Reviewer's report

Title: Interventions targeting social isolation in older people: a systematic review

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Reviewer: John T Cacioppo

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The authors report a narrative literature review of 33 intervention studies designed to reduce loneliness and social isolation in older adults. Loneliness and social isolation are related but separable constructs, and the outcomes included in the review are also related but separable. The authors conclude that there is "substantial heterogeneity in the interventions delivered" (p. 2) and that "More, well-conducted studies of the effectiveness of social interventions for alleviating social isolation are needed" (p. 3).

The authors noted that a recent quantitative meta-analysis of more than 50 intervention studies designed to reduce loneliness "was published after the date of our literature search" (p. 6). As the senior author of that meta-analysis, I am keenly interested in reviews of this sort and strongly support their inherent importance. I would take exception to several statements made about our meta-analysis, based on statistical evidence we presented in our quantitative literature review.

First, it is true that we did not restrict our review of intervention studies to participants over 50 years of age, but we statistically examined whether age was a moderator and found the effect sizes for the intervention were comparable for older and younger adults.

Second, the authors state that our meta-analysis was "inappropriate for meta-analysis of data, given the heterogeneity regarding the participants (e.g., school children, homeless youths, older people) and the interventions (e.g., online chat rooms, physical exercise, social activities and support groups) studied" (p. 6). I realize that the appearance of our quantitative review of the literature may be somewhat problematic for them, their attempt to denigrate our paper is unnecessary and misguided. The authors assert this, whereas we statistically examined the heterogeneity of the effect sizes based on these features (and many others). Although this is not the place for a full explication of our methodology or findings, suffice it to say that we identified the sources of heterogeneity in the studies, and evaluated the effect sizes of various kinds of interventions across variables (e.g., age) that were not found to be related to intervention effect sizes. In short, I do not believe their characterizations can withstand an evidentiary debate given the statistical analyses and evidence we presented.

Having said this, I would support publication of this review if the authors were to
make appropriate revisions to their literature review. To what extent is the “substantial heterogeneity in the interventions delivered” attributable to the diverse targets (loneliness social isolation) and diverse outcomes (loneliness, depression, health) that were studied? Heterogeneity due to these factors speaks more to decisions made by the authors than it does to possible problems in the literature. Moreover, a heterogeneity of operationalizations does not mean there is a heterogeneity of effects. In our own literature review, we found diverse protocols had been used. We developed a conceptual taxonomy of interventions, and we were able to reliably classify all of the intervention studies into one of these four conceptual types of interventions for loneliness. In our meta-analysis of the randomized clinical trials, we did find type of intervention to account for the heterogeneity in results that were found, and for the results to be homogeneous once this moderating factor was included in the analysis.

Which speaks to the final issue the authors might rethink. They state that “Due to the heterogeneity of both the interventions studies and the data extracted, quantitative synthesis of the data using meta-analytical technique was deemed inappropriate” (p. 10). Although there are instances in which this can be true, the simplest solution here is to not include such conceptually diverse antecedents and outcomes in the literature review. I know the intervention literature on loneliness and the statistics of meta-analysis well. This literature, whether covered across age or limited to participants over 50, meet the statistical requirements for meaningful quantitative analyses and synthesis.

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I have no competing interests other than having published recently on this topic.