solitude will enable a deeper understanding of the role of prosociality in solitary contexts and shed light on avenues for older adults to maintain a sense of well-being when there are constraints on opportunities for interactions with others.

Research Design and Methods

Participants

Data were collected as part of a larger project investigating the daily lives of exemplary older adults who either hold leadership positions in prosocial programs or invest high numbers of hours toward formal volunteering (at least five hours per week). Participants were 165 older adults aged between 60 and 88 years (M_{age}=71.13, SD=5.70, 58% female, $n_{response}$=5501) who, on average, devoted 24.6 hours per week toward prosocial work. Table 1 presents sample descriptives.

[Insert Table 1 about here]

Procedure

The experience sampling method (ESM; Hektner et al., 2007) was used to collect data. Participants were signaled at six random times each day for seven days and asked to fill out experience sampling forms to assess their current context and momentary experience. We also

administered a one-time survey to collect demographics and baseline measures. From the original sample of 203 individuals who began the study, 188 completed it (92.6%). Further, 23 participants were excluded because they had less than 20 valid responses (i.e., responses within 30 minutes of each signal). The final dataset consisted of 5501 responses across 165 individuals, with a response rate of 75.2% and study completion rate of 81.3%. The current study was approved as exempt via Claremont Graduate University's Institutional Review Board (Protocol #2946).

Measures

Activity Type

When signaled, participants categorized the main activity they were doing into one of nine categories (e.g., active leisure, socializing, prosocial-program activity, etc.). Prior to data collection, participants identified their major prosocial commitment as their prosocial program. For times when the main activity was associated with this commitment, participants classified it as prosocial-program activity. We created a dichotomous variable denoting activity type to represent the main activity (0=*non-program activity*, 1=*prosocial-program activity*).

Social Context

Participants indicated who they were interacting with each time they were signaled (e.g., nobody, partner, program coworker, etc.). We created a dichotomous variable indicating whether participants' current social context was solitary or not (0=*not alone*, 1=*alone*).

Positive and Negative Affect

Participants indicated the extent to which they felt excited, calm, and proud (positive affect), and stressed, bored, and discouraged (negative affect) at the moment they were signaled on a 7-point Likert scale (1=*not at all*, 7=*extremely*). Within and between-person internal

consistencies (Shrout & Lane, 2012) were .49 and .98 for positive affect, and .58 and .97 for negative affect. Reliability coefficients were comparable to those reported in previous ESM studies (e.g., Chui et al., 2014).

Sense of Relatedness

On a 7-point Likert scale (1=*not at all*, 7=*extremely*), participants reported the extent to which they felt caring, cooperative, and connected to others at the time they were signaled. Within and between-person internal consistencies were .79 and .99. Table 2 presents the descriptive statistics of positive affect, negative affect, and the sense of relatedness.

Covariates

Multiple person-level variables were used as covariates, including age, gender, subjective health, education, and marital status. Additionally, we included a grouping binary covariate to account for any effects that may arise from differences between participants' roles in their primary prosocial-program (i.e., whether they hold leadership positions in their prosocial-program or not). Finally, we also included retrospective one-time measures of participants' average positive affect (excited, calm, and proud), negative affect (stressed, bored, discouraged), and sense of relatedness (caring, cooperative, connected to others) experienced over the week before the study began.

Analysis Plan

We employed multilevel modeling in SPSS version 26. For each outcome variable, we tested a multilevel model that included the activity type, social context, their interaction term, and all person-level covariates as predictors. To further probe the interactions, we used Preacher et al.'s (2006) simple slope analysis tool. Response-level variables were centered on the individual's mean and person-level variables were centered on the sample mean.

[Insert Table 2 about here]

Results

On average, participants spent 49.2% of their time in solitude, and 26.7% of their time engaged in their prosocial-program activity. The percentages of reports classified as solitary prosocial-program, solitary non-program, non-solitary prosocial-program, and non-solitary non-program activity were 12.0%, 37.3%, 15.7%, and 35.0%, respectively.

[Insert Figure 1 about here]

Positive Affect

Activity type, social context, and their interaction term explained 4.2% of variance in positive affect, above and beyond the variance explained by other covariates, including baseline positive affect. The effect of participants' social context on their positive affect was not moderated by activity type (b=.06, p=.223, 95% CI [-0.04, 0.17]; see Figure 1). Simple slope analysis revealed that positive affect was significantly greater in prosocial-program activity relative to other activities both when alone (b=0.31, p<.001, 95% CI [0.23, 0.39]) and when with others (b=0.24, p<.001, 95% CI [0.17, 0.32]). Table S1 presents regression coefficients for all multilevel analyses.

Negative Affect

The effect of social context (i.e., with others or alone) on negative affect was moderated by the type of activity (i.e., non-program or prosocial-program activity) one was involved in (b=-0.17, p=.001, 95% CI [-0.28, -0.07]; see Figure 1). The main effects of these two predictors along with their interaction, however, only explained 0.4% additional variance in negative affect, above and beyond the variance explained by other covariates, including baseline negative affect. Furthermore, simple slope analysis revealed that levels of negative affect were not significantly

different in solitary prosocial-program activity compared to other solitary activities (*b*=-0.01, p=.862, 95% CI [-0.09, 0.07]); however, it was greater in prosocial-program activity (compared to other activities) when interacting with others (*b*=0.17, p<.001, 95% CI [0.09, 0.24]).

Sense of Relatedness

The effect of social context on sense of relatedness was moderated by activity type (*b*=0.40, *p*<.001, 95% CI [0.28, 0.53]; see Figure 1). Activity type, social context, and their interaction term explained 29.3% of the variance in sense of relatedness, above and beyond the variance explained by other covariates, including baseline sense of relatedness. Simple slope analysis revealed that when alone, relatedness was significantly greater in prosocial-program activity compared to other activities (*b*=0.81, *p*<.001, 95% CI [0.72, 0.91]). When with others, sense of relatedness was significantly higher in prosocial-program activity as well (*b*=0.41, *p*<.001, 95% CI [0.32, 0.50]), albeit to a lesser extent relative to the difference between solitary conditions.

Discussion and Implications

On the one hand, being alone can foster loneliness which is associated with a plethora of negative outcomes (Pinquart & Sorensen, 2001; Shankar et al., 2011; Steptoe et al., 2013). On the other, prosocial activities such as volunteering, which can be pursued alone, have been linked to psychological and physical benefits in daily life (Han et al., 2018; 2020). Our study furthers previous research by investigating whether the type of activity one is involved in when alone moderates their momentary well-being. Specifically, we highlight the beneficial effects of prosocial activity on solitary experience. Positive affect was greater during prosocial-program activity both when alone and when with others whereas negative affect was only greater during prosocial-program activity when it occurred in the presence of others. Most importantly, older

adults experienced greater feelings of relatedness when involved in prosocial-program activity during solitude compared to other solitary activities.

Although data collection for the current study preceded the COVID-19 pandemic, the study's findings have timely implications for older adults who are at greater risk of experiencing loneliness given current social distancing guidelines (Campbell, 2020; Macdonald & Hülür, 2020). Although some recent research posits that loneliness among older adults increased only during the initial phase of the pandemic (late March) and levelled off by the time shelter-in-place orders were employed in most of the U.S. (late April; Luchetti et al., 2020), unexpected increases in the expected length of the pandemic (Lin, 2020) may alter the course of perceived loneliness as the pandemic progresses. Furthermore, as research specifically related to COVID-19 and older adults accumulates (e.g., Crimmins, 2020) and becomes public knowledge, an increased awareness of COVID-19 risk factors may motivate some older adults to adopt even more stringent physical distancing measures in the future with the unintended consequence of exacerbating loneliness. In general, loneliness and constraints on social interactions imposed by COVID-19 mitigation measures are some of the most frequently reported challenges among older adults (Heid et al., 2020; Whitehead & Torossian, 2020) and thus, initiatives to remedy these challenges must be undertaken immediately.

While many young adults are able to maintain social relationships through digital communication platforms, older adults do not connect through this medium as easily (Seifert et al., 2020). More developmentally appropriate solutions are needed as we navigate the pandemic. Capitalizing on generative concerns through solitary prosocial activity may be more aligned with the relational needs of older adults. With volunteer matching programs now including virtual positions (e.g., volunteermatch.org and pointsoflight.org), remote volunteer positions are rising

and offer ripe opportunities for older adults to feel connected to others even when alone. Additionally, developments in the domain of remote volunteering need not be limited to the duration of the pandemic, as such opportunities may continue to benefit older adults long after the pandemic is over. Whereas some may find they prefer to volunteer remotely, others with functional limitations may find it more prudent to engage in prosocial activity from their homes. Nevertheless, during the current COVID-19 pandemic when interactions with others may be a greater health risk than loneliness, prosocial programs that have the ability to offer remote positions are encouraged to emphasize the realistic possibility of solitary volunteering. Consequently, older adults can engage in prosocial work from the safety of their homes at least until more immediate, face-to-face interactions are deemed safe.

In terms of methodology, our study expands upon previous empirical work allowing for a more in-depth understanding of how solitary experience is impacted by the type of activity one is pursuing. In general, as some studies have previously suggested (e.g., Chui et al., 2014; Klumb, 2004), interacting with others is a more pleasant experience with lower negative affect and higher positive affect. Using ESM, the current study was able to go beyond differences strictly between social contexts and further assess variation in emotional experience across activities as well. For instance, differences in negative affect between moments when one is involved in prosocial activity versus other activities is only observable when interacting with others, but not when alone. On the contrary, prosocial activity was associated with higher levels of positive affect in both solitary and non-solitary conditions, highlighting the implications of prosocial activity on positive emotions in both types of social contexts. Furthermore, similar to recent studies capturing daily experiences (e.g., Lam & García-Román, 2020), the use of ESM allowed participants to self-report whether instances of a given activity type occurred in solitude or with

others, as opposed to the research team preemptively defining certain activities as solitary and others as interactive (e.g., Menec, 2003).

Our study complements previous research that primarily used negative affect as an indicator of negative solitude and, in turn, loneliness (e.g., Lay et al., 2019; Matias et al., 2011), by directly measuring momentary feelings of relatedness as well. Given that feelings of relatedness during solitude are greater when one is engaged in prosocial activity, prosocial work has the potential to attenuate feelings of loneliness–a major risk factor for mental and physical illness in later life (Pinquart & Sorensen, 2001). Consistent with previous research (Long et al., 2003; Ngyuen et al., 2018), our findings stress the importance of the type of activity one engages in for one's solitary experience, especially when the solitary activity in question is prosocial in nature (Martela & Ryan, 2016).

Limitations

Complementary to its strengths, our study has two noteworthy limitations. First, generalizability of the current findings is limited because the average amount of time participants spent in prosocial activity (24.64 hours per week) was much higher than the national average (1.81 hours per week among those aged 65 and above; Bureau of Labor Statistics, 2016). However, exemplar research does offer the opportunity to investigate the upper extremes of a phenomenon, which in turn may help achieve greater understanding by accounting for processes that may not be observable at normative levels (Matsuba et al., 2013). Future research is encouraged to replicate our study with populations who demonstrate normative levels of prosocial commitment in their daily lives.

Second, our study did not inspect whether specific tasks nested within prosocial activity account for differences in levels of well-being. Some tasks may offer opportunities to realize the

impact of one's actions on others even in their absence (e.g., when preparing for a tutoring session), whereas other tasks may be clerical or administrative in nature (e.g., bookkeeping) where task beneficiaries are not particularly salient (Grant et al., 2007). Future research can assess the impact of specific tasks on well-being associated with solitary prosocial activity, especially as it relates to feelings of relatedness.

Conclusion

Results from our study shed light on the possibility of solitary prosociality and the psychological benefits associated with it. Although interacting with others was always associated with higher positive affect irrespective of whether one was involved in prosocial activity or not, feelings of relatedness were promoted when individuals engaged in prosocial work, significantly more so when alone. Levels of negative affect were comparable between prosocial activity in solitude and other solitary activity. The positive effects of engaging in prosocial work may allow older adults to reap emotional benefits and protect themselves against loneliness despite personal or environmental constraints that may limit their interactions with others. Toward this end, prosocial programs that have the capacity to offer remote volunteering positions are encouraged to facilitate this process.

References

Brown, K. M., Hoye, R., & Nicholson, M. (2012). Self-esteem, self-efficacy, and social connectedness as mediators of the relationship between volunteering and well-being. *Journal of Social Service Research*, *38*, 468–483. doi:10.1080/01488376.2012.687706

Bureau of Labor Statistics, U.S. Department of Labor. (2016, February 25). *Volunteers by annual hours of volunteer activities and selected characteristics, September 2015*. www.bls.gov/news.release/volun.t02.htm

Campbell, A. D. (2020). Practical implications of physical distancing, social isolation, and reduced physicality for older adults in response to COVID-19. *Journal of Gerontological Social Work*. Advance online publication. doi: 10.1080/01634372.2020.1772933

Chui, H., Hoppmann, C. A., Gerstorf, D., Walker, R., & Luszcz, M. A. (2014). Social partners and momentary affect in the oldest-old: The presence of others benefits affect depending on who we are and who we are with. *Developmental Psychology*, *50*, 728–740. doi:10.1037/a0033896

Coyle, C. E., & Dugan, E. (2012). Social isolation, loneliness and health among older adults. *Journal of Aging and Health*, *24*, 1346–1363. doi:10.1177/0898264312460275

Crimmins, E. M. (2020). Age-related vulnerability to coronavirus disease 2019 (COVID-19): Biological, contextual, and policy-related factors. *Public Policy & Aging Report*, *30*, 142–146. doi:10.1093/ppar/praa023

Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*, 542–575. doi:10.1037/0033-2909.95.3.542

Diener, E., Suh, E., Lucas, R., & Smith, H. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*, 276–302. doi:10.1037/0033-2909.125.2.276

Grant, A. M., Campbell, E. M., Chen, G., Cottone, K., Lapedis, D., & Lee, K. (2007). Impact and the art of motivation maintenance: The effects of contact with beneficiaries on persistence behavior. *Organizational Behavior and Human Decision Processes, 103*, 53–67. doi:10.1016/j.obhdp.2006.05.004

Han, S. H., Kim, K., & Burr, J. A. (2018). Stress-buffering effects of volunteering on salivary cortisol: Results from a daily diary study. *Social Science & Medicine*, *201*, 120–126. doi:10.1016/j.socscimed.2018.02.011

Han, S. H., Kim, K., & Burr, J. A. (2020). Stress-buffering effects of volunteering on daily well-being: Evidence from the National Study of Daily Experiences. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *75*, 1731–1740. doi:10.1093/geronb/gbz052

Haslam, C., Cruwys, T., Haslam, S. A., & Jetten, J. (2017). Social connectedness and health. In N. A. Pachana (Ed.) *Encyclopedia of geropsychology* (pp. 2174–2182). Springer. doi:10.1007/978-981-287-082-7_46

Heid, A. R., Cartwright, F., Wilson-Genderson, M., & Pruchno, R. (2020). Challenges experienced by older people during the initial months of the COVID-19 Pandemic. *The Gerontologist*. Advance online publication. doi:10.1093/geront/gnaa138

Hektner, J., Schmidt, J., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life*. Sage. doi: 10.4135/9781412984201

Huta, V., & Waterman, A. S. (2014). Eudaimonia and its distinction from hedonia: Developing a classification and terminology for understanding conceptual and operational definitions. *Journal of Happiness Studies*, *15*, 1425–1456. doi:10.1007/s10902-013-9485-0

Klumb, P. L. (2004). Benefits from productive and consumptive activities: Results from the Berlin Aging Study. *Social Indicators Research 67*, 107–127. doi:10.1023/B:SOCI.0000007336.64239.a6

Krendl, A. C., & Perry, B. L. (2020). The impact of sheltering-in-place during the COVID-19 pandemic on older adults' social and mental well-being. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*. Advance online publication. doi:10.1093/geronb/gbaa110

Lam, J., & García-Román, J. (2020). Solitary day, solitary activities, and associations with well-being among older adults. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *75*, 1585–1596. doi:10.1093/geronb/gbz036

Larson, R. (1990). The solitary side of life: An examination of the time people spend alone from childhood to old age. *Developmental Review*, *10*, 155–183. doi:10.1016/0273-2297(90)90008-R

Larson, R., Csikszentmihalyi, M., and Graef, R. (1982). Time alone in daily experience: Loneliness or renewal? In L. A. Peplau & D. Perlman (Eds.), *Loneliness: A sourcebook of current theory, research, and therapy* (pp. 40–53). Wiley.

Larson, R., Zuzanek, J., & Mannell, R. (1985). Being alone versus being with people: Disengagement in the daily experience of older adults. *Journal of Gerontology*, *40*, 375–381. doi:10.1093/geronj/40.3.375

Lay, J. C., Pauly, T., Graf, P., Biesanz, J. C., & Hoppmann, C. A. (2019). By myself and liking it? Predictors of distinct types of solitude experiences in daily life. *Journal of Personality*, *87*, 633–647. doi:10.1111/jopy.12421

Lay, J. C., Pauly, T., Graf, P., Mahmood, A., & Hoppmann, C. A. (2020). Choosing solitude: Age differences in situational and affective correlates of solitude-seeking in midlife and older adulthood. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *75*, 483–493. doi:10.1093/geronb/gby044

Lin, R. -G., II. (2020, October 29). *'Normal' unlikely to come before 2022 as COVID-19 surges unchecked, Fauci says*. Los Angeles Times. https://www.latimes.com/california/story/2020-10-29/normal-unlikely-before-2022-covid-19-surge-fauci

Long, C. R., & Averill, J. R. (2003). Solitude: An exploration of benefits of being alone. *Journal for the Theory of Social Behaviour*, *33*, 21–44. doi:10.1111/1468-5914.00204

Long, C. R., Seburn, M., Averill, J. R., & More, T. A. (2003). Solitude experiences: Varieties, settings, and individual differences. *Personality and Social Psychology Bulletin*, *29*, 578–583. doi:10.1177/0146167203029005003

Luchetti, M., Lee, J. H., Aschwanden, D., Sesker, A., Strickhouser, J. E., Terracciano, A., & Sutin, A. R. (2020). The trajectory of loneliness in response to COVID-19. *American Psychologist*, *75*, 897–908. doi:10.1037/amp0000690

Luo, Y., Hawkley, L. C., Waite, L. J., & Cacioppo, J. T. (2012). Loneliness, health, and mortality in old age: A national longitudinal study. *Social Science & Medicine*, *74*, 907–914. doi:10.1016/j.socscimed.2011.11.028

Macdonald, B., & Hülür, G. (2020). Well-being and loneliness in Swiss older adults during the COVID-19 pandemic: The role of social relationships. *The Gerontologist*. Advance online publication. doi:10.1093/geront/gnaa194

Martela, F., & Ryan, R. M. (2016). Prosocial behavior increases well-being and vitality even without contact with the beneficiary: Causal and behavioral evidence. *Motivation and Emotion*, *40*, 351–357. doi:10.1007/s11031-016-9552-z

Matias, G. P., Nicolson, N. A., & Freire, T. (2011). Solitude and cortisol: Associations with state and trait affect in daily life. *Biological Psychology*, *86*, 314–319. doi:10.1016/j.biopsycho.2010.12.011

Matsuba, M. K., King, P. E., & Bronk, K. C. (Eds.). (2013). *Exemplar methods and research: Strategies for investigation*. New Directions for Child and Adolescent Development, No. 142. Jossey-Bass.

Menec, V. H. (2003). The relation between everyday activities and successful aging: A 6-year longitudinal study. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *58*, S74–S82. doi:10.1093/geronb/58.2

Morrow-Howell, N. (2010). Volunteering in later life: Research frontiers. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 65*, 461–469. doi:10.1093/geronb/gbq024

Morrow-Howell, N., Hinterlong, J., Rozario, P. A., & Tang, F. (2003). Effects of volunteering on the well-being of older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *58*, S137–S145. doi:10.1093/geronb/58.3.s137

Nakamura, J., Tse, D. C. K., & Mann, A. S. (2020). *High-intensity prosociality in action: An experience sampling study of older prosocial exemplars.* Manuscript in preparation.

Nguyen, T. V. T., Ryan, R. M., & Deci, E. L. (2018). Solitude as an approach to affective self-regulation. *Personality and Social Psychology Bulletin*, *44*, 92–106. doi:10.1177/0146167217733073

Pauly, T., Lay, J. C., Nater, U. M., Scott, S. B., & Hoppmann, C. A. (2017). How we experience being alone: Age differences in affective and biological correlates of momentary solitude. *Gerontology*, *63*, 55–66. doi:10.1159/000450608

Pilkington, P. D., Windsor, T. D., & Crisp, D. A. (2012). Volunteering and subjective well-being in midlife and older adults: The role of supportive social networks. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *67*, 249–260. doi:10.1093/geronb/gbr154

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

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interaction effects in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, *31*, 437–448. doi:10.3102/10769986031004437

Rowe, J. W., & Kahn, R. L. (1997). Successful aging. *The Gerontologist*, *37*, 433–440. doi:10.1093/geront/37.4.433

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68–78. doi: 10.1037110003-066X.55.1.68

Ryan, R. M., Ryan, W. S., Stefano, I. D. D., & Deci, E. L. (2019). The nature and the conditions of human autonomy and flourishing: Self-determination theory and basic psychological needs. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 89–110). Oxford University Press. doi: 10.1093/oxfordhb/9780190666453.013.6

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*, 719–727. doi:10.1037/0022-3514.69.4.719

Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies*, *9*, 13–39. doi:10.1007/s10902-006-9019-0

Segel-Karpas, D., & Ayalon, L. (2020). Loneliness and hostility in older adults: A cross-lagged model. *Psychology and Aging*, *35*, 169–176. doi:10.1037/pag0000417

Seifert, A., Cotten, S. R., & Xie, B. (2020). A double burden of exclusion? Digital and social exclusion of older adults in times of COVID-19. *The Journals of Gerontology, Series B*: *Psychological Sciences and Social Sciences*. Advance online publication. doi:10.1093/geronb/gbaa098

Shankar, A., McMunn, A., Banks, J., & Steptoe, A. (2011). Loneliness, social isolation, and behavioral and biological health indicators in older adults. *Health Psychology*, *30*, 377–385. doi:10.1037/a0022826

Shrout, P. E., & Lane, S. P. (2012). Psychometrics. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 302–320). Guilford.

Son, J., & Wilson, J. (2012). Volunteer work and hedonic, eudemonic, and social well-being. *Sociological Forum*, *27*, 658–681. doi:10.1111/j.1573-7861.2012.01340.x

Steptoe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences*, *110*, 5797–5801.

Vozikaki, M., Linardakis, M., Micheli, K., & Philalithis, A. (2017). Activity participation and well-being among European adults aged 65 years and older. *Social Indicators Research*, *131*, 769–795. doi: 10.1007/s11205-016-1256-y

Warburton, J., Paynter, J., & Petriwskyj, A. (2007). Volunteering as a productive aging activity: Incentives and barriers to volunteering by Australian seniors. *Journal of Applied Gerontology*, *26*, 333–354. doi:10.1177/0733464807304568

Whitehead, B. R., & Torossian, E. (2020). Older adults' experience of the COVID-19 pandemic: A mixed-methods analysis of stresses and joys. *The Gerontologist*. Advance online publication. doi:10.1093/geront/gnaa126

Table 1

Means and Standard Deviations of Key Variables.

Variable	*M (SD) / %*
Person-level variables	
Age	71.13 (5.70)
Gender (male)	42.07%
Ethnicity (Caucasian)	82.32%
Marital status (currently married)	57.06%
Group (volunteers)	49.09%
Education [1–7]	5.52 (1.02)
Subjective health [1–5]	3.86 (0.85)
Baseline positive affect [1–5]	3.37 (0.73)
Baseline negative affect [1–5]	1.88 (0.69)
Baseline sense of relatedness [1-5]	4.08 (0.58)
Response-level variables	
Activity type (prosocial-program activity)	26.68%
Social context (solitary)	49.17%

Note. N=165. Gender: 0=*female*, 1=*male*. Marital status: 0=*not currently married*, 1=*currently married*. Group: 0=*prosocial leaders*, 1=*high-commitment volunteers*. Education: 1=*less than high school*, 7=*professional degree*. Subjective health: 1=*poor*, 5=*excellent*. Baseline positive/negative affect: 1=*very slightly or not at all*, 5=*extremely*. Activity type: 0=*non-program activity*, 1=*prosocial-program activity*. Social context: 0=*not alone*, 1=*alone*.

Table 2

Means, Standard Deviations, Intraclass Correlations, and Within- and Between-Person Correlations of Outcome Variables.

Variable	M	SD_W	SD_B	ICC	1	2	3
Positive affect	3.97	0.82	0.98	.58	—	-.14	.68***
Negative affect	1.98	0.83	0.69	.41	-.42***	—	-.08
Sense of relatedness	4.34	1.16	1.01	.43	.47***	-.19***	—

Note. ICC=intraclass correlation. SD_W=within-person standard deviation. SD_B=between-person standard deviation. Within- and between-person correlations are below and above the diagonal, respectively.
* $p < .05$. ** $p < .01$. *** $p < .001$.