Poststratification calculations

Table 1. *Population distribution of (non-)outlier primary studies.*

	no. of primary studies	
non-outlier	1370	70%
outlier	581	30%
Total	1951	100%

Table 2. *Sample distribution of (non-)outlier primary studies.*

	no. of primary studies	
non-outlier	303	61%
outlier	197	39%
Total	500	100%

Because we oversampled outliers, our sample is not representative for the population. Presented in Table 1 and Table 2 are the percentages of primary studies that have effect sizes classified as (non-)outliers in the population (our sample of 33 meta-analyses) and sample (our sample of 500 primary studies). In the population, 30% of effect sizes classifies as an outlier, compared to 39% of our sample, meaning our sample contains too many outlier primary study effect sizes, and too few non-outliers. First, we adjusted the sample proportions for each meta-analysis separetely, so they are in line with their corresponding population proportions. Meta-analysis 1 will be used as an example throughout this document.

Table 3. *Population distribution of (non-)outlier primary studies in meta-analysis 1.*

	no. of primary studies in MA1	
non-outlier	37	65%
outlier	20	35%
Total	57	100%

As presented in Table 3, 35% of primary study effect sizes in meta-analysis 1 is an outlier, but Table 4 shows outlier primary study effect sizes take up 50% in the sample. Note that errors in Table 4 are classified as either a differently calculated effect, an effect that did not contain enough statistical information to reproduce, or an ambigious effect. To correct for the oversampling of outliers,

Table 4.*Sample distribution of (non-)outlier primary studies and frequency distribution of (non-)errors found in meta-analysis 1.*

	no error	**error**	
non-outlier	5	5	50%
outlier	7	3	50%
Total	12	8	20 (100%)

we first calculated correction weights using type of effect size (outlier or non-outlier) as the auxiliary variable. By multiplying our sample frequencies with this weight, the proportion of (non-)outlier primary study effect sizes in the sample will be the same as the proportion of (non-)outlier primary study effect sizes in the population. We first calculate g_1:

$$g_h = \frac{\frac{N_h}{N}}{\frac{n_h}{n}}, \text{ Bethlehem, Cobben \& Schouten (2011), f.8.6}$$

where we have two strata (h_1 and h_2, corresponding to respectively non-outlier and outlier primary study effect sizes), uppercase Ns refer to population sizes (either per stratum or in total), and lowercase ns to sample sizes. The correction weights for meta-analysis 1 are:

$$g_1 = \frac{\frac{N_1}{N}}{\frac{n_1}{n}} = \frac{\frac{37}{57}}{\frac{10}{20}} = 1.2982456$$

$$g_2 = \frac{\frac{N_2}{N}}{\frac{n_2}{n}} = \frac{\frac{20}{57}}{\frac{10}{20}} = 0.7017544$$

Since we do not have any information on the number of errors in the population, we assume the same weights for non-errors and errors within each of the strata. As such, we multiply the first row of Table 4 with g_1, and the second row of Table 4 with g_2:

Table 5.*Sample distribution of (non-)outlier primary studies and frequency distribution of (non-)errors found in meta-analysis 1, corrected.*

	no error	**error**	
non-outlier	6.49	6.49	65%
outlier	4.91	2.10	35%
Total	11.40	8.60	20 (100%)

As Table 5 shows, the sample distribution of meta-analysis 1 is now proportional to the population distribution of meta-analysis 1. We used the estimates from Table 5 to calculate the (conditional) probabilities of finding an error (i.e., either a different, incomplete, or ambiguous effect (size)) in a primary study in meta-analysis 1, given that you either have a primary study effect size that is classified as a non-outlier or outlier.

$$P_{(err)} = \frac{8.60}{20} = 0.43$$

$$P_{(err|non-outlier)} = \frac{P_{(non-outlier\ and\ err)}}{P_{(non-outlier)}} = \frac{\frac{6.49}{20}}{\frac{12.98}{20}} = 0.50$$

$$P_{(err|outlier)} = \frac{P_{(outlier\ and\ err)}}{P_{(outlier)}} = \frac{\frac{2.11}{20}}{\frac{7.02}{20}} = 0.30$$