Post-Hoc Exploratory Meta-Regression Analyses

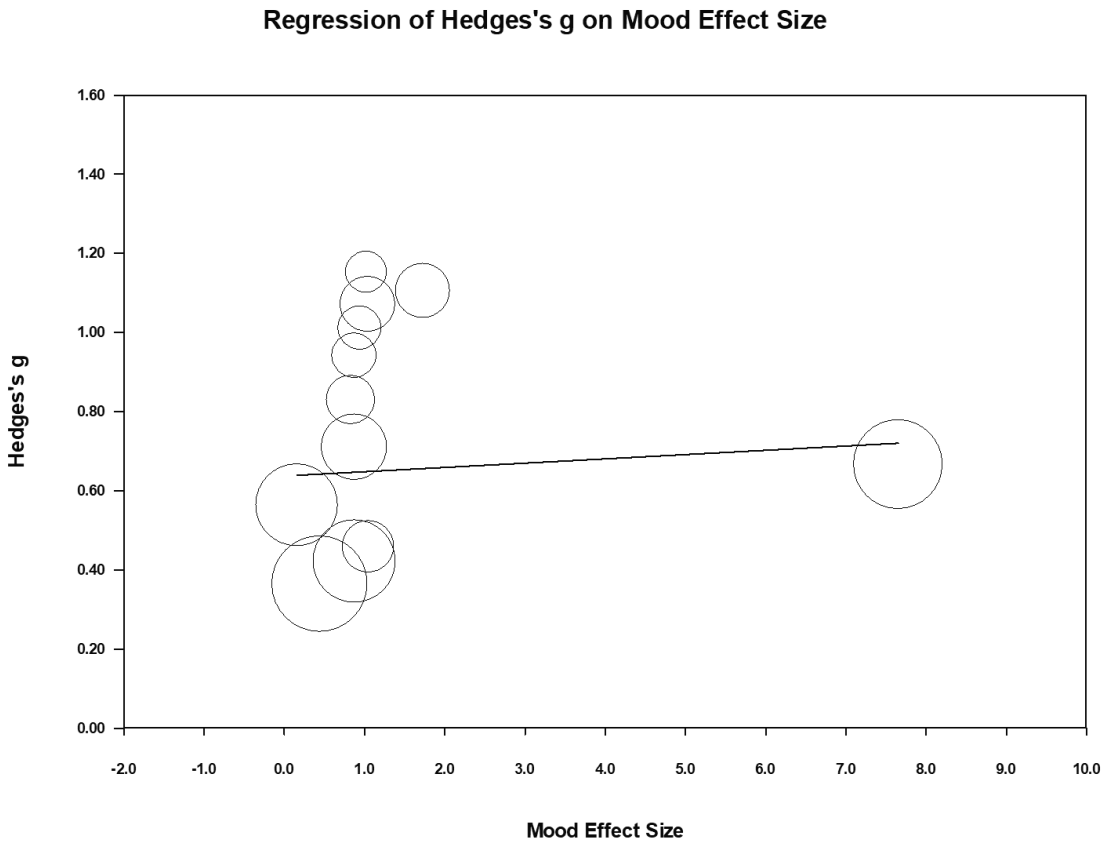
For secretory IgA concentration, 12 interventions (including general population and cancer patient sub-populations from Nota et al. 2010 as separate comparisons) had sufficient data for calculation of an effect size (Hedges' g) representing the increase in mood from pre- to post-intervention. Mood effect size was added as a predictor variable in a random effects meta-regression analysis (Table S1, Figure S1). An inspection of the bubble plot and model results indicates a very small, and not statistically significant increase in s-IgA Concentration effect size with increasing mood effect sizes. However, it was clear the regression line is being disproportionally influenced by one study with an exceptionally large reported mood effect.

Table S1: Model Results for s-IgA Concentration Meta-Regression

Covariate	Coefficient	Standard Error	95% Lower	95% Upper	Z-value	2-sided P-value
Intercept	0.64	0.10	0.44	0.83	6.35	.000
Mood Effect Size	0.01	0.03	-0.05	0.07	0.33	.739

Test of the model: Q = 0.11, df = 1, p = .739
Goodness of fit: Tau² = 0.01, Tau = 0.12, I² = 17.22%, Q = 12.08, df = 10, p = .280
R² analogue = .00

Figure S1: Bubble Plot of s-IgA Concentration and Mood Effect Sizes



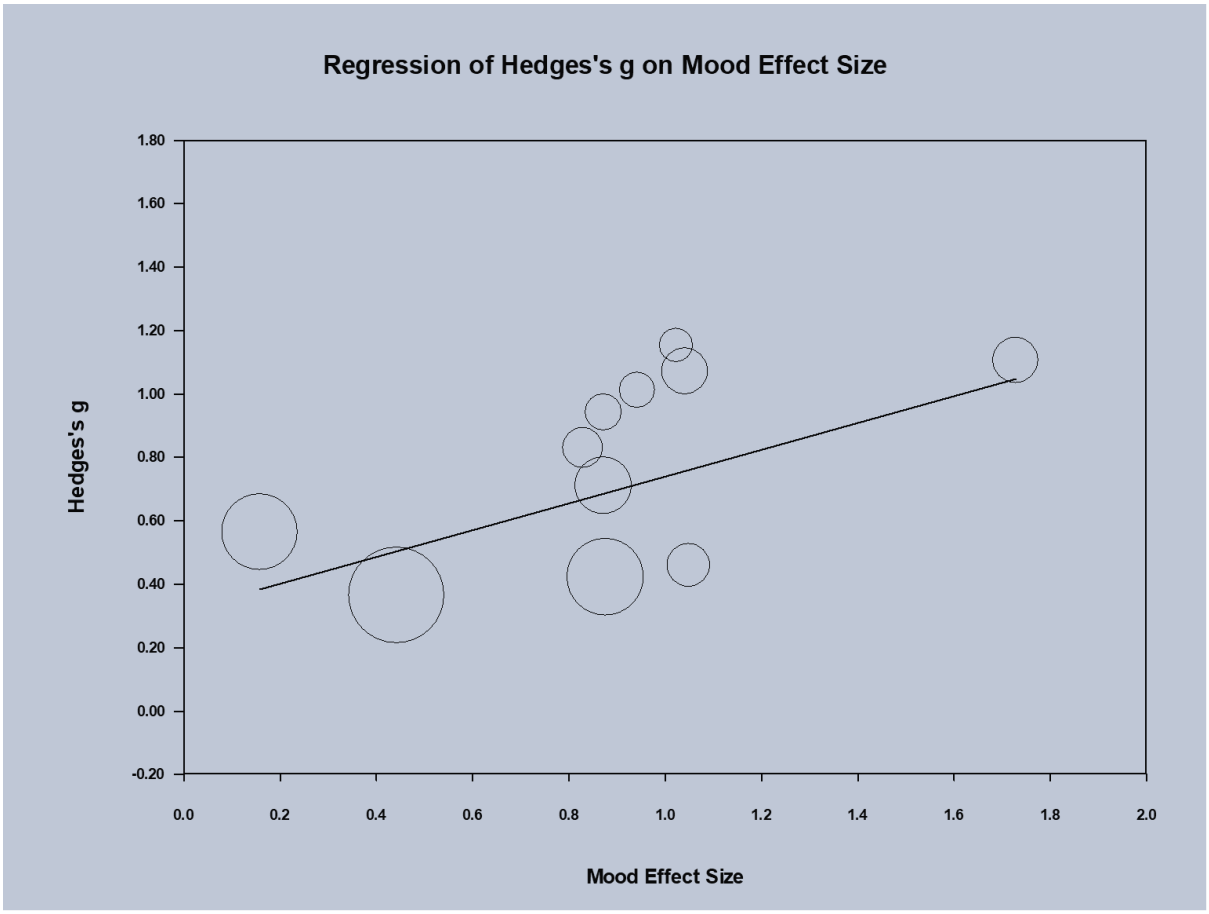
The calculated effect size of one intervention (Pawlow & Jones, 2005) was a considerable outlier (d=7.65) and therefore we performed an additional meta-regression analysis, excluding this intervention (Table S2, Figure S2). An inspection of the bubble plot and model results indicates that after excluding this intervention there is a statistically significant increase in s-IgA Concentration effect size with increasing mood effect sizes.

Table S2: Model Results for S-IgA Concentration Meta-Regression Excluding Pawlow & Jones (2005)

Covariate	Coefficient	Standard Error	95% Lower	95% Upper	Z-value	2-sided P-value
Intercept	0.32	0.16	0.00	0.63	1.97	.048
Mood Effect Size	0.42	0.20	0.04	0.81	2.16	.031

Test of the model: Q = 4.68, df = 1, p = .031
Goodness of fit: Tau² = 0.00, Tau = 0.00, I² = 0.00%, Q = 7.62, df = 9, p = .572
R² analogue = 1.00

Figure S2: Bubble Plot of s-IgA Concentration and Mood Effect Sizes Excluding Pawlow & Jones (2005)



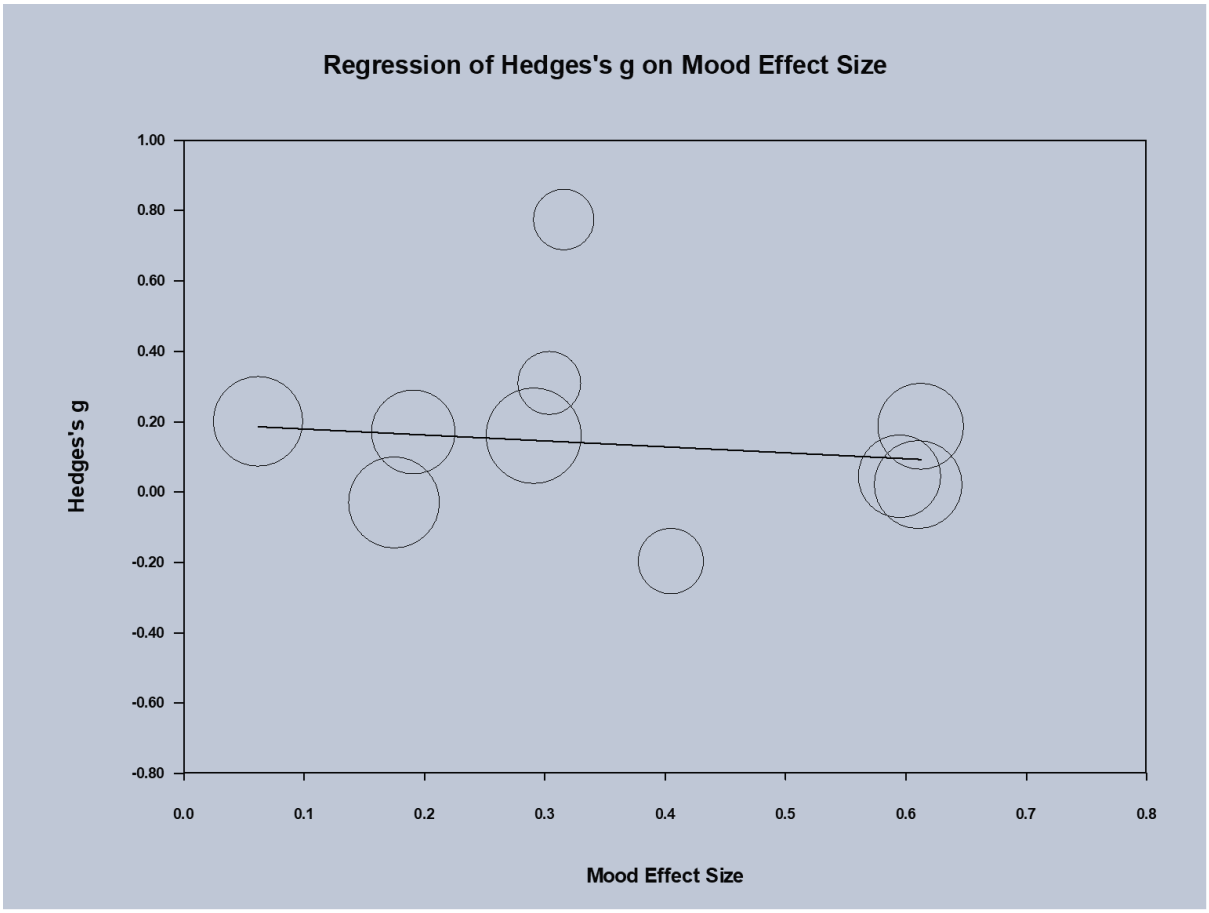
For IL-6, eleven interventions (including carer, patient and bereaved carer sub-populations from Fancourt et al. 2016, primed and unprimed sub-populations from Kiecolt-Glaser et al. 2008, and younger and older adult sub-populations from Koyama et al. 2009 as separate interventions) had sufficient data for calculation of an effect size (Hedges' g) representing the increase in mood from pre- to post-intervention. Mood effect size was added as a predictor variable in a random effects meta-regression analysis (Table S4, Figure S4). An inspection of the bubble plot and model results indicates a small, and not statistically significant, decrease in IL-6 production effect size with increasing mood effect sizes.

Table S3: Model Results for IL-6 Production Meta-Regression

Covariate	**Coefficient**	**Standard Error**	**95% Lower**	**95% Upper**	**Z-value**	**2-sided P-value**
Intercept	0.20	0.12	-0.05	0.44	1.59	.112
Mood Effect Size	-0.17	0.31	-0.77	0.43	-0.55	.581

Test of the model: Q = 0.31, df = 1, p = .581
Goodness of fit: Tau² = 0.02, Tau = 0.13, I² = 50.34%, Q = 16.11, df = 8, p = .041
R² analogue = .00

Figure S3: Bubble Plot of IL-6 Production and Mood Effect Sizes



Limitations of the Above Analyses

The meta-regression analyses presented in this appendix are exploratory and should be interpreted with considerable caution. For each analysis, there is a relatively few number of studies included. As such the statistical power of these tests are low. Further, they do not include predictors of additional potential sources of variation between trials such as intervention length, assay type or mean participant age. The inclusion of these variables was precluded due to the low number of studies eligible for inclusion. Further studies are needed to clarify the exact nature of the relationship between the size of acute mood changes and their impact on immune outcomes.