Testing for age moderation of heritability of loneliness across adulthood

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Feelings of loneliness (i.e. negative emotions associated with perceived unsatisfied social needs) are linked to a variety of important outcomes, including physical health, emotional well-being, cognitive decline and Alzheimer's disease, and mortality (L.C. Hawkley and J.T. Cacioppo, 2010, Ann. Beh. Med., 40, 218–227). Twin studies of loneliness have yielded moderate heritability estimates for younger samples with wide age ranges, and emerging evidence suggests estimates may vary by age (T. Waakatar & S. Torgersen, 2012, Am J Med Genet Part B, 580–588). The age moderation of heritability in mid to late adulthood remains virtually unexplored.

The present study evaluated the age moderation of heritability of loneliness in 8120 twin pairs (3193 MZ, 4927 DZ; age range 25–102 years, 53 % female) from 10 studies participating in IGEMS. Loneliness was measured with a single ordinal item from either the CES-D or CAMDEX depression scales, which were harmonized based on IRT analysis of an independent sample taking both measures. ACE biometrical model fitting to the harmonized loneliness item compared five age groups (\50, 50–59, 60–69, 70–79, and [80 years) adjusted for sex, country, and age within each age group. The full model yielded modest heritability estimates (A) ranging from 19 to 33 %, and common environmentality estimates (C) of 0–6 % for the\50, 50–59, and 60–69 age groups. No additive genetic influences were observed for the two oldest age groups and C was estimated at 13–18 %. Although cohort differences cannot be ruled out, loss of spouse and friends becomes more common at older ages and may impact similarity in reports of loneliness among twin siblings regardless of zygosity. Despite these patterns, ACE estimates could be constrained across age groups, resulting in overall estimates of 21 % A, 6 % C, and the remaining 74 % due to non-shared environment.