

## GENDER DIFFERENCES IN LONELINESS

<b>Citation</b>	Maes, M., Qualter, P., Vanhalst, J., Van den Noortgate, W., & Goossens, L. (2019). Gender differences in loneliness across the lifespan: A meta-analysis. <i>European Journal of Personality</i> , 33, 642-654. doi:10.1002/per.2220
<b>Archived version</b>	Author manuscript: the content is identical to the content of the published paper, but without the final typesetting by the publisher
<b>Published version</b>	<a href="https://doi.org/10.1002/per.2220">doi:10.1002/per.2220</a>
<b>Author contact</b>	<a href="http://www.marliesmaes.com">www.marliesmaes.com</a>

*(article begins on next page)*

## GENDER DIFFERENCES IN LONELINESS

### **Abstract**

Different theoretical contentions on gender differences in loneliness exist, often including the emergence of gender differences in particular developmental periods. To explain those ideas, the current meta-analysis synthesizes the available evidence on gender differences in loneliness across the lifespan. Three-level meta-analyses were conducted with 751 effect sizes, covering 399,798 individuals (45.56% males). Results showed a close-to-zero overall effect ( $g = 0.07$ ). Most examined moderators were non-significant, except for age, the scope of the sampling area, and year of publication. Most importantly, all effects were small, suggesting that across the lifespan mean levels of loneliness are similar for males and females.

*Keywords:* loneliness, gender differences, lifespan, meta-analysis

### **Gender Differences in Loneliness Across the Lifespan: A Meta-Analysis**

Loneliness is defined as the unpleasant feeling that occurs when people perceive their network of social relationships to be deficient in quantitative or qualitative ways (Perlman & Peplau, 1981). According to the evolutionary theory of loneliness (J. T. Cacioppo et al., 2015), the social pain of loneliness serves as a warning system that (1) signals to people that something is missing in their social relationships and (2) motivates them to reconnect to significant others. However, for some individuals, this reconnection may fail, detrimentally affecting their mental and physical well-being. For example, research has shown that people scoring high on loneliness have more psychological problems, such as depression and anxiety, more physical health problems, such as sleep problems and cardiovascular incidents, become ill more quickly, and pass away at an earlier age (see for reviews Ernst & Cacioppo, 1999; Goossens et al., 2015; Hawkey & Capitanio, 2015; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). These detrimental effects have mainly been studied in adults, but the poor mental and physical health effects of loneliness have been found in children and adolescents as well (Doane & Thurston, 2014; Harris, Qualter, & Robinson, 2013; Heinrich & Gullone, 2006; Qualter et al., 2013). Hence, it is important to examine loneliness across the lifespan.

The mounting evidence for direct links to poor health and well-being that has emerged over the last decade has led both researchers and policy makers to pay increasing attention to loneliness and explore individual differences that make certain people vulnerable to feelings of loneliness. Loneliness certainly has some trait-like features, which are as personality (Mund, Freuding, Möbius, Horn, & Neyer, 2019), but a frequently asked question is whether gender represents a vulnerability factor for loneliness. Results on that issue have been largely inconsistent, and no consensus has been reached. Hence, our main question in this meta-analysis is whether there are gender differences in loneliness, and whether that pattern is the same across the course of human life.

## GENDER DIFFERENCES IN LONELINESS

### **Gender Differences in Loneliness**

Gender differences in loneliness have most often been examined without a clear a priori theoretical hypothesis. Some theoretical notions have been proposed, which generally focus on a particular developmental period. Moreover, the same research findings have been used to build different lines of reasoning, leading to opposing hypotheses on gender differences in loneliness. Below, we review that scattered literature, showing the hypotheses that have most often been put forward.

Several studies have found that males are lonelier than females, but only rarely has a hypothesis in this regard been presented. One example of such an hypothesis states that males will be lonelier than females from adolescence onwards (Koenig & Abrams, 1999). That hypothesis has been explained by arguing that although both male and female adolescents spend less time with their family than children, males show a steeper decline in family time than females. Combined with the fact that, unlike females where time spent with family is replaced with time spent with peers, males spend increasing time alone. This line of reasoning has led to the assumption that loneliness is higher among male adolescents than female adolescents. However, higher levels of aloneness (i.e., the objective state of being alone) do not necessarily lead to higher levels of loneliness (Larson, 1990). Loneliness arises when there is a discrepancy between one's actual and desired social relationships, and the objective state of being alone does not tell much about that discrepancy.

Other studies have found that females are lonelier than males. The theoretical notion that has been put forward the most in this regard, hypothesizes that gender differences in loneliness emerge in adolescence. This hypothesis is derived from theoretical models of internalizing problems, and is based on the assumption that loneliness can be categorized as an internalizing problem (Creemers, Scholte, Engels, Prinstein, & Wiers, 2012; Romero & Epkins, 2008; Vanhalst et al., 2012). The sexual selection evolutionary theory has been used

## GENDER DIFFERENCES IN LONELINESS

to explain the common finding that females are more at risk for adolescent-onset internalizing problems (Martel, 2013). That theory suggests that adolescence, and in particular puberty, is a critical period for females, because they become more sensitive to interpersonal aspects of the social environment. In addition, the theory states that females have more negative emotionality and more effortful control than males, with both characteristics being linked to the development of internalizing problems. However, it has also been argued that those higher levels of negative emotionality and effortful control facilitate the development of empathy, interpersonal sensitivity, and manipulation of interpersonal contexts (Martel, 2013). Those skills are likely beneficial in developing the social relationships one wants, and could, therefore, also be regarded as protective factors for loneliness.

Another theoretical notion that has been put forward in the literature focuses on the elderly and hypothesizes that it is during this transitional period of old age that females will be lonelier than males. For instance, in a study exploring gender differences in psychological well-being in old age (Pinquart & Sörensen, 2001), it was argued that females are more vulnerable to loneliness because they tend to live longer and are, therefore, more likely to be widowed, to struggle with functional limitations (e.g., restricted mobility), and to require more health care. However, it has also been argued that divorce and widowhood in this period of life would have a stronger impact on the social life of males than females because males tend to focus on their partner as their main confidant and most of their friendships have been dissolved by this age (Cooney & Dunne, 2001). In other words, whereas females might still have close friendships after divorce or widowhood to fulfill their social needs, this might be less the case for males, leading to increased feelings of loneliness.

To summarize, very few a priori hypotheses on gender differences in loneliness have been proposed in the literature. The theoretical notions that have been proposed tend to focus on particular developmental periods and a lifespan perspective is lacking. Most importantly,

## GENDER DIFFERENCES IN LONELINESS

the theoretical notions lack conviction as the same evidence base can be used to develop an opposing line of reasoning. This lack of conviction in theoretical notions corresponds with the inconsistency of empirical findings, which often reflect no gender differences in loneliness or only small differences with some suggesting that females are lonelier and others that males are lonelier. Hence, it might very well be that there actually are no gender differences in loneliness across the lifespan.

### **Moderation of Gender Differences in Loneliness**

The existence and size of gender differences in loneliness may depend on several factors.

**Age.** As detailed before, the age range or developmental period in which a study is conducted could influence whether gender differences are found. More specifically, gender differences have been hypothesized to emerge during the transition periods of adolescence and old age. However, loneliness research with a lifespan focus is rare, and it is yet unclear whether gender differences that are thought to emerge in adolescence remain stable or become smaller or larger across adulthood.

**Loneliness types.** Gender differences may also vary according to the type of loneliness that is examined. Three types of loneliness have been distinguished in the literature, integrating different previous categorizations of types of loneliness. These types are referred to as intimate, relational, and collective loneliness (S. Cacioppo, Grippo, London, Goossens, & Cacioppo, 2015). Intimate – or emotional – loneliness is the feeling of lacking a close, intimate attachment to another person. That perceived absence of a significant other may refer to different relationships across the lifespan, including a parent, best friend, or a romantic partner. Relational – or social – loneliness is the feeling of lacking a network of social relationships, and may refer to different networks, including a family, a group of friends, or classroom peers. Collective loneliness refers to experienced discrepancies in one's valued social identities and connections with similar others. Those similar others are not necessarily

## GENDER DIFFERENCES IN LONELINESS

known and constitute broader groups, such as one's school, neighborhood, or cultural group. Because females orient more toward dyadic, intimate attachments (Baumeister & Sommer, 1997; Gardner & Gabriel, 2004), they might experience less intimate loneliness than males (Hoza, Bukowski, & Beery, 2000). However, one could also argue that precisely because females value dyadic relationships, they are especially vulnerable in this regard and may experience more intimate loneliness than males. Opposing hypotheses can also be proposed regarding relational loneliness. On the one hand, males might experience less relational loneliness because they orient more toward the group. On the other hand, males may be more vulnerable to relational loneliness because groups are more important for them (Maes, Vanhalst, Van den Noortgate, & Goossens, 2017). Collective loneliness has received far less attention in the literature and no hypotheses on gender differences in this type of loneliness have been advanced as of yet.

**Relationship-specific types of loneliness.** Gender differences may vary according to the specific relationship (i.e., with peers, family, or a romantic partner) in which loneliness is experienced. Females might experience less loneliness in relation to the family because they tend to live in a more protected family environment with greater family support than males (Musetti, Corsano, Majorano, & Mancini, 2012). However, it could also be argued that because the family context is more important for females, they have higher expectations that are more difficult to meet, making them more vulnerable for loneliness (Maes, Klimstra, Van den Noortgate, & Goossens, 2015). Opposing hypotheses can also be proposed for gender differences in loneliness regarding relationships with peers or a romantic partner (Kuttler & La Greca, 2004; Maes et al., 2015; Musetti et al., 2012; Zimmer-Gembeck, 2002). It could be argued that females invest more in, and expect more from, their peers and a romantic partner than males. Those higher expectations might not be met, and females might experience more loneliness in those relationships than males. However, it could also be argued that this higher

## GENDER DIFFERENCES IN LONELINESS

investment leads to higher perceived support, which would result in lower levels of loneliness. Only a few studies examined gender differences in relationship-specific types of loneliness, with results pointing in different directions (e.g., Corsano, Majorano, & Champretavy, 2006; DiTommaso & Spinner, 1993; Maes et al., 2015; Musetti et al., 2012; Qualter, Quinton, Wagner, & Brown, 2009).

**Additional study and sample characteristics.** Other study and sample characteristics that might affect gender differences in loneliness include the country in which the study was conducted, the socioeconomic, ethnic and clinical background of the participants, the geographical representation within the sample, and the year in which the study was published. We examined those additional study and sample characteristics in an explorative fashion.

### **The Present Study**

Gender differences in loneliness have been frequently examined, but theoretical contentions are rare and conflicting, and findings largely inconsistent (Weeks & Asher, 2012). Therefore, we aimed to synthesize the available evidence on gender differences in loneliness across the lifespan. In addition to examining that global effect, we were interested in each of the moderator effects as detailed above. Hence, we investigated the effects of participants' age, types of loneliness, the country in which the study was conducted, the socioeconomic, ethnic, and clinical status of the participants, the geographical representation of the sample, and the year in which the study was published on gender differences in loneliness.

## **Method**

### **Literature Search**

Because it is often not clear from the title or abstract of an article whether or not gender differences in loneliness were examined, we aimed to screen the full-text of all empirical reports that included one of the main standardized loneliness measures. Only standardized loneliness questionnaires were included to minimize bias in outcome assessment.

## GENDER DIFFERENCES IN LONELINESS

These loneliness measures were the Children's Loneliness Scale (CLS; Asher, Hymel, & Renshaw, 1984), the Differential Loneliness Scale (DLS; Schmidt & Sermat, 1983), the Loneliness and Aloneness Scale for Children and Adolescents (LACA; Marcoen, Goossens, & Caes, 1987), the Peer Network and Dyadic Loneliness Scale (PNDLS; Hoza et al., 2000), the Relational Provisions Loneliness Questionnaire (RPLQ; Hayden, 1989), the Rasch-Type Loneliness Scale (RTL5; De Jong Gierveld & Kamphuis, 1985), the Social and Emotional Loneliness Scale for Adults (SELSA; DiTommaso & Spinner, 1993), and the University of California Los Angeles Loneliness Scale (UCLA Loneliness Scale; Russell, Peplau, & Cutrona, 1980). We conducted the literature search in the following databases: PsychInfo, ERIC, PubMed, and Web of Science, using key terms that reflected the names of the loneliness measures. For example, for the UCLA loneliness Scale, we used the search strings ("UCLA Loneliness Scale" or "UCLA Loneliness Questionnaire") and ((UCLA) and (lonel\* or "perceived social isola\*")). A full list of key terms can be found at the Open Science Framework (<https://osf.io/tzg32/>). Only empirical journal reports, books, and book chapters were included. This search resulted in 3,594 reports. In addition, we located studies through reports that were obtained in this search and by contacting experts in the field for relevant reports. In this way, we obtained an additional 64 reports. This literature search was completed in August 2014, and the resulting database was labeled as Meta-Analytic Study of Loneliness (MASLO).

### **Selection of Studies**

The resulting 3,658 reports in the MASLO database were screened (for a flow diagram of the selection process, see Figure 1). Of those reports, 1,376 reports were dropped from the database because they did not use one of the standardized loneliness measures, but only referred to it, for example, in the Introduction. In addition, 206 reports were excluded because they were written in a language other than Dutch, English, French, or German. Finally, we

## GENDER DIFFERENCES IN LONELINESS

could not retrieve the full-text version of 3 reports. The remaining 2,073 reports were read in depth, after which 248 reports were excluded. Excluded reports included methodologies where a loneliness measure had been administered, but no numeric information for the measure, such as descriptives or univariate statistical tests, was provided.

Of the remaining 1,825 reports, 526 reports described gender differences in loneliness in 582 studies (i.e., some reports included multiple studies on multiple datasets). Only unadjusted effect sizes were included (e.g., gender effects examined in multiple regression analyses were not included). Some of the included studies yielded information on multiple effects because they included multiple questionnaires or multiple subscales within a multidimensional questionnaire, resulting in a total of 682 effects. When gender differences were assessed at multiple time points within the same longitudinal study, data were taken from the first measurement wave. In June 2016, we conducted an update of our procedure, yielding data on an additional 153 effects from 121 reports. A second coder checked 10% of the reports included in the MASLO database and coded whether or not gender differences were reported. An 98% agreement rate was achieved and disagreements were resolved by discussion.

Next, we scrutinized all references for duplicates because the same sample of participants is sometimes used in multiple studies. We found 56 such reports and dropped them from the database. We selected the reports that had the most complete data (to calculate effects sizes or code for moderators) and/or the largest sample size. When the available information was equally complete and the samples were equally large, we included the report that had been published first. The resulting 591 reports yielded 770 effects. For 544 of those effects, sufficient statistical information was reported to calculate an effect size and corresponding standard error. For the other 226 effects, information on gender differences was provided, but insufficient statistics were reported to calculate an effect size and/or the

## GENDER DIFFERENCES IN LONELINESS

corresponding standard error. For 207 of those 226 effects, we still could calculate an effect size when making assumptions that we will describe in more detail below (see Effect Size Calculations). The final dataset included 751 effect sizes from 638 studies in 575 reports. A reference list of all included reports can be found in the Supplementary Materials.

### Study Coding

A manual was developed to guide the coding of studies. An extensive training was provided to the undergraduate and graduate students in psychology who coded the reports. In addition, the first author checked the reports coded by the students to verify that the rules as described in the manual had been applied. The present dataset included 751 effect sizes ( $k$ ) from 638 studies ( $n$ ) in 575 reports published between 1978 and 2016. Sample sizes varied from 10 to 26,116 participants. A total of 399,798 individuals were included in the present meta-analysis, 45.56% of whom were male. Participants' mean age, as reported in 495 studies, ranged from 5 to 90 years (Mean = 27.92 years) with a mean standard deviation, as reported in 378 studies, of 4.00 years. Study and sample characteristics together with the effect sizes for each included study can be found in the Supplementary Materials.

**Age.** To examine whether gender differences in loneliness change across developmental periods, we coded for age group. If the age range for a sample spanned more than one category, we chose the category corresponding to the mean age. Studies ( $n = 589$ ) were coded according to the following five age categories: (1) children, that is, participants who were, on average, younger than 12 years or who were in Grade 6 or lower ( $n = 109$ ); (2) adolescents, that is, participants who were between 12 and 21 years old ( $n = 267$ ); (3) young adults, that is, participants who were older than 21 years, but younger than 40 years ( $n = 97$ ); (4) middle age adults, that is, participants who were between 40 and 65 years old ( $n = 44$ ); and (5) elderly, that is, participants who were 65 years or older ( $n = 72$ ).

## GENDER DIFFERENCES IN LONELINESS

**Loneliness type.** To examine whether gender differences vary according to loneliness type, we coded whether the loneliness measures used in the studies reflect (1) intimate, (2) relational, or (3) collective loneliness. Not all measures could be coded because some measures, such as the popular UCLA Loneliness Scale, tap into both intimate and relational loneliness. In all, we could code 334 effect sizes ( $k$ , 44.47%), reflecting intimate loneliness ( $k = 65$ ), relational loneliness ( $k = 267$ ), and collective loneliness ( $k = 2$ ). Because only two effect sizes were available for collective loneliness, we did not include that type of loneliness in the moderator analyses.

**Relationship-specific types of loneliness.** To examine whether gender differences vary according to the specific relationship in which loneliness is experienced, we coded whether the included loneliness scales reflected relationships with (1) peers (including friends and the larger peer group), (2) family (including individual family members and the family as a whole), or (3) a romantic partner. Not all measures could be coded because some scales do not refer to a specific relationship. In all, we could code 310 effect sizes (41.28%), reflecting loneliness in relationships with peers ( $k = 237$ ), family ( $k = 48$ ), and a romantic partner ( $k = 25$ ).

**Individualism.** The studies included in the meta-analysis were conducted in countries from different continents. Most studies (48.90%) sampled from North America, including the USA ( $n = 255$ ) and Canada ( $n = 55$ ). Studies conducted in Europe comprised 23.20% of the present dataset, including the Netherlands ( $n = 31$ ), the UK ( $n = 17$ ), Belgium ( $n = 17$ ), and Germany ( $n = 17$ ). Studies conducted in Asia comprised 21.32% of the present dataset, including China ( $n = 40$ ), Turkey ( $n = 32$ ), and Israel ( $n = 27$ ). Fewer studies were conducted in Oceania (4.70%), including Australia ( $n = 29$ ) and New Zealand ( $n = 1$ ), and in Africa (0.63%), including Zimbabwe ( $n = 2$ ), Nigeria ( $n = 1$ ), and South Africa ( $n = 1$ ). A small subset of studies (1.25%) could not be categorized, because they used mixed samples from

## GENDER DIFFERENCES IN LONELINESS

different continents. Some of those studies included participants from South-America, but none of the studies focused solely on participants from that continent.

For each of the 45 countries represented in the present dataset, we took the individualism score from Hofstede's (2001) model of national culture, a score that ranges from 0 to 100. For two of the countries, that is, Zimbabwe and Cuba, no such scores were available, so studies conducted in these countries were not included in the moderator analysis. In all, we could code individualism scores for 621 studies (97.34%). Individualism scores in the present dataset ranged from 14 to 91 ( $M = 72.43$ ,  $SD = 24.45$ ).

**Socioeconomic status.** Information regarding the socioeconomic status (SES) of the participants was coded. For many studies, this information was not provided ( $n = 379$ ; 59.40%). The other studies provided different sources of information, including income, level of education, or percentages of free lunch. Those studies comprised (1) low SES samples, with 75% or more of the participants being of low SES ( $n = 36$ ); (2) middle or high SES samples, with 75% or more of the participants being of middle or high SES ( $n = 82$ ); and (3) mixed SES samples, with neither low nor middle or high SES categories making up more than 75% of the sample ( $n = 141$ ).

**Ethnic majority/minority status.** Information regarding the ethnic majority or minority status of the participants was coded. For many studies, this information was not provided ( $n = 354$ ; 55.49%). The other studies were classified as follows: (1) more than 75% of the participants came from an ethnic minority group ( $n = 28$ ); (2) more than 75% of the participants came from an ethnic majority group ( $n = 163$ ); and (3) the sample was of mixed ethnic majority/minority status with neither of the categories including more than 75% ( $n = 93$ ).

**Clinical groups.** To examine whether gender differences varied according to clinical status, we coded whether studies included participants with a physical disability or illness,

## GENDER DIFFERENCES IN LONELINESS

special educational needs, or mental health problems. We categorized all studies as follows: (1) non-clinical ( $n = 560$ ), (2) clinical ( $n = 51$ ), or (3) mixed, that is, studies that looked at both non-clinical and clinical groups ( $n = 27$ ).

**Sampling area.** To examine whether gender differences in loneliness varied according to the geographical representation of the sample, we coded the studies as follows: (1) participants were sampled in a single city ( $n = 349$ ), (2) participants were sampled in multiple cities within one geographical area ( $n = 121$ ), and (3) participants were sampled in multiple geographical areas ( $n = 105$ ). The remaining 63 studies (9.87%) could not be coded due to missing information.

**Publication year.** To facilitate interpretation of the estimates, we recoded the values in such a way that the report with the oldest year of publication (i.e., 1978) represented zero.

### Effect Size Calculations

As effect size, we used Hedges'  $g$ , which is similar to Cohen's  $d$  (Rosenthal & DiMatteo, 2001). We calculated  $g$  by subtracting the loneliness mean of females from that of males and dividing the resulting scores by the pooled standard deviation (Lipsey & Wilson, 2001). A positive effect size, therefore, reflects a higher loneliness mean for males than females. For all effect sizes, we applied Hedges' small-sample correction (Lipsey & Wilson, 2001). The effect sizes were weighted by the inverse variance (Lipsey & Wilson, 2001), such that samples with higher precision got a greater weight in the analyses. We interpreted effect sizes based on Cohen's (1988) benchmarks, as suggested by Hyde (2005). So, we interpreted effect sizes as follows: close-to-zero ( $g \leq 0.10$ ), small ( $0.11 \leq g \leq 0.35$ ), moderate ( $0.36 \leq g \leq 0.65$ ), large ( $0.66 \leq g \leq 1.00$ ), or very large ( $g > 1.00$ ).

When descriptive statistics (i.e., means and standard deviations) and sample sizes were provided for males and females separately, we used that information to calculate  $g$  and the corresponding standard error. When studies did not provide that information, but provided

## GENDER DIFFERENCES IN LONELINESS

inferential statistics such as an  $F$ ,  $t$ , or  $r$  value, we used the formulae presented in Lipsey and Wilson (2001) to derive  $g$  and its standard error. Using those conversions, we were able to calculate 540 effect sizes, assuming a common population standard deviation. By making additional assumptions, we were able to calculate an extra 207 effect sizes. For example, if only a total sample size was reported, we assumed an equal sample size for males and females; if the authors reported that no significant gender differences were found, without reporting exact information about the effect size or  $p$ -value, we assumed an effect size of zero. To assess the sensitivity of our conclusions for the assumptions we made, we performed the meta-analyses with and without the effect sizes for which we had to make assumptions.

### **Statistical Analyses**

Because several reports reported on multiple studies and multiple effect sizes, we conducted a multilevel meta-analysis. A multilevel meta-analysis does not make the strong assumption of independence that underlies traditional meta-analytic approaches, but explicitly accounts for possible dependencies among effect sizes (Hox, 2002; Van den Noortgate, López-López, Marín-Martínez, & Sánchez-Meca, 2013). Specifically, we specified a three-level model. At the first level, there is random sampling variance (which can be very well approximated using the formula presented in Lipsey & Wilson, 2001, and therefore is assumed to be known in the meta-analysis). At the second level, there is within-study variance, reflecting systematic variance between effect sizes within the same study. At the third level, we considered two sources of random variation, that is, between-study variance (reflecting systematic variance between studies) and between-instrument variance (reflecting systematic variance between the different instruments, that is, scales or – if available – subscales, that have been used to assess loneliness). Because the random effects of studies and instruments are not nested but rather crossed (in one study, multiple instruments can be used,

## GENDER DIFFERENCES IN LONELINESS

and vice versa, the same instrument may be used in multiple studies), this is a cross-classified three-level model (Goldstein, 2003).

To examine whether gender differences varied according to study and sample characteristics, we conducted moderation analyses by including the characteristics as predictors in the three-level cross-classified model. Analyses were conducted with the Metafor package (Version 1.9-9) in R using restricted maximum likelihood (REML) as estimation method (Assink & Wibbelink, 2016; Viechtbauer, 2010). Overall mean and category-specific mean effects were statistically tested by means of a Wald test, comparing the ratio of the estimate over the corresponding standard error estimate to a  $t$ -distribution. Moderator effects were tested using Type III  $F$ -tests. Variance components were tested using a likelihood ratio test, comparing the difference in deviance score of a model including all variance components with a restricted model to a  $\chi^2$ -distribution. At the Open Science Framework, both the dataset (<https://osf.io/tqmeh/>) and analysis scripts (<https://osf.io/37u8s/>) are available.

### Results

#### Gender Differences in Loneliness

The 751 observed effect sizes are presented in Figure 2, ordered as a function of increasing support for greater loneliness in males. The 95% confidence intervals that indicate the precision of each study are also included. This figure, commonly referred to as a caterpillar plot, graphically illustrates that most effect sizes were close to zero. To combine the effect sizes, we conducted three analyses. First, when focusing only on the 544 effects for which sufficient information was available to calculate a standardized mean difference, we found a close-to-zero mean effect of  $g = 0.08$  ( $SE = 0.03$ , 95% CI [0.02, 0.13]). Although the size of the overall effect is small, it is statistically significant at the .05 significance level,  $p = .005$ , suggesting that males are slightly lonelier than females. Second, when the analysis was

## GENDER DIFFERENCES IN LONELINESS

based on all 751 effects and, thus, also included the effects for which we had to make assumptions (see ‘Effect Size Calculations’ above), we obtained a similar effect of  $g = 0.07$  ( $SE = 0.02$ ,  $p = .003$ , and 95% CI [0.03, 0.12]). Third, as an analysis that is more robust against publication bias, we focused on the effect sizes derived from the larger samples with a minimum of 100 male and 100 female participants. This analysis, based on 376 effects, yielded a non-significant mean effect size of  $g = 0.04$  ( $SE = 0.02$ ,  $p = .078$  and 95% CI [-0.01, 0.09]).

We also examined how the total variance in observed effect sizes was decomposed into sampling variance, within-study, between-study, and between-instrument variance (for the model including all 751 effects). Because there is no single value for the sampling variance (the variance depends on the size of the study), we used the median sampling variance for this calculation. The within-study variance (0.014,  $\chi^2(1) = 86.90$ ,  $p < .001$ ) represented 27.56% of the total variance. The between-study variance (0.012,  $\chi^2(1) = 15.67$ ,  $p < .001$ ) and the between-instrument variance (0.008,  $\chi^2(1) = 17.64$ ,  $p < .001$ ) represented 23.29% and 15.46% of the total variance, respectively. This means that, on top of the sampling variance, there is systematic variance between effect sizes within studies, between studies, and between measurement instruments.

### **Moderation of Gender Differences in Loneliness**

Most moderators (Table 1) did not significantly predict gender differences in loneliness. Moderators that were not significant were the type of loneliness that was experienced, the relationship in which loneliness was experienced, and the socioeconomic, ethnic minority/majority, and clinical status of the sample. Three of the moderators were significant, that is, age group, sampling area, and year of publication.

First, age group significantly moderated gender differences in loneliness. We found non-significant mean effect sizes for middle age adults and elderly, and small but significant

## GENDER DIFFERENCES IN LONELINESS

mean effect sizes for children, adolescents, and young adults, suggesting that males were somewhat lonelier than females in those groups. Second, sampling area was found to be a significant moderator, with the largest mean effect size for studies that sampled from a single city. When participants were sampled from multiple cities within a single area or across different geographical areas, the mean estimated effect sizes were no longer significant. Third, gender differences in loneliness tended to become smaller in more recently published reports. Those three moderators together explained 11.76% of the systematic variance. However, when the three moderators were entered together in the same model, the moderating effect of year of publication was no longer significant ( $p = .415$ ).

### **Publication Bias**

The mean effect size slightly decreased when we excluded studies with small sample sizes, suggesting that there might be publication bias as well. Therefore, we examined the presence of publication bias in two additional ways. First, to obtain a rough indication of publication bias, we created a funnel plot (Figure 3) for those studies with sufficient statistical information to compute an effect size ( $k = 544$ ) and for the total dataset including the studies for which we had to make additional assumptions ( $k = 751$ ). In the absence of publication bias, we would expect the plots to be shaped as a funnel, suggesting that as sample size increases, studies converge more closely around the true mean. The two plots, which were highly similar, effectively showed more or less a funnel shape. To test statistically for publication bias, we applied an extension of Egger's regression test by adding the sampling variance as a moderator to the model ( $k = 751$ ). That moderator did not reach significance,  $F(1, 749) = 0.91, p = .342$ . Hence, publication bias was unlikely to have had a substantial influence on our findings.

## **Discussion**

## GENDER DIFFERENCES IN LONELINESS

The present meta-analysis examined gender differences in loneliness across the lifespan. Overall, we found a small but significant effect suggesting that males are slightly lonelier than females. When focusing on only those samples with at least 100 males and 100 females, the effect was not significant. Gender differences varied according to the age of the participants, the scope of the sampling area, and the year of publication. No significant effects were found for the other moderators, that is, types of loneliness, country-level individualism, and the socioeconomic, ethnic, and clinical status of the participants.

### **Gender Differences in Loneliness Across the Lifespan**

Previous theoretical and empirical work suggested that gender differences might be limited to certain age groups only. It has, for example, been argued that males would be lonelier than females from adolescence onwards because males tend to replace the time they spent with their family with time spent alone during this developmental period, whereas females replace that family time with time spent with peers (Koenig & Abrams, 1999). Based on that line of reasoning, one would expect no gender differences in loneliness during childhood and higher levels of loneliness in males than females from adolescence onwards. That expected trend is not supported by the present results: we did not find that gender differences in loneliness changed from childhood to adolescence. Spending time alone does not tell much about the quantity or quality of one's relationships and even less about whether or not there is a discrepancy between the actual and desired levels, the definition of loneliness. In other words, even if males spend less time with other people, that only leads to loneliness when they wish their situation was different. Similarly, even if females spend more time with others, feelings of loneliness will only stay away when that time spent with others helps to fulfill their social needs.

Another hypothesis that has frequently been mentioned in the literature suggests that females become lonelier than males from adolescence onwards, as females are more at risk

## GENDER DIFFERENCES IN LONELINESS

for adolescent-onset internalizing problems (Martel, 2013). Again, our results do not suggest that gender differences in loneliness change from childhood to adolescence. Moreover, if any gender difference in loneliness exists, our results suggest somewhat higher levels for males than females. Nevertheless, it is striking that gender differences tend to vary among internalizing problems. Two internalizing problems that are strongly related to loneliness are depression and social anxiety, with some researchers even suggesting that loneliness, depression, and social anxiety are actually reflections of a single underlying factor (Danneel, Bijttebier et al., 2019; Fung, Paterson, & Alden, 2017). However, whereas there seems to be consensus that females experience more depressive symptoms than males from adolescence onwards, our findings show this is not the case for loneliness. For social anxiety, less evidence is available, but findings seem to be more in line with work on depression, with females experiencing more social anxiety symptoms than males from adolescence onwards (Danneel, Nelemans et al., 2019). The present findings, thus, supports previous work on the distinctiveness of loneliness, depressive symptoms, and social anxiety symptoms (Danneel, Bijttebier et al., 2019; Fung et al., 2017), but it remains unclear why this variation in gender differences across internalizing problems occurs. Furthermore, it is in line with work examining the mean-level development of loneliness, showing that loneliness follows a unique pattern that is different from other internalizing problems, such as depression (Mund et al., 2019).

It has also been suggested that gender differences in loneliness will become apparent during old age, with the opposing hypotheses of higher levels of loneliness in males (Cooney & Dunne, 2001) or females (Pinquart & Sörensen, 2001). However, our results do not suggest that gender differences in loneliness appear during old age: we found that males were slightly lonelier than females in childhood, adolescence, and young adulthood, but those small gender differences disappeared in middle adulthood and old age.

## GENDER DIFFERENCES IN LONELINESS

Our findings suggest that the largest gender differences were found for young adults (i.e., aged between 21 and 40 years). A recent study, based on a large nationally representative German sample of adults, found a peak in loneliness for that age group (Luhmann & Hawkley, 2016). That study also examined which predictors of loneliness were specific for which age group. For young adults, they found three age-specific predictors of loneliness, that is, income, having a full-time job, and relationship status. According to the age-normative perspective, individuals are less lonely when they meet their age-normative expectations. Young adulthood is the period in life when making and saving money, building a career, and finding a partner and starting a family are more important life goals than in other periods in life (Luhmann & Hawkley, 2016). Moreover, previous research showed that economic success was more important for males than females (Eccles, 2007; Pinquart & Sörensen, 2000). So, not meeting the norm of making money and building a career might lead to loneliness among young adults, and these effects might be stronger for males. This is in line with previous work finding that income and life satisfaction were most strongly related in young adulthood (Cheung & Lucas, 2015). Regarding the third predictor, that is, relationship status, it is not yet clear whether this would be a more important life goal for males or females in this period of life. However, we should be rather cautious with our conclusions because the gender difference found for young adults was significant, but also rather small ( $g = 0.12$ ). An effect of  $g = 0.12$  means that average loneliness scores of males and females differ from each other by 0.12 of a standard deviation. This effect is in line with previous meta-analyses on gender differences in several psychological variables, which consistently found rather small effects (with some exceptions, including some motor behaviors and some aspects of sexuality; Hyde, 2005). A lack of gender differences in loneliness is also in line with recent work showing that loneliness was rather stable across time and that the strength of this stability did not vary between males and females (Mund et al., 2019).

### **Gender Differences in Loneliness Across Different Contexts**

In addition to age category, we examined whether gender differences in loneliness would vary according to the different types of loneliness (i.e., intimate and relational loneliness). Opposing hypotheses have been proposed in this regard. It has been argued that females orient more toward dyadic attachments and males orient more toward the group (Baumeister & Sommer, 1997; Gardner & Gabriel, 2004). Females might, therefore, invest more in dyadic relationships (and males more in group relationships) and, as a result, females would experience less intimate loneliness than males (and males would experience less relational loneliness than females; Hoza et al., 2000). In contrast, one could also argue that precisely because females and males value a particular type of relationship they are especially vulnerable to experience loneliness in that regard (Maes et al., 2017). The present results showed that gender differences did not vary according to the type of loneliness examined. Those findings underline the notion of loneliness as a negative feeling that arises when people perceive a discrepancy between their actual and desired social relationships. In other words, loneliness is not just about expectations of relationships or about social needs, nor just about the number of relationships or the quality of those relationships – loneliness is about an experienced imbalance between what one has and what one wants.

Similar opposing hypotheses have been proposed concerning gender differences in loneliness as experienced in different relationship contexts (i.e., peers, family, or a romantic partner). For example, females tend to live in a more protected family environment with greater family support than males (Musetti et al., 2012) and might, therefore, experience less loneliness in their family relationships. However, as with the different types of loneliness described above, it could also be argued that precisely because of the importance of the family context, females are especially vulnerable in this regard and might experience more family-related loneliness than males (Maes et al., 2015). Our results suggest that gender differences

## GENDER DIFFERENCES IN LONELINESS

do not vary according to the relationship context in which loneliness is experienced. That finding is also in line with previous research, showing that even though males and females tend to focus on and value different types of relationships, they are equally social and take comparable care in how they relate to others (Baumeister & Sommer, 1997; Gardner & Gabriel, 2004; Rose & Rudolph, 2006).

The other moderators, that is, the degree of individualism of the country from which the participants were sampled, the socioeconomic, ethnic minority/majority, and clinical status of the participants, the geographical representation of the sample, and the year in which the study was published, were examined in an explorative fashion. Gender differences varied according to the geographical representation of the sample. We found the largest gender differences in loneliness for studies that sampled from a single city. However, gender differences disappeared for studies that sampled from multiple cities within a single geographical area and across multiple geographical areas. It might be that studies that sampled participants from just a single city yield less representative results, leading to random error, than studies that sampled from multiple cities and/or geographical areas.

We also found a small effect of publication year, suggesting that more recent studies show smaller gender differences in loneliness. Gender roles have changed over time (Sweeting, Bhaskar, Benzeval, Popham, & Hunt, 2014), which might have affected social needs, expectations, and relationships of males and females. However, gender roles also differ across cultures, and our results do not suggest that gender differences in loneliness varied across cultures. Moreover, the effect of publication year disappeared when the three significant moderators, that is, age, sampling area, and publication year, were examined simultaneously. Those findings are in line with a metasynthesis including over a hundred meta-analyses on gender differences in different psychological domains, suggesting that

## GENDER DIFFERENCES IN LONELINESS

gender differences were rather small in most domains, and largely stable across time and cultures (Mund et al., 2019; Zell, Krizan, & Teeter, 2015).

Furthermore, we examined whether gender differences in loneliness varied according to the socioeconomic, ethnic minority/majority, and clinical status of the participants. Our results suggest that gender differences in loneliness did not vary across those contexts. We should note, however, that the moderator reflecting participants' socioeconomic background is difficult to interpret because it taps into something different in different developmental periods. Nevertheless, loneliness is a universal phenomenon, and the present results suggest that males and females are very similar regarding mean levels of loneliness, across a wide range of different contexts.

### **Recommendations for Future Research**

Reviewing the literature on gender differences in loneliness across the lifespan led us to several suggestions for future research. As a research community, we should aim to base our conclusions on a set of studies that is representative and covers the human population as well as possible. For example, over 75% of the studies in the present meta-analysis were conducted in Western countries, with about half of these from the US. Although research outside the US is increasing, information for some parts of the world, especially Africa and South-America, is largely lacking. Also, more than half of all studies included in the present meta-analysis did not report information about the socioeconomic or ethnic status of the participants. We would like to urge researchers to include information on those demographic characteristics of their sample in their research reports. Of those studies that reported such information, only 14% included samples with mostly participants of low SES and only 10% included samples with mostly participants from an ethnic minority group. Furthermore, 26% of all studies focused on college students, which represents a very specific context that is only experienced by a limited number of people, typically people with higher SES and belonging

## GENDER DIFFERENCES IN LONELINESS

to the majority group (Henrich, Heine, & Norenzayan, 2010). Overall, we strongly suggest researchers report the demographics of the sample, and include populations that are less frequently studied and more difficult to reach, in order to expand our knowledge base and to generalize our findings.

Consideration also needs to be given to providing sufficient statistical information regarding gender differences in future studies. When studies found a non-significant gender difference, but reported insufficient statistics to compute a standardized mean difference, we entered a conservative effect size of zero. An effect size is unlikely to be exactly zero, and it might be that all these effect sizes actually were in a certain direction. However, our results on the subset of studies with sufficient information to calculate an effect size yielded a similar, close-to-zero effect. Nevertheless, we encourage researchers to also report sufficient information for non-significant results.

Further, future research should examine different types of loneliness more systematically. Regarding the third type of loneliness distinguished in the Introduction, that is, collective loneliness, conceptual and empirical work is largely lacking. Distinguishing among different types of loneliness is not only of interest for gender differences, but is important in its own right. For example, previous research on adolescents found that different types of loneliness were related to problems in different domains (e.g., parenting and peer group functioning; Maes, Vanhalst, Spithoven, Van den Noortgate, & Goossens, 2016) and to different forms of psychopathology (Lasgaard, Goossens, Bramsen, Trillingsgaard, & Elklit, 2011).

Finally, to meaningfully compare groups, such as males and females, researchers should first establish measurement invariance, which basically means that the items, as well as the underlying factors, of the measure included are interpreted in the same way by the groups studied (Chen 2007; Van de Schoot et al. 2012). However, measurement invariance

## GENDER DIFFERENCES IN LONELINESS

has rarely been examined in the studies included in the present meta-analysis. Some studies did examine measurement invariance across gender. For the UCLA Loneliness Scale, scalar invariance across gender was established in Belgian adolescents (Maes et al., 2017) and Chinese adolescents (Zhang, Gao, Fokkema, Alterman, & Liu, 2015). For the CLS, scalar invariance was established in US children (Ebesutani et al., 2012) and Belgian adolescents (Maes et al., 2017). For the RTLIS, scalar invariance was established for Belgian adolescents (Maes et al., 2017), for Spanish older adults (Buz & Perez-Arechaederra, 2014), but not for Dutch older adults (Van Baarsen et al., 2001). For the LACA, the PNDLS, and the RPLQ, scalar invariance was established for Belgian adolescents (Maes, Klimstra et al., 2015; Maes et al., 2017). Measurement invariance across gender has, to our knowledge, not yet been tested for the SELSA and DLS. We recommend researchers examine measurement invariance across the groups they wish to compare.

### **Limitations**

First, samples were categorized into five different age groups, representing important developmental periods across life. This categorization was performed based on the mean age of the samples. However, not all samples were age-homogeneous, and some actually contained participants from different age categories. Second, although we searched thoroughly and systematically in various databases, searching additional databases (such as Embase) possibly could have resulted in additional findings. Third, we did not have a second coder for each study. However, several efforts were made to increase coding consistency, that is, we created a detailed coding manual, developed an extensive training for the coders, and checked all reports coded to verify that the rules described in the manual had been applied correctly. Fourth, because studies usually do not specify how they assessed ethnicity, we could not code for it. This means, for example, that we do not know which generations of immigrants were included when authors referred to ‘ethnic minorities’.

## GENDER DIFFERENCES IN LONELINESS

### **Practical Implications**

Overall, we found significant gender differences in loneliness for children, adolescents, and young adults. However, those effects were very small. Thus, researchers, policy makers, and practitioners should not assume males to be more lonely than females and should develop and offer interventions for both. Indeed, when we let our prejudices about gender influence us, it means the group we view as less lonely risks receiving less recognition and treatment by professionals (Borys & Perlman, 1985; Salk, Hyde, & Abramson, 2017). Our results suggest that mean levels of loneliness across the lifespan are similar for males and females, and advertisements of services and interventions should be directed to both. However, this does not mean that we should assume a “one size fits all” intervention. Different types of loneliness may need different intervention strategies.

### **Conclusion**

To conclude, our review into gender differences in loneliness covered 39 years of research, including samples with various socioeconomic, ethnic minority/majority, and clinical status from 45 countries. Overall, we did not find strong evidence for gender differences in loneliness, suggesting that males and females are more alike than they are different on self-reported loneliness.

**References**

- Asher, S. R., Hymel, S., & Renshaw, P. D. (1984). Loneliness in children. *Child Development, 55*, 1456-1464. doi:10.2307/1130015
- Assink, M., & Wibbelink, C. J. (2016). Fitting three-level meta-analytic models in R: A step-by-step tutorial. *Quantitative Methods for Psychology, 12*, 154-174. doi:10.20982/tqmp.12.3.p154
- Baumeister, R. F., & Sommer, K. L. (1997). What do men want? Gender differences and two spheres of belongingness: Comment on Cross and Madson (1997). *Psychological Bulletin, 122*, 38-44. doi:10.1037/0033-2909.122.1.38
- Borys, S., & Perlman, D. (1985). Gender differences in loneliness. *Personality and Social Psychology Bulletin, 11*, 63-74. doi:10.1177/0146167285111006
- Buz, J., & Perez-Arechaederra, D. (2014). Psychometric properties and measurement invariance of the Spanish version of the 11-item De Jong Gierveld Loneliness Scale. *International Psychogeriatrics, 26*, 1553-1564. doi:10.1017/S1041610214000507
- Cacioppo, J. T., Cacioppo, S., Cole, S. W., Capitanio, J. P., Goossens, L., & Boomsma, D. I. (2015). Loneliness across phylogeny and a call for comparative studies and animal models. *Perspectives on Psychological Science, 10*, 202-212. doi:10.1177/1745691614564876
- Cacioppo, S., Grippo, A. J., London, S., Goossens, L., & Cacioppo, J. T. (2015). Loneliness: Clinical import and interventions. *Perspectives on Psychological Science, 10*, 238-249. doi:10.1177/1745691615570616
- Cheung, F., & Lucas, R. E. (2015). When does money matter most? Examining the Association between income and life satisfaction over the life course. *Psychology and Aging, 30*, 120-135. doi:10.1037/a0038682
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*, 464-504. doi:10.1080/10705510701301834
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

## GENDER DIFFERENCES IN LONELINESS

- Cooney, T. M., & Dunne, K. (2001). Intimate relationships in later life: Current realities, future prospects. *Journal of Family Issues*, 22, 838-858.  
doi:10.1177/019251301022007003
- Corsano, P., Majorano, M., & Champretavy, L. (2006). Psychological well-being in adolescence: The contribution of interpersonal relations and experience of being alone. *Adolescence*, 41, 341-353.
- Creemers, D. H., Scholte, R. H., Engels, R. C., Prinstein, M. J., & Wiers, R. W. (2012). Implicit and explicit self-esteem as concurrent predictors of suicidal ideation, depressive symptoms, and loneliness. *Journal of Behavior Therapy and Experimental Psychiatry*, 43, 638-646. doi:10.1016/j.jbtep.2011.09.006
- Danneel, S., Bijttebier, P., Bastin, M., Colpin, H., Van Den Noortgate, W., Van Leeuwen, K., Verschueren, K., & Goossens, L. (2019). Loneliness, social anxiety, and depressive symptoms in adolescence: Examining their distinctiveness through factor analysis. *Journal of Child and Family Studies*, 28, 1326-1336. doi:10.1007/s10826-019-01354-3
- Danneel, S., Nelemans, S., Spithoven, A., Bastin, M., Bijttebier, P., Colpin, H., Van Den Noortgate, W., Van Leeuwen, K., Verschueren, K., & Goossens, L. (2019). Internalizing problems in adolescence: Linking loneliness, social anxiety symptoms, and depressive symptoms over time. *Journal of Abnormal Child Psychology*. Advance online publication. doi:10.1007/s10802-019-00539-0.
- De Jong Gierveld, J., & Kamphuis, F. (1985). The development of a Rasch-Type loneliness scale. *Applied Psychological Measurement*, 9, 289-299.  
doi:10.1177/014662168500900307
- DiTommaso, E., & Spinner, B. (1993). The development and initial validation of the Social and Emotional Loneliness Scale for Adults (SELSA). *Personality and Individual Differences*, 14, 127-134. doi:10.1016/0191-8869(93)90182-3
- Doane, L. D., & Thurston, E. C. (2014). Associations among sleep, daily experiences, and loneliness in adolescence: Evidence of moderating and bidirectional pathways. *Journal of Adolescence*, 37, 145-154. doi:10.1016/j.adolescence.2013.11.009

## GENDER DIFFERENCES IN LONELINESS

- Ebesutani, C., Drescher, C. F., Reise, S. P., Heiden, L., Hight, T. L., Damon, J. D., & Young, J. (2012). The importance of modeling method effects: Resolving the (uni)dimensionality of the Loneliness Questionnaire. *Journal of Personality Assessment, 94*, 186-195. doi:10.1080/00223891.2011.627967
- Eccles, J. S. (2007). Families, schools, and developing achievement-related motivations and engagement. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research* (pp. 665-691). New York, NY: Guilford Press.
- Ernst, J. M., & Cacioppo, J. T. (1999). Lonely hearts: Psychological perspectives on loneliness. *Applied and Preventive Psychology, 8*, 1-22. doi:10.1016/s0962-1849(99)80008-0
- Fung, K., Paterson, D., & Alden, L. E. (2017). Are social anxiety and loneliness best conceptualized as a unitary trait? *Journal of Social and Clinical Psychology, 36*, 335-345. doi:10.1521/jscp.2017.36.4.335
- Gardner, W. L., & Gabriel, S. (2004). Gender differences in relational and collective interdependence: Implications for self-views, social behavior, and subjective well-being. In A. H. Eagly, A. E. Beall, & R. J. Sternberg (Eds.), *The psychology of gender* (2nd ed., pp. 169-191). New York, NY: Guilford Press.
- Goldstein, H. (2003). *Multilevel statistical models* (3rd ed.). London, UK: Arnold.
- Goossens, L., van Roekel, E., Verhagen, M., Cacioppo, J. T., Cacioppo, S., Maes, M., & Boomsma, D. I. (2015). The genetics of loneliness: Linking evolutionary theory to genome-wide genetics, epigenetics, and social science. *Perspectives on Psychological Science, 10*, 213-226. doi:10.1177/1745691614564878
- Harris, R. A., Qualter, P., & Robinson, S. J. (2013). Loneliness trajectories from middle childhood to pre-adolescence: Impact on perceived health and sleep disturbance. *Journal of Adolescence, 36*, 1295-1304. doi:10.1016/j.adolescence.2012.12.009

## GENDER DIFFERENCES IN LONELINESS

- Hawkley, L. C., & Capitano, J. P. (2015). Perceived social isolation, evolutionary fitness and health outcomes: A lifespan approach. *Philosophical Transactions of the Royal Society B*, 370, 20140114. doi:10.1098/rstb.2014.0114
- Hayden, L. K. (1989). *Children's loneliness*. Unpublished doctoral dissertation. University of Waterloo. Waterloo, Ontario, Canada.
- Heinrich, L. A., & Gullone, E. (2006). The clinical significance of loneliness: A literature review. *Clinical Psychology Review*, 26, 695-718. doi:10.1016/j.cpr.2006.04.002
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, 466, 29-29. doi:10.1038/466029a
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.
- Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science*, 10, 227-237. doi:10.1177/1745691614568352
- Hox, J. (2002). *Multilevel analysis: Techniques and applications*. Mahwah, NJ: Erlbaum.
- Hoza, B., Bukowski, W. M., & Beery, S. (2000). Assessing peer network and dyadic loneliness. *Journal of Clinical Child Psychology*, 29, 119-128. doi:10.1207/S15374424jccp2901\_12
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, 60, 581-592. doi:10.1037/0003-066X.60.6.581
- Koenig, L. J., & Abrams, R. F. (1999). Adolescent loneliness and adjustment: A focus on gender differences. In K. J. Rotenberg & S. Hymel (Eds.), *Loneliness in childhood and adolescence* (pp. 296-322). New York, NY: Cambridge University Press.
- Kuttler, A. F., & La Greca, A. M. (2004). Linkages among adolescent girls' romantic relationships, best friendships, and peer networks. *Journal of Adolescence*, 27, 395-414. doi:10.1016/j.adolescence.2004.05.002

## GENDER DIFFERENCES IN LONELINESS

- Larson, R. W. (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
- Lasgaard, M., Goossens, L., Bramsen, R. H., Trillingsgaard, T., & Elklit, A. (2011). Different sources of loneliness are associated with different forms of psychopathology in adolescence. *Journal of Research in Personality, 45*, 233-237.  
doi:10.1016/j.jrp.2010.12.005
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.
- Luhmann, M., & Hawkey, L. C. (2016). Age differences in loneliness from late adolescence to oldest old age. *Developmental Psychology, 52*, 943-959. doi:10.1037/dev0000117
- Maes, M., Klimstra, T., Van den Noortgate, W., & Goossens, L. (2015). Factor structure and measurement invariance of a multidimensional loneliness scale: Comparisons across gender and age. *Journal of Child and Family Studies, 24*, 1829-1837.  
doi:10.1007/s10826-014-9986-4
- Maes, M., Vanhalst, J., Spithoven, A. M., Van den Noortgate, W., & Goossens, L. (2016). Loneliness and attitudes toward aloneness in adolescence: A person-centered approach. *Journal of Youth and Adolescence, 45*, 547-567. doi:10.1007/s10964-015-0354-5
- Maes, M., Vanhalst, J., Van den Noortgate, W., & Goossens, L. (2017). Intimate and relational loneliness in adolescence. *Journal of Child and Family Studies, 26*, 2059-2069. doi:10.1007/s10826-017-0722-8
- Marcoen, A., Goossens, L., & Caes, P. (1987). Loneliness in pre through late adolescence: Exploring the contributions of a multidimensional approach. *Journal of Youth and Adolescence, 16*, 561-577. doi:10.1007/bf02138821
- Martel, M. M. (2013). Sexual selection and sex differences in the prevalence of childhood externalizing and adolescent internalizing disorders. *Psychological Bulletin, 139*, 1221-1259. doi:10.1037/a0032247
- Mund, M., Freuding, M. M., Möbius, K., Horn, N., & Neyer, F. J. (2019). The stability and change of loneliness across the life span: A meta-analysis of longitudinal studies.

## GENDER DIFFERENCES IN LONELINESS

- Personality and Social Psychology Review*. Advance online publication. doi: 10.1177/1088868319850738
- Musetti, A., Corsano, P., Majorano, M., & Mancini, T. (2012). Identity processes and experience of being alone during late adolescence. *International Journal of Psychoanalysis and Education, 1*, 44-65.
- Perlman, D., & Peplau, L. A. (1981). Toward a social psychology of loneliness. In S. Duck & R. Gilmour (Eds.), *Personal relationships in disorder* (Vol. 3, pp. 31-56). London, UK: Academic Press.
- Pinquart, M. & Sörensen, S. (2000). Influences of socioeconomic status, social network, and competence on subjective well-being in later life: A meta-analysis. *Psychology and Aging, 15*, 187-224. doi:10.1037/0882-7974.15.2.187
- Pinquart, M., & Sörensen, S. (2001). Gender differences in self-concept and psychological well-being in old age: A meta-analysis. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 56B*, P195-P213.  
doi:10.1093/geronb/56.4.P195
- Qualter, P., Brown, S. L., Rotenberg, K. J., Vanhalst, J., Harris, R. A., Goossens, L., . . . Munn, P. (2013). Trajectories of loneliness during childhood and adolescence: Predictors and health outcomes. *Journal of Adolescence, 36*, 1283-1293.  
doi:10.1016/j.adolescence.2013.01.005
- Qualter, P., Quinton, S. J., Wagner, H., & Brown, S. (2009). Loneliness, interpersonal distrust, and alexithymia in university students. *Journal of Applied Social Psychology, 39*, 1461-1479. doi:10.1111/j.1559-1816.2009.00491.x
- Qualter, P., Vanhalst, J., Harris, R. A., Van Roekel, E., Lodder, G., Bangee, M., . . . Verhagen, M. (2015). Loneliness across the life span. *Perspectives on Psychological Science, 10*, 250-264. doi:10.1177/1745691615568999
- Romero, L. E., & Epkins, C. C. (2008). Girls' cognitions of hypothetical friends: Are they related to depression, loneliness, social anxiety and perceived similarity? *Journal of Social and Personal Relationships, 25*, 311-332. doi:10.1177/0265407507087961

## GENDER DIFFERENCES IN LONELINESS

- Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, *132*, 98-131. doi:10.1037/0033-2909.132.1.98
- Rosenthal, R., & DiMatteo, M. R. (2001). Meta-analysis: Recent developments in quantitative methods for literature reviews. *Annual Review of Psychology*, *52*, 59-82. doi:10.1146/annurev.psych.52.1.59
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The Revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, *39*, 472-480. doi:10.1037/0022-3514.39.3.472
- Salk, R. H., Hyde, J. S., & Abramson, L. Y. (2017). Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. *Psychological Bulletin*, *143*, 783-822. doi:10.1037/bul0000102
- Schmidt, N., & Sermat, V. (1983). Measuring loneliness in different relationships. *Journal of Personality and Social Psychology*, *44*, 1038-1047. doi:10.1037/0022-3514.44.5.1038
- Sweeting, H., Bhaskar, A., Benzeval, M., Popham, F., & Hunt, K. (2014). Changing gender roles and attitudes and their implications for well-being around the new millennium. *Social Psychiatry and Psychiatric Epidemiology*, *49*, 791-809. doi:10.1007/s00127-013-0730-y
- Van Baarsen, B., Snijders, T. A. B., Smit, J. H., & Van Duijn, M. A. J. (2001). Lonely but not alone: Emotional isolation and social isolation as two distinct dimensions of loneliness in older people. *Educational and Psychological Measurement*, *61*, 119-135. doi:10.1177/00131640121971103
- Van den Noortgate, W., López-López, J. A., Marín-Martínez, F., & Sánchez-Meca, J. (2013). Three-level meta-analysis of dependent effect sizes. *Behavior Research Methods*, *45*, 576-594. doi:10.3758/s13428-012-0261-6
- Van de Schoot, R., Lugtig, P., & Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, *9*, 486-492. doi:10.1080/17405629.2012.686740.

## GENDER DIFFERENCES IN LONELINESS

- Vanhalst, J., Klimstra, T. A., Luyckx, K., Scholte, R. H., Engels, R. C., & Goossens, L. (2012). The interplay of loneliness and depressive symptoms across adolescence: Exploring the role of personality traits. *Journal of Youth and Adolescence, 41*, 776-787. doi:10.1007/s10964-011-9726-7
- Victor, C. R., & Yang, K. (2012). The prevalence of loneliness among adults: A case study of the United Kingdom. *Journal of Psychology: Interdisciplinary and Applied, 146*, 85-104. doi:10.1080/00223980.2011.613875
- Viechtbauer, W. (2010). Conducting meta-analyses in R with the Metafor package. *Journal of Statistical Software, 36*, 1-48. doi:10.18637/jss.v036.i03
- Weeks, M. S., & Asher, S. R. (2012). Loneliness in childhood: Toward the next generation of assessment and research. *Advances in Child Development and Behavior, 42*, 1-39. doi:10.1016/B978-0-12-394388-0.00001-0
- Zhang, B., Gao, Q., Fokkema, M., Alterman, V., & Liu, Q. (2015). Adolescent interpersonal relationships, social support and loneliness in high schools: Mediation effect and gender differences. *Social Science Research, 53*, 104-117. doi:10.1016/j.ssresearch.2015.05.003
- Zell, E., Krizan, Z., & Teeter, S. R. (2015). Evaluating gender similarities and differences using metasynthesis. *American Psychologist, 70*, 10-20. doi:10.1037/a0038208
- Zimmer-Gembeck, M. J. (2002). The development of romantic relationships and adaptations in the system of peer relationships. *Journal of Adolescent Health, 31*, 216-225. doi:10.1016/S1054-139X(02)00504-9

## GENDER DIFFERENCES IN LONELINESS

Table 1

*Separate Regression Analyses for the Moderators Predicting Gender Differences in Loneliness*

Moderator	<i>k</i>	$\beta$	<i>SE</i> $\beta$	95% CI	<i>F</i>	<i>df</i>	<i>p</i>
Age	694				7.70	4, 689	< .001
Children	115	0.08 <sub>b,c</sub>	0.03	0.01, 0.14			.027
Adolescents	307	0.08 <sub>b,c</sub>	0.03	0.03, 0.13			.002
Young adults	134	0.12 <sub>c</sub>	0.03	0.06, 0.18			<.001
Middle age adults	53	0.02 <sub>a,b</sub>	0.03	-0.05, 0.09			.540
Elderly	85	-0.05 <sub>a</sub>	0.03	-0.11, 0.01			.131
Loneliness type	332				1.60	1, 330	.206
Intimate	65	0.04	0.06	-0.08, 0.16			.546
Relational	267	0.13	0.05	0.04, 0.23			.006
Relationship	310				0.14	2, 307	.868
Peers	237	0.05	0.04	-0.04, 0.13			.267
Family	48	0.08	0.07	-0.06, 0.21			.274
Romantic partner	25	0.02	0.09	-0.17, 0.20			.870
Individualism	730	-0.00	0.00	-0.00, 0.00	3.35	1, 728	.068
Socioeconomic status	289				1.07	2, 286	.343
Mostly low SES	40	-0.03	0.05	-0.12, 0.06			.523
Mixed SES	159	0.01	0.04	-0.06, 0.09			.696
Mostly Middle/high SES	90	0.03	0.04	-0.05, 0.11			.462
Ethnic majority/minority	318				2.59	2, 315	.077
Mostly minority	29	0.02	0.05	-0.08, 0.12			.679
Mixed minority/majority	103	0.11	0.04	0.04, 0.18			.002
Mostly majority	186	0.06	0.03	0.00, 0.12			.038

## GENDER DIFFERENCES IN LONELINESS

Clinical status	751					1.05	2, 748	.350
Non-clinical	666	0.08	0.02	0.03, 0.12				.002
Mixed	27	0.04	0.05	-0.06, 0.14				.408
Clinical	58	0.03	0.04	-0.05, 0.11				.469
Sampling area	675					7.67	2, 672	<.001
Single city	405	0.10 <sub>a</sub>	0.03	0.05, 0.15				<.001
Multiple cities, single area	136	0.05 <sub>b</sub>	0.03	-0.00, 0.11				.059
Multiple areas	134	0.02 <sub>b</sub>	0.03	-0.03, 0.07				.478
Publication year	751	-0.00	0.00	-0.00, -0.00		7.50	1, 749	.006

---

*Note.* The regression coefficients for the categorical variables can be interpreted as the mean effect sizes for each category.  $k$  is the number of effect sizes in the category;  $\beta$  = regression coefficient; CI = confidence interval. Effects sizes are significantly different if they do not have the same subscript.

## GENDER DIFFERENCES IN LONELINESS

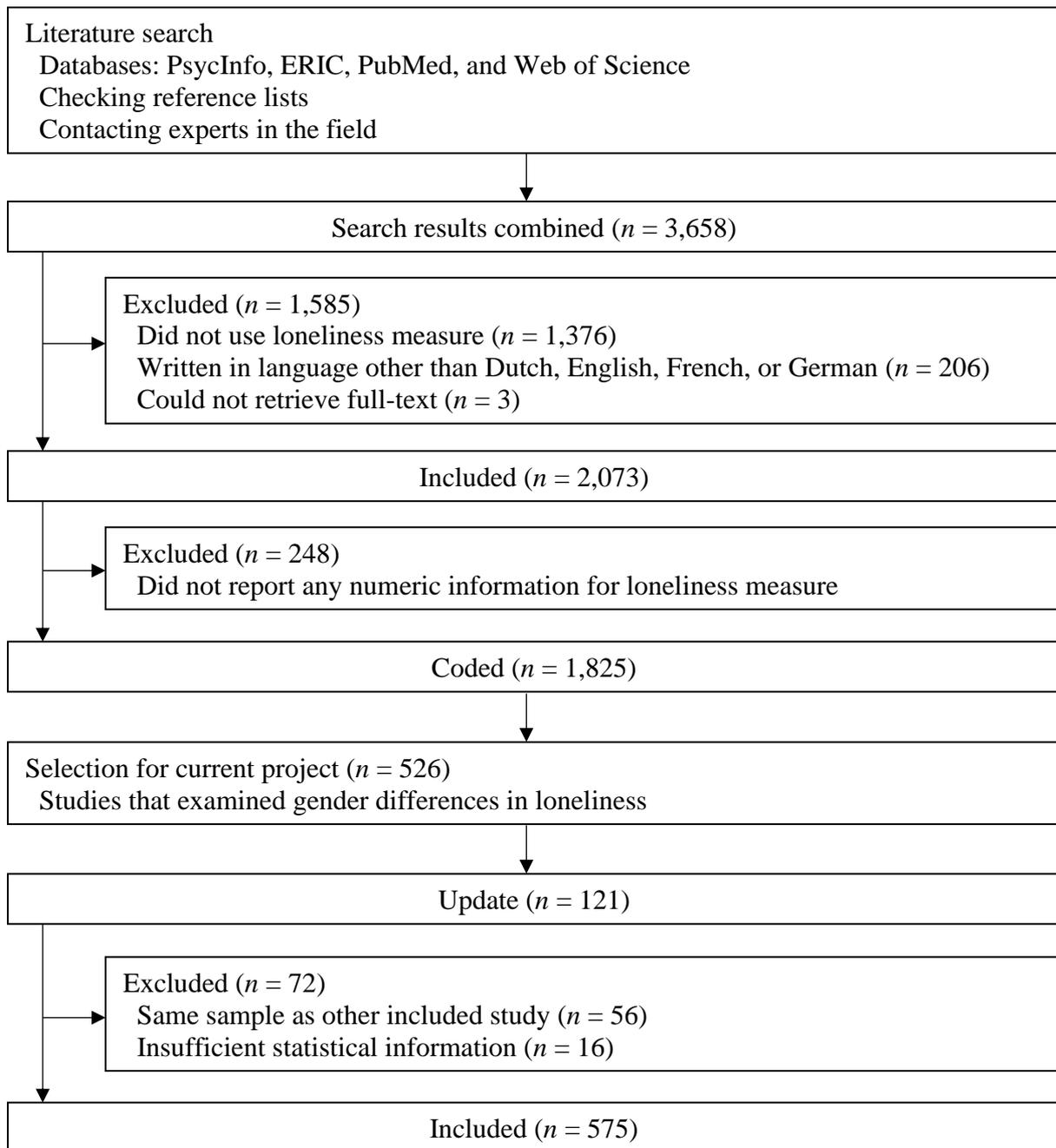


Figure 1. PRISMA flow diagram.

# GENDER DIFFERENCES IN LONELINESS

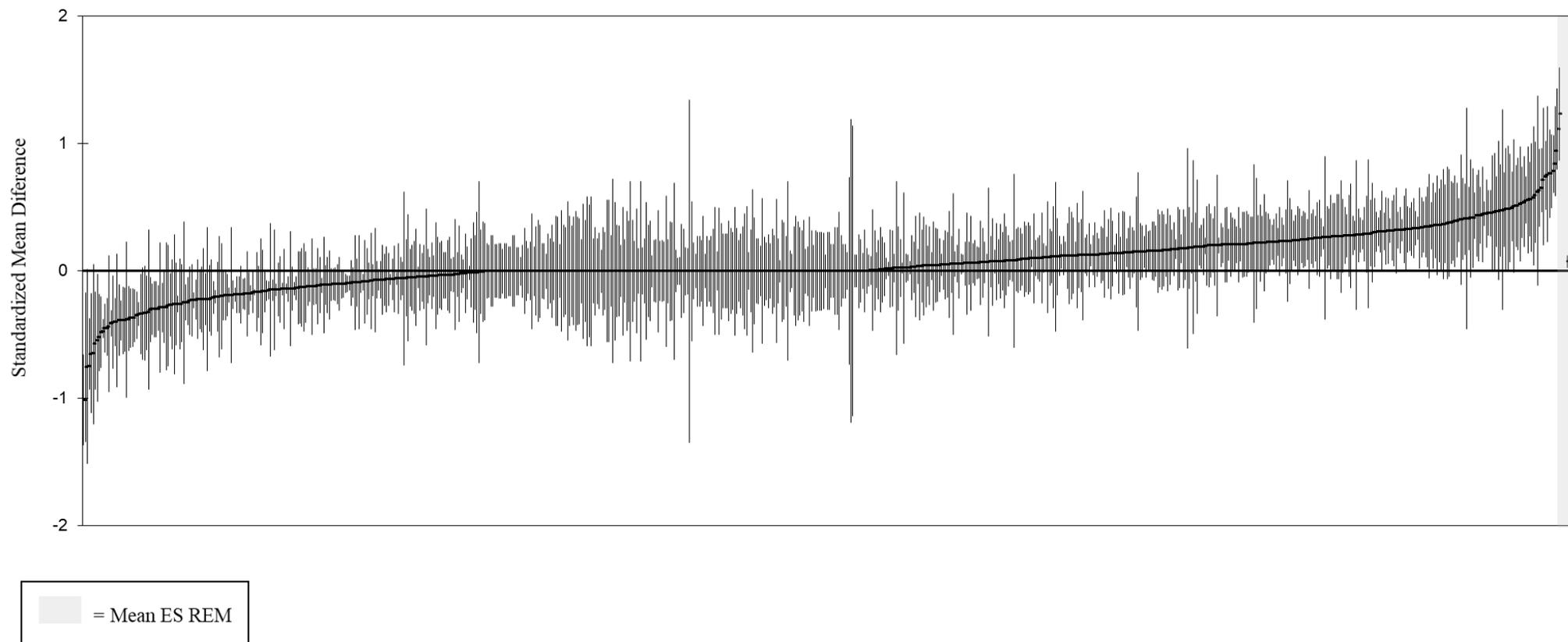


Figure 2. Caterpillar plot of the observed effect sizes for gender differences in loneliness with 95% confidence intervals.

GENDER DIFFERENCES IN LONELINESS

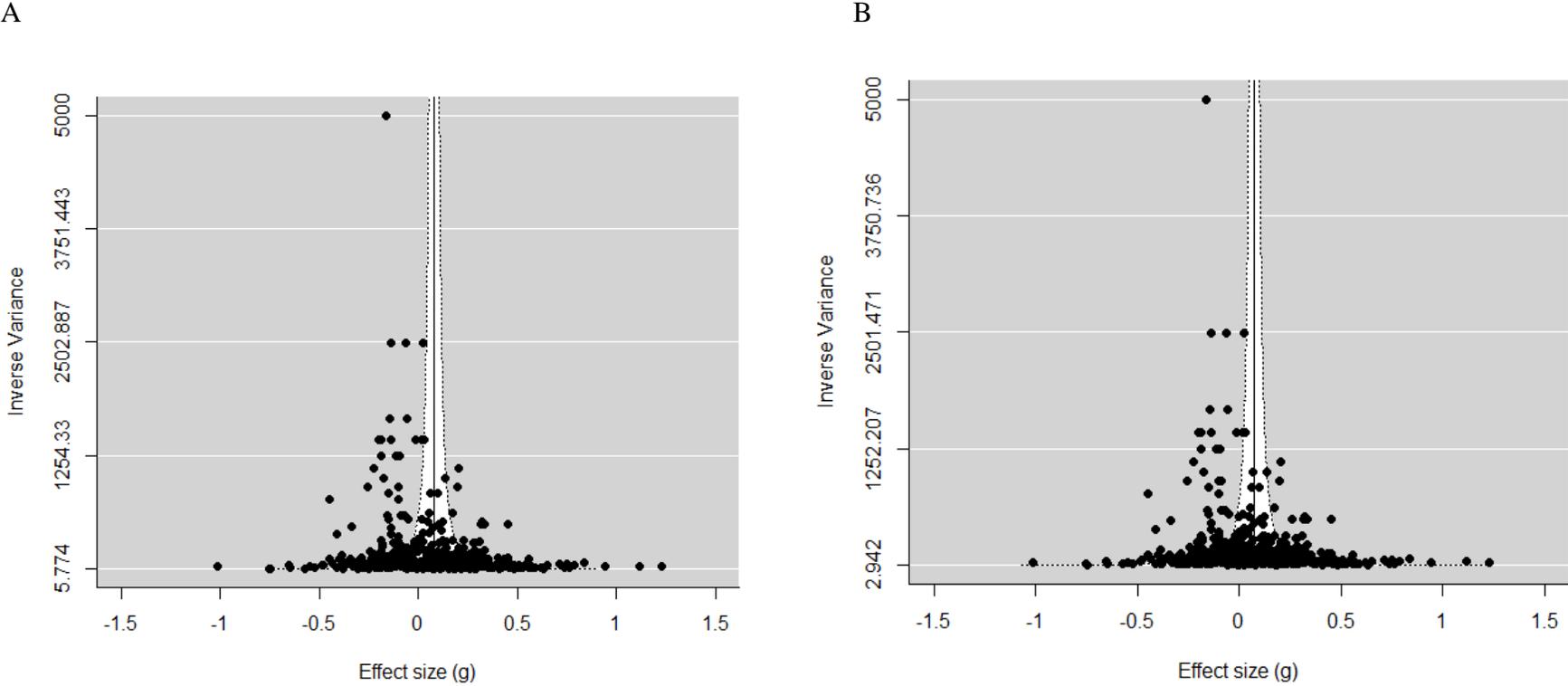


Figure 3. Funnel plots of effect sizes. Effect size (g) is plotted on the x-axis and the number of participants on the y-axis. Panel A represent the 544 effect sizes for which sufficient information was available to calculate g. Panel B represents the total dataset of 751 effect sizes.