

## Supplementary Materials

### Posthoc Analyses

As our exposures (contact frequency with friends and with family) and our mediators (cognitive and physical activity) were measured concurrently, it may be the case that activity engagement increases social engagement and in turn, cognitive functioning. Therefore, in order to address the directionality of these associations, we re-ran our initial model with activity engagement as our exposures and contact frequency as our mediators for both episodic memory and executive functioning. Importantly, no significant indirect effect of cognitive or physical activity engagement through contact frequency emerged ( $ps > .06$ ).

An additional sensitivity analysis testing an alternative scoring for overall physical activity was conducted to assess the robustness of our findings. Specifically, prior research using the physical activity variables in MIDUS (Robinson & Lachman, 2018) calculated overall physical activity by taking the highest score of either moderate or vigorous physical activity. This alternative coding strategy did not alter our pattern of results.

As personality characteristics may be related to both social engagement with friends as well as activity engagement, we conducted a sensitivity analysis in which we additionally controlled for personality characteristics. Consistent with prior research (James, Wilson, Barnes, & Bennett, 2011), we controlled for extraversion and neuroticism (Lachman & Weaver, 1997) on our exposure, mediator and outcome variables. Importantly, the inclusion of these additional covariates did not alter our pattern of findings.

In our main analytic model, full information maximum likelihood was used to handle missing data and utilize the full sample size ( $n = 3,707$ ). Not all participants, however, received a second follow-up cognitive assessment and therefore, a sensitivity analysis was conducted using listwise deletion as an alternative approach to handling missing data. Importantly, the pattern of

findings was consistent across both executive functioning (sample size using listwise deletion:  $n = 2,275$ ) and episodic memory (sample size using listwise deletion:  $n = 2,267$ ) models.

Finally, as our exposure and mediator variables are self-reported, it may be the case that those who show episodic memory impairment at baseline may not be able to accurately self-report their contact with friends and family or their engagement in cognitive and/or physical activities. Therefore, we conducted a sensitivity analyses in which we implemented an additional exclusion criterion for participants who scored 2 standard deviations below the mean on the episodic memory score at baseline ( $n = 30$ ). The exclusion of these participants did not alter our pattern of findings.