Title of the Paper

Student's Name

University

Course

Professor

Date

RESULTS, DISCUSSIONS, AND CONCLUSIONS

The study used a total of 83 different studies. Some observations had missing observations, which were imputed with estimates from the measures of central tendency. For a perfectly symmetric distribution, the mean, mode, and the median are the same [1], so the study imputed the missing observations with the median since the median is the only measure of central location that is least affected by the outliers [2] .

Since the study had pre-calculated effect sizes and no groupings as treatments and controls, the study used the Meta-Analysis with pre-calculated effect sizes with variance as the measure of variability. Since the study had no information on the variance but had the standard deviation, the study squared the standard deviation to come up with the estimates of the variance using the formula $sd = \sqrt{var}$, which implies that by squaring the standard deviation you get the variance.

Some studies had no information on standard deviation. In such cases, the study estimated the variances for all the studies with full information and later imputed the missing variances with the median of the observed measurements.

The fixed effect (FE) model and the random effects (RE) model are the two methods that are most frequently used to combine the study data in a meta-analysis [3]. The choice between these two models, which are linked to many assumptions, could have a significant impact on the findings of meta-analyses. The reported treatment effects are dispersed around a single genuine treatment effect in the FE model, with the distribution variance being completely determined by within-study variances. Assumed to be related and deriving from the same underlying distribution, the genuine treatment effects for each research are estimated by the observed treatment effects in the RE model.

The study used the Hunter-Schmidt estimation method to take care of the unreliable information that may arise die to the imputation of the missing values [4].

Since the genuine treatment effects are derived from the underlying distribution and estimated by the observed effects, the study uses the RE model.

After so doing, the study grouped the analyses into seven different Meta-Analyses as follows;

1. Meta-Analysis on the association between overconfidence and risk.
2. Meta-Analysis on the association between risk and innovation.

3. Meta-Analysis of the association between risk and performance.
4. Meta-Analysis on the association between risk and venture formation.
5. Meta-Analysis on the association between overconfidence and innovation.
6. Meta-Analysis on the association between overconfidence and performance.
7. Meta-Analysis on the association between overconfidence and venture formation.

The analysis was then carried out per subgroup, and the following results were obtained.

1. Meta-Analysis on the association between overconfidence and risk.

Non-combinability of studies

Cochran Q = 1.411 (df = 25) P = 1.000

I^2 (inconsistency) = 0.00%

The Cochran Q value of 1.411 with a p-value of 1.00 implies that we do not reject the null hypothesis that the data is heterogenic and conclude that the data is considered to be heterogenic. The I-squared value of 0.0%, however, implies inconsistency within the studies.

Hunter-Schmidt random effects

Pooled correlation = .125 (95% CI = 0.111 to 0.140)

t (test Correlation) = 6.512137 P < 0.0001

Since the p<.0001 is less than the 5% significance level, we reject the null hypothesis the individual-specific effects are uncorrelated with the independent variable and conclude at a 5% confidence interval that there is a correlation between individual-specific effects and the independent variable.

A weak direct association exists between risk and overconfidence according to the pooled correlation coefficient of 0.125. It follows that an increase in overconfidence leads to a corresponding increase in risk, which significant, as the confidence interval does not contain zero.

Bias indicators

Begg-Mazumdar: Kendall's tau = 0.071429 P = 0.9049 (low power)

Egger: bias = 10.348335 (95% CI = -20.031214 to 40.727885) P = 0.4365

The Egger's test gave a p-value of .4365, a value greater than the 5% significance level. It follows that we do not reject the null hypothesis of no publication bias and conclude at a 5% level of significance that there existed no publication bias in the study.
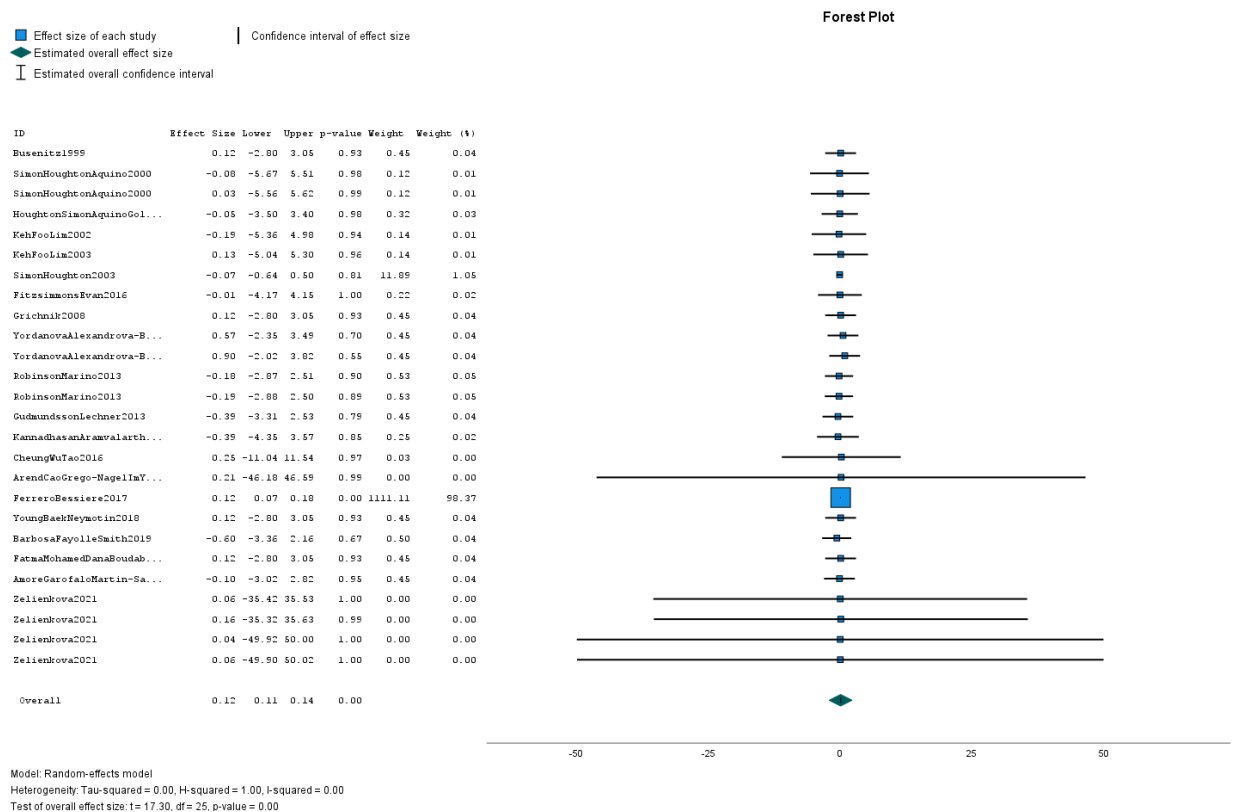
Observed variance across studies: 0.071

Variance due to sampling error: 0.075

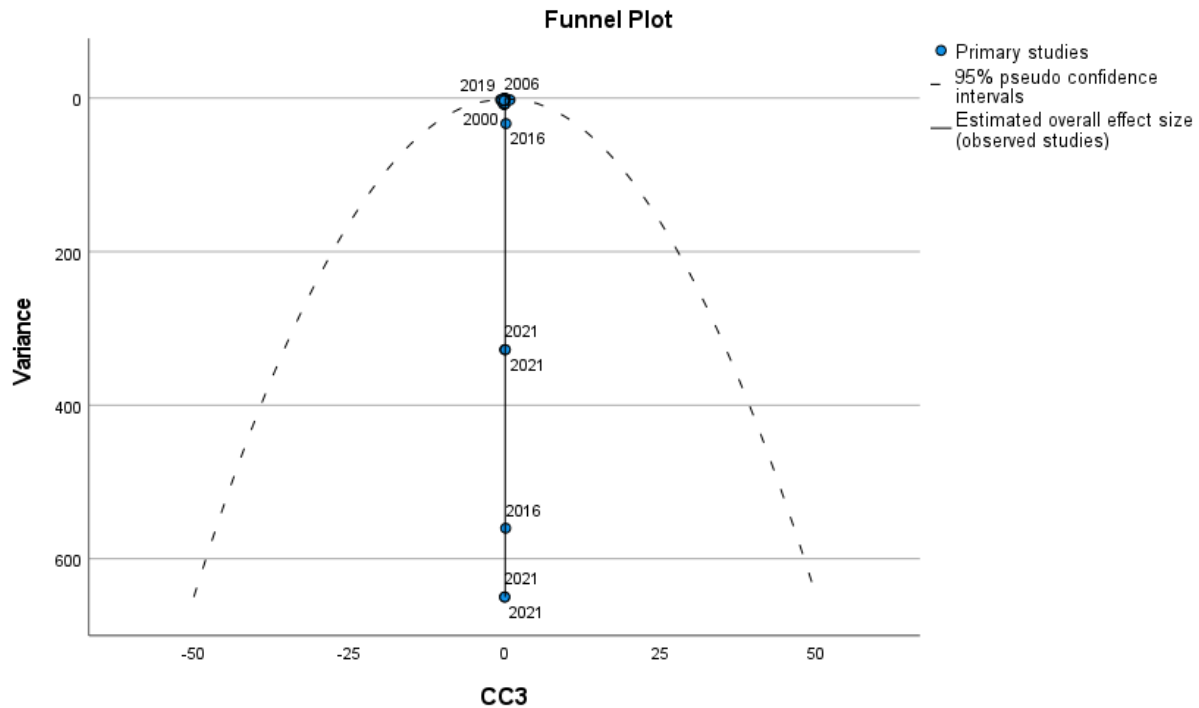Variance in the population correlations: 0.013146

95% Credibility interval for weighted mean correlation: 0.14954 to 0.598984

Forest plot

ID	Effect Size	Lower	Upper	p-value	Weight	Weight (%)
Busenitz1999	0.12	-2.80	3.05	0.93	0.45	0.04
SimonHoughtonAquino2000	-0.08	-5.67	5.51	0.98	0.12	0.01
SimonHoughtonAquino2000	0.03	-5.56	5.62	0.99	0.12	0.01
HoughtonSimonAquinoGol...	-0.05	-3.50	3.40	0.98	0.32	0.03
KehFooLim2002	-0.19	-5.36	4.98	0.94	0.14	0.01
KehFooLim2003	0.13	-5.04	5.30	0.96	0.14	0.01
SimonHoughton2003	-0.07	-0.64	0.50	0.81	11.89	1.05
FitzsimmonsEvan2016	-0.01	-4.17	4.15	1.00	0.22	0.02
Grichnik2008	0.12	-2.80	3.05	0.93	0.45	0.04
YordanovaAlexandrova-B...	0.57	-2.35	3.49	0.70	0.45	0.04
YordanovaAlexandrova-B...	0.90	-2.02	3.82	0.55	0.45	0.04
RobinsonMarino2013	-0.18	-2.87	2.51	0.90	0.53	0.05
RobinsonMarino2013	-0.19	-2.88	2.50	0.89	0.53	0.05
GudmundssonLechner2013	-0.39	-3.31	2.53	0.79	0.45	0.04
KannadhasanAramvalarth...	-0.39	-4.35	3.57	0.85	0.25	0.02
CheungWuTao2016	0.25	-11.04	11.54	0.97	0.03	0.00
ArendCaoGrego-NagelImY...	0.21	-46.18	46.59	0.99	0.00	0.00
FerreroBessiere2017	0.12	0.07	0.18	0.00	1111.11	98.37
YoungBaekNeymotin2018	0.12	-2.80	3.05	0.93	0.45	0.04
BarbosaFayolleSmith2019	-0.60	-3.36	2.16	0.67	0.50	0.04
FatmaMohamedDanaBoudab...	0.12	-2.80	3.05	0.93	0.45	0.04
AmoreGarofaloMartin-Sa...	-0.10	-3.02	2.82	0.95	0.45	0.04
Zelienkova2021	0.06	-35.42	35.53	1.00	0.00	0.00
Zelienkova2021	0.16	-35.32	35.63	0.99	0.00	0.00
Zelienkova2021	0.04	-49.92	50.00	1.00	0.00	0.00
Zelienkova2021	0.06	-49.90	50.02	1.00	0.00	0.00
Overall	0.12	0.11	0.14	0.00		

Model: Random-effects model
Heterogeneity: Tau-squared = 0.00, H-squared = 1.00, I-squared = 0.00
Test of overall effect size: t = 17.30, df = 25, p-value = 0.00

Most of the weights are unequal; therefore, the forest plot indicates heterogeneity in the study. Consequently, there is no effect since most boxes lie within the value zero. The sizes of the boxes are proportionate to the weight of the study concerning the pooled estimate. The I-squared gives the magnitude for heterogeneity. In this case, heterogeneity is unimportant since I-squared lies below 40%. The p-value is less than 0.05, indicating a significant difference.

Funnel plot

Each dot in the funnel plot represents a single study; in this funnel plot above, the dots are evenly split, and most are at the top, indicating that the data set is representative and there is no bias. The standard errors are almost the same size since the studies fall on a horizontal line instead of assuming the shape of a pyramid.

Bubble plot

Bubble Plot

Moderator: Var3

Model: Random-effects model

Weights: Random-effects
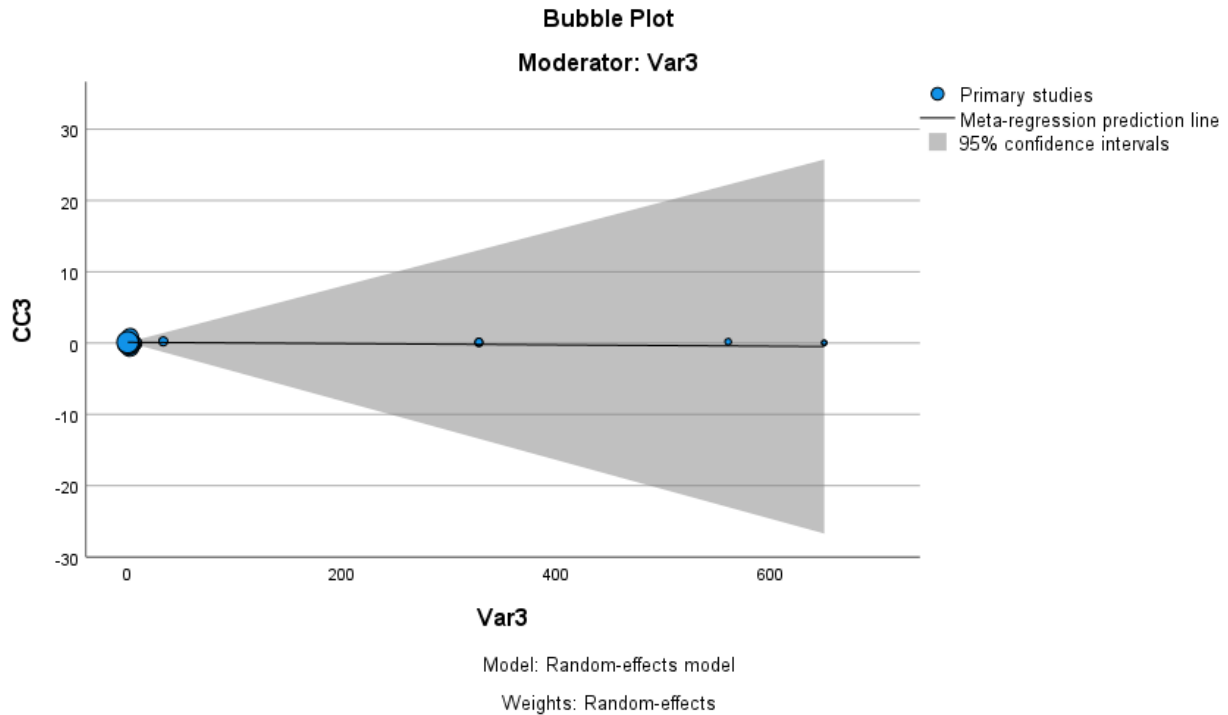
There is no relationship between the x and y variables since the bubbles lie in an almost horizontal line. The bubble sizes are decreasing in size, indicating a downward trend.

Conclusion

According to the pooled correlation coefficient of 0.125, the study's findings show that there is only a modest direct relationship between risk and overconfidence. Given that the confidence interval does not contain a zero, this suggests that risk increases as overconfidence increases, which is substantial.

2. **Meta-Analysis on association between risk and innovation**

Non-combinability of studies

Cochran Q = .989 (df = 7) P = .995

I^2 (inconsistency) = 0.00%

The Cochran Q value of .989 with a p-value of .995 implies that we do not reject the null hypothesis that the data is heterogenic and conclude that the data is considered to be heterogenic. The I-squared value of 0.0%, however, implies that there was inconsistency within the studies.

Pooled correlation = .727 (95% CI = 0.284 to 1.270)

t (test Correlation) = 3.278 P =.017

Since the p-value of .017 is less than the 5% significance level, we reject the null hypothesis the individual-specific effects are uncorrelated with the independent variable and conclude at a 5% confidence interval that there is a correlation between individual-specific effects and the independent variable.

There exist a strong correlation between risk and innovation according to the pooled correlation coefficient of 0.727. It follows that an increase in risk leads to a corresponding increase in innovation, which significant, as the confidence interval does not contain zero.

Bias indicators

Begg-Mazumdar: Kendall's tau = 0.00 P = 0.9049 (low power)

Egger: bias = 10.348335 (95% CI = -20.031214 to 40.727885) P = 0.4365

The Egger's test gave a p-value of .4365, a value greater than the 5% significance level. It follows that we do not reject the null hypothesis of no publication bias and conclude at a 5% level of significance that there existed no publication bias in the study.
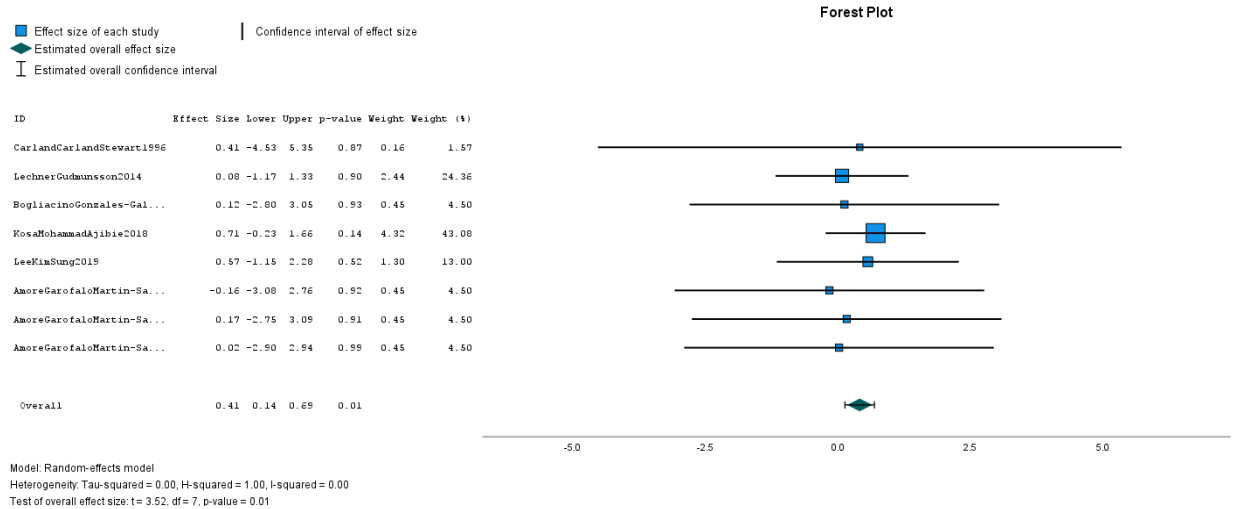
Observed variance across studies: 0.1175

Variance due to sampling error: 0.1353

Variance in the population correlations: 0.2219

95% Credibility interval for weighted mean correlation: 0.184 to 1.270

Forest plot

Forest Plot

ID	Effect Size	Lower	Upper	p-value	Weight	Weight (%)
CarlandCarlandStewart1996	0.41	-4.53	5.35	0.87	0.16	1.57
LechnerGudmunsson2014	0.08	-1.17	1.33	0.90	2.44	24.36
BogliacinoGonzales-Gal...	0.12	-2.80	3.05	0.93	0.45	4.50
KosaMohammadAjibie2018	0.71	-0.23	1.66	0.14	4.32	43.08
LeeKimSung2019	0.57	-1.15	2.28	0.52	1.30	13.00
AmoreGarofaloMartin-Sa...	-0.16	-3.08	2.76	0.92	0.45	4.50
AmoreGarofaloMartin-Sa...	0.17	-2.75	3.09	0.91	0.45	4.50
AmoreGarofaloMartin-Sa...	0.02	-2.90	2.94	0.99	0.45	4.50
Overall	0.41	0.14	0.69	0.01		

Model: Random-effects model
Heterogeneity: Tau-squared = 0.00, H-squared = 1.00, I-squared = 0.00
Test of overall effect size: t = 3.52, df = 7, p-value = 0.01

The weights are not equal; therefore, heterogeneity exists in the study. The I-squared is less than 40%, indicating that the heterogeneity is unimportant. Some boxes are not in the zero zones; therefore, the study has an effect. The p-value is less than 0.05, therefore indicating a significant difference.
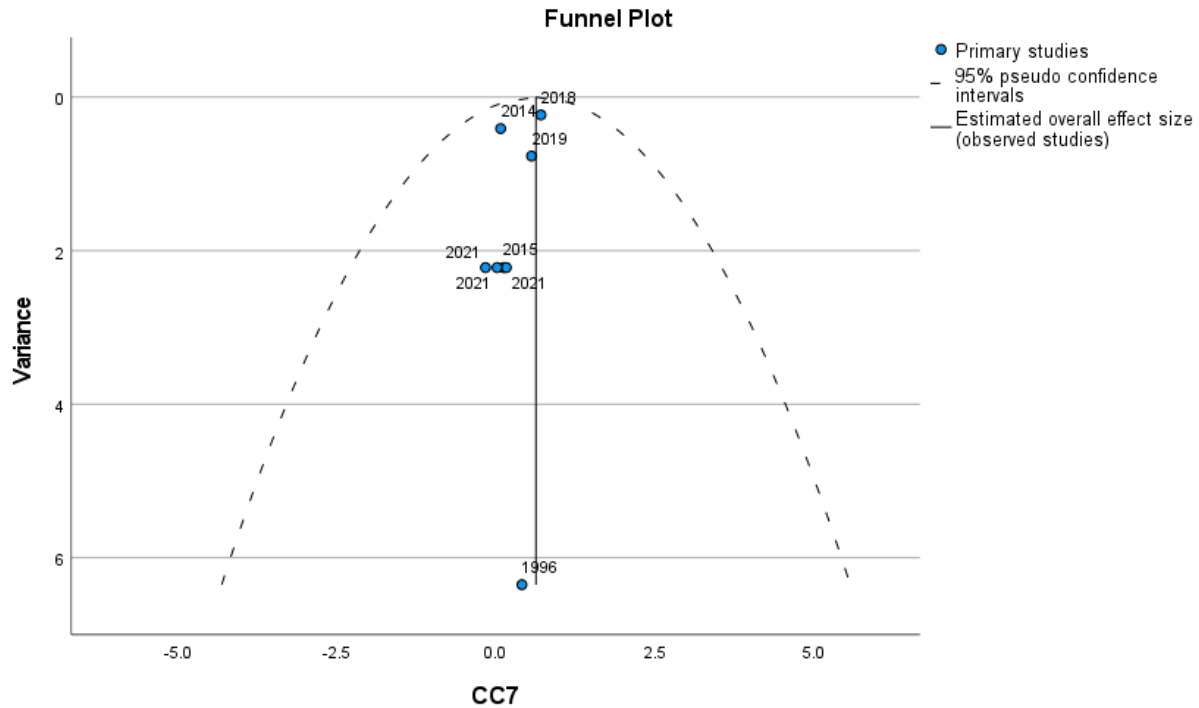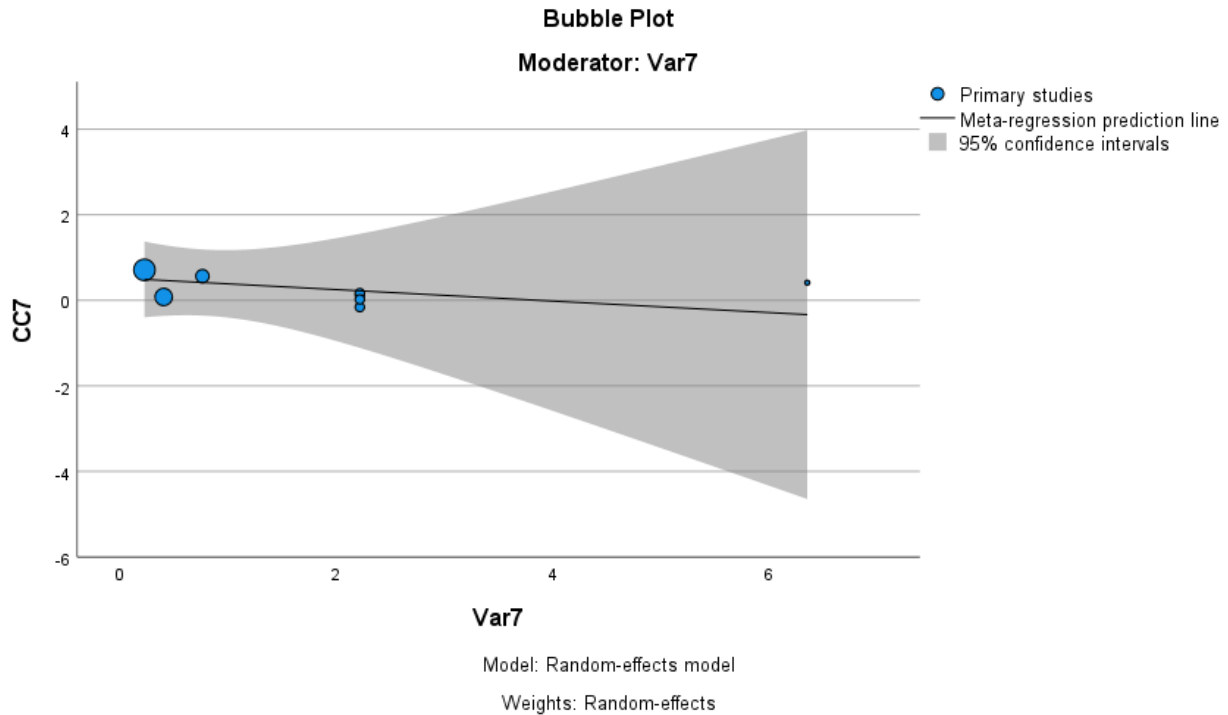
Funnel plot

Funnel Plot

Each dot in the funnel plot represents a single study; in this funnel plot above, the dots are evenly split, and most are at the top, indicating that the data set is representative and there is no bias. The standard errors are not the same size since the studies do not lie on the horizontal line and tend to assume the shape of a pyramid.

Bubble plot

Bubble Plot

Moderator: Var7

Model: Random-effects model

Weights: Random-effects

A linear negative relationship exists between the x and y variables since the bubbles lie in an almost downward sloping line. The bubble sizes are decreasing in size, indicating a downward trend.

Conclusion

According to the pooled correlation coefficient of 0.727, the study's findings show that there is a strong direct relationship between risk and overconfidence. Given that the confidence interval does not include a zero, this indicates that as overconfidence increases, risk also increases.

3. **Meta-Analysis on association between risk and performance**

Non-combinability of studies

Cochran Q = 2.161 (df = 8) P = .976

I^2 (inconsistency) = 0.00%

The Cochran Q value of 2.161 with a p-value of .976 implies that we do not reject the null hypothesis that the data is heterogenic and conclude that the data is considered to be heterogenic. The I-squared value of 0.0%, however, implies inconsistency within the studies.

Hunter-Schmidt random effects

Pooled correlation = .203 (95% CI = -.464 to 0.870)

t (test Correlation) = .720 P =.495

Since the p-value of .495 is greater than the 5% level of significance, we do not reject the null hypothesis that the individual-specific effects are uncorrelated with the independent variable and conclude at a 5% confidence interval that there is no correlation between individual-specific effects and the independent variable.

A strong direct association exists between risk and performance according to the pooled correlation coefficient of 0.720. It follows that an increase in risk leads to a corresponding increase in performance which is significant as the confidence interval does contain zero.

Bias indicators

Begg-Mazumdar: Kendall's tau = 0.00 P = 0.9049 (low power)

Egger: bias = .2820 (95% CI = -.464 to .870) P = 0.495

The Egger's test gave a p-value of .495, a value greater than the 5% level of significance. It follows that we do not reject the null hypothesis of no publication bias and conclude at a 5% level of significance that there existed no publication bias in the study.
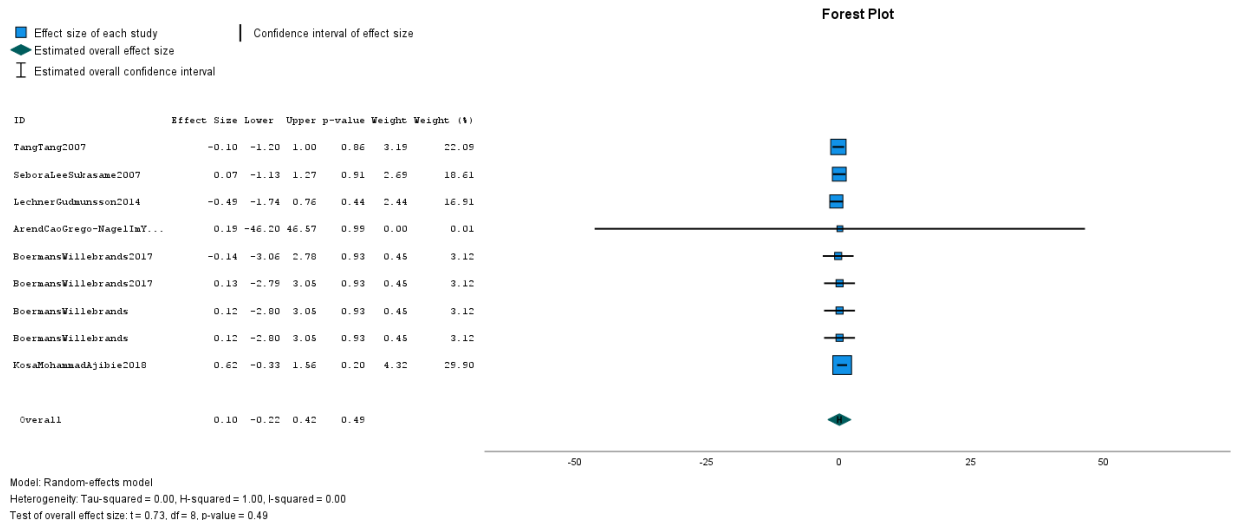
Observed variance across studies: 0.1368

Variance due to sampling error: 0.1761

Variance in the population correlations: 0.1368

95% Credibility interval for weighted mean correlation: -.223 to .423

Forest plot

ID	Effect Size	Lower	Upper	p-value	Weight	Weight (%)
TangTang2007	-0.10	-1.20	1.00	0.86	3.19	22.09
SeboraLeeSukasame2007	0.07	-1.13	1.27	0.91	2.69	18.61
LechnerGudmunsson2014	-0.49	-1.74	0.76	0.44	2.44	16.91
ArendCaoGrego-NagelImY...	0.19	-46.20	46.57	0.99	0.00	0.01
BoermansWillebrands2017	-0.14	-3.06	2.78	0.93	0.45	3.12
BoermansWillebrands2017	0.13	-2.79	3.05	0.93	0.45	3.12
BoermansWillebrands	0.12	-2.80	3.05	0.93	0.45	3.12
BoermansWillebrands	0.12	-2.80	3.05	0.93	0.45	3.12
KosaMohammadAjibie2018	0.62	-0.33	1.56	0.20	4.32	29.90
Overall	0.10	-0.22	0.42	0.49		

Model: Random-effects model
Heterogeneity: Tau-squared = 0.00, H-squared = 1.00, I-squared = 0.00
Test of overall effect size: t = 0.73, df = 8, p-value = 0.49

Most of the weights are not equal; therefore, the forest plot indicates heterogeneity in the study. Consequently, there is no effect since most boxes lie within the value zero. The sizes of the boxes are proportionate to the weight of the study concerning the pooled estimate. The I-squared gives the magnitude for heterogeneity. In this case, heterogeneity is unimportant since I-squared lies below 40%. The p-value is greater than 0.05, indicating no significant difference.
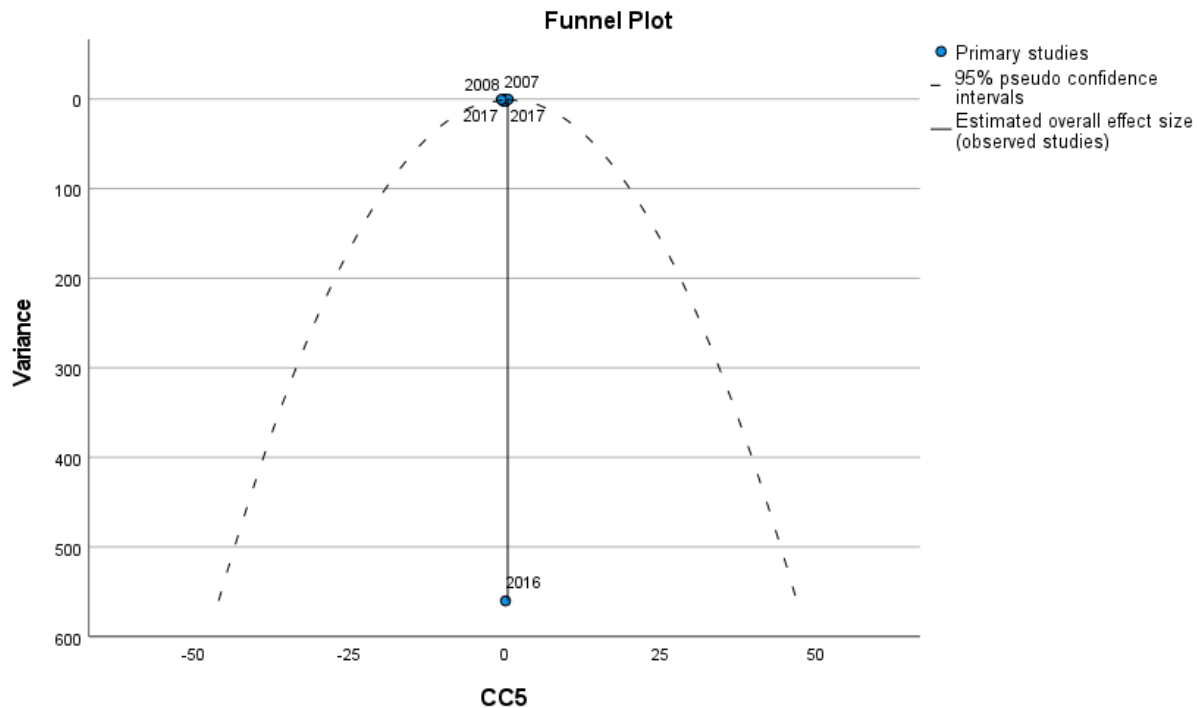
Funnel plot

Funnel Plot

Each dot in the funnel plot represents a single study. In this funnel plot above, the dots are evenly split, and most are at the top, indicating that the data set is representative and there is no bias. The standard errors are almost the same size since the studies lie on the horizontal line and do not tend to assume the shape of a pyramid.

Bubble plot

Bubble Plot

Moderator: Var5
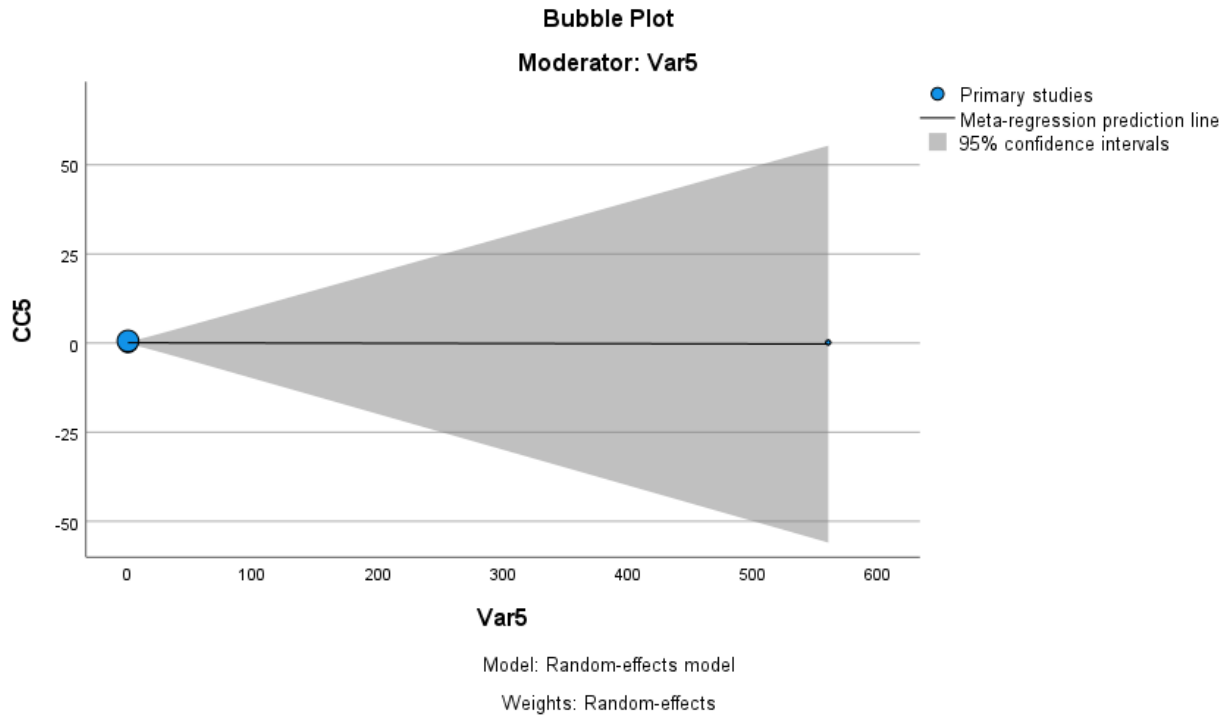
There is no relationship between the x and y variables since the bubbles lie at one point. The bubble sizes are constant in size.

Conclusion

According to the pooled correlation coefficient of 0.720, the study's findings show a strong direct relationship between risk and performance. This suggests that as risk increases, performance increases as well, which is noteworthy because the confidence interval doesn't include a zero.

4. **Meta-Analysis on association between risk and venture formation**

Non-combinability of studies

Cochran Q = .475 (df = 7) P = 1.000

I² (inconsistency) = 0.00%

The Cochran Q value of .475 with a p-value of 1.00 implies that we do not reject the null hypothesis that the data is heterogenic and conclude that the data is considered to be heterogenic. The I-squared value of 0.0%, however, implies inconsistency within the studies.

Pooled correlation = .225 (95% CI = 0.111 to 0.140)

t (test Correlation) = 1.673 P =.138

Since the p-value of .138 is greater than the 5% level of significance, we do not reject the null hypothesis that the individual-specific effects are uncorrelated with the independent variable and conclude at a 5% confidence interval that there is no correlation between individual-specific effects and the independent variable.

A strong direct association exists between risk and venture formation according to the pooled correlation coefficient of 0.225. An increase in risk leads to a corresponding increase in venture formation, which is significant as the confidence interval does not contain zero.

Bias indicators

Begg-Mazumdar: Kendall's tau = 0 P = 0.9049 (low power)

Egger: bias = .3861 (95% CI = -.232 to 1.570) P = 0.119

The Egger's test gave a p-value of .119, a value greater than the 5% significance level. It follows that we do not reject the null hypothesis of no publication bias and conclude at a 5% level of significance that there existed no publication bias in the study.
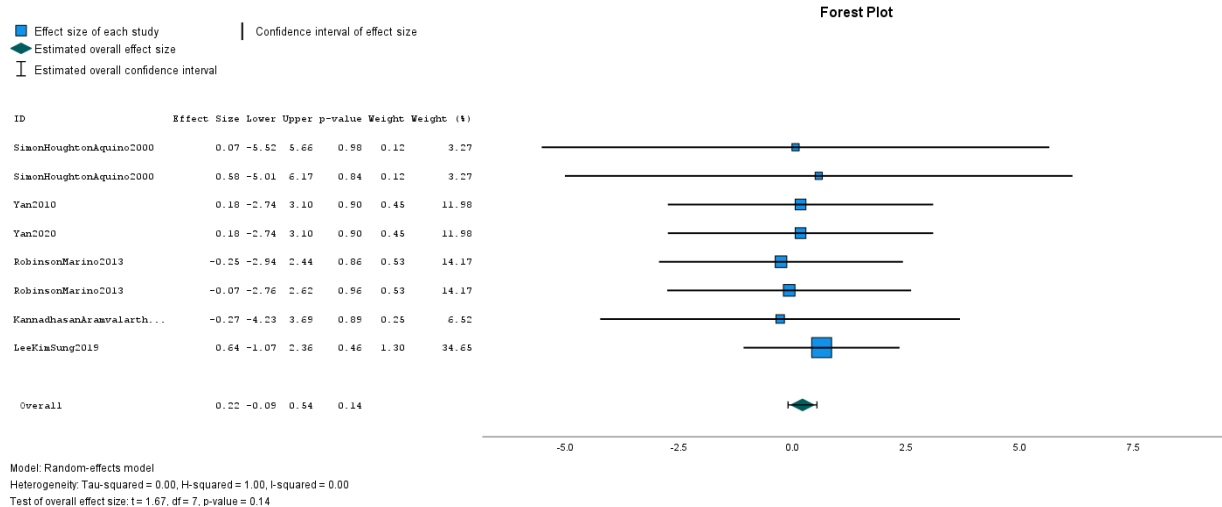
Observed variance across studies: 0.1344

Variance due to sampling error: 0.1481

Variance in the population correlations: 0.3861

95% Credibility interval for weighted mean correlation: -.232 to 1.570

Forest plot

Forest Plot

ID	Effect Size	Lower	Upper	p-value	Weight	Weight (%)
SimonHoughtonAquino2000	0.07	-5.52	5.66	0.98	0.12	3.27
SimonHoughtonAquino2000	0.58	-5.01	6.17	0.84	0.12	3.27
Yan2010	0.18	-2.74	3.10	0.90	0.45	11.98
Yan2020	0.18	-2.74	3.10	0.90	0.45	11.98
RobinsonMarino2013	-0.25	-2.94	2.44	0.86	0.53	14.17
RobinsonMarino2013	-0.07	-2.76	2.62	0.96	0.53	14.17
KannadhasanAramvalarth...	-0.27	-4.23	3.69	0.89	0.25	6.52
LeeKimSung2019	0.64	-1.07	2.36	0.46	1.30	34.65
Overall	0.22	-0.09	0.54	0.14		

Model: Random-effects model
Heterogeneity: Tau-squared = 0.00, H-squared = 1.00, I-squared = 0.00
Test of overall effect size: t = 1.67, df = 7, p-value = 0.14

Most of the weights are unequal; therefore, the forest plot indicates heterogeneity in the study. Consequently, there is an effect since most boxes lie without the value zero. The sizes of the boxes are proportionate to the weight of the study in relation to the pooled estimate. The I-squared gives the magnitude for heterogeneity. In this case, heterogeneity is unimportant since I-squared lies below 40%. The p-value is greater than 0.05, therefore indicating there is no significant difference.
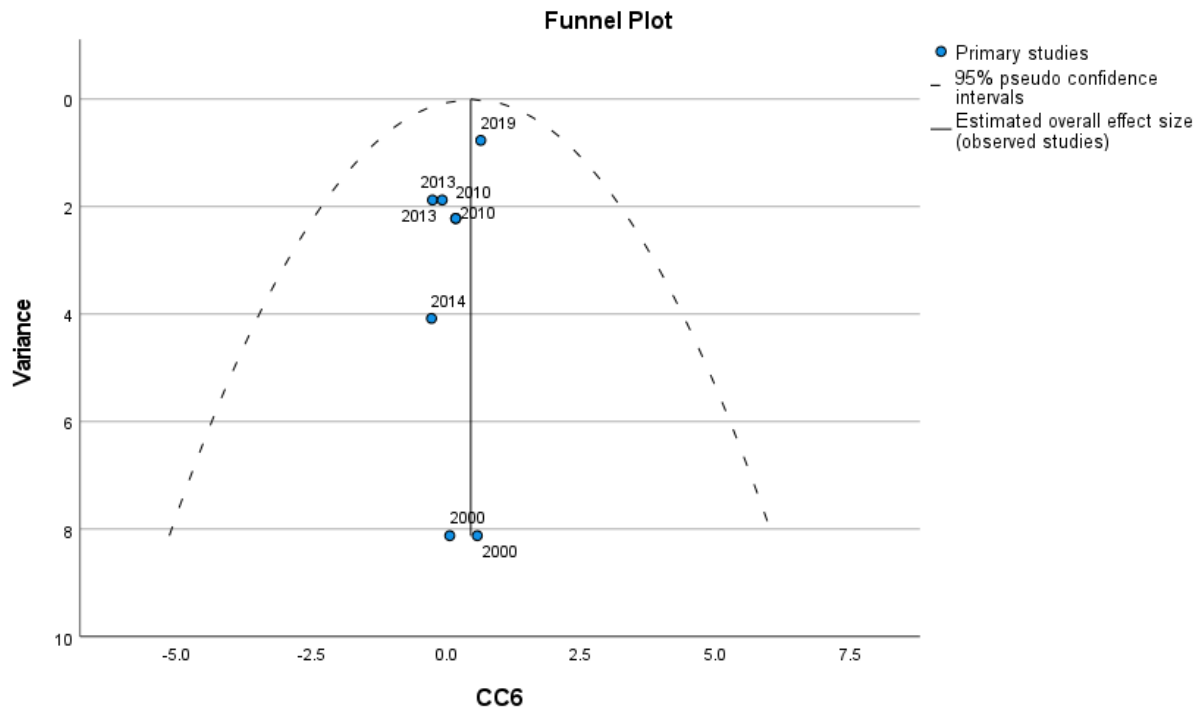
Funnel plot

Funnel Plot

Each dot in the funnel plot represents a single study. In this funnel plot above, the dots are not evenly split, and most are not at the top, indicating that the data set is not representative and there is bias. The standard errors are not the same size since the studies do not lie on the horizontal line and tend to assume the shape of a pyramid.

Bubble plot

Bubble Plot
Moderator: Var6

Model: Random-effects model
Weights: Random-effects
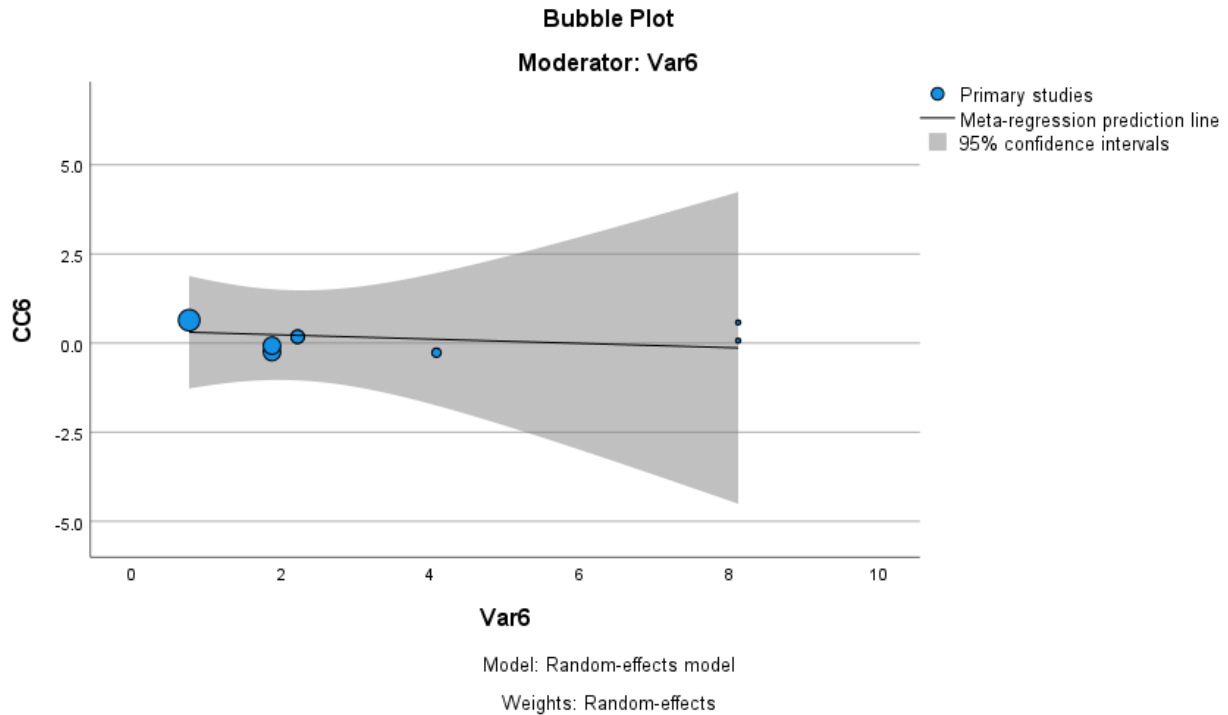
A linear negative relationship exists between the x and y variables since the bubbles follow a downward slope. The bubble sizes are reducing, indicating a downward trend.

Conclusion

According to the pooled correlation coefficient of 0.225, the study's findings show a strong direct relationship between risk and venture formation. Due to the fact that the confidence interval does not contain a zero, this suggests that as risk increases, venture formation also increases.

5. Meta-Analysis on association between overconfidence and innovation

Non-combinability of studies

Cochran Q = .068 (df = 8) P = 1.000

I^2 (inconsistency) = 0.00%

The Cochran Q value of .068 with a p-value of 1.00 implies that we do not reject the null hypothesis that the data is heterogenic and conclude that the data is considered to be heterogenic. The I-squared value of 0.0%, however, implies inconsistency within the studies.

Hunter-Schmidt random effects

Pooled correlation = .125 (95% CI = 0.183 to 0.196)

Z (test Correlation) = 4.177 P < 0.001

Since the p<.001 is less than the 5% level of significance, we reject the null hypothesis the individual-specific effects are uncorrelated with the independent variable and conclude at a 5% confidence interval that there is a correlation between individual-specific effects and the independent variable.

There exist a weak correlation between overconfidence and innovation according to the pooled correlation coefficient of 0.125. It follows that an increase in risk leads to a corresponding increase in innovation, which is significant as the confidence interval does not contain zero.

Bias indicators

Begg-Mazumdar: Kendall's tau = 0.00 P = 0.9049 (low power)

Egger: bias = .0031 (95% CI = .118 to .133) P < .001

The Egger's test gave a p-value of .p<0.001, a value less than the 5% significance level. It follows that we reject the null hypothesis of no publication bias and conclude at 5% level of significance that there existed publication bias in the study.
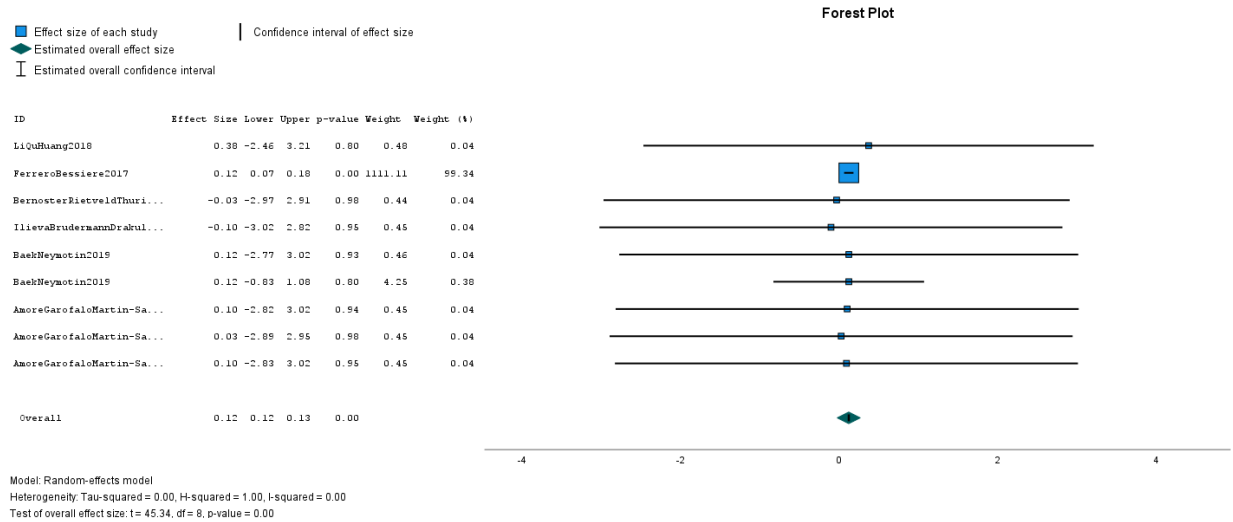
Observed variance across studies: 0.0031

Variance due to sampling error: 0.0347

Variance in the population correlations: 0.013146

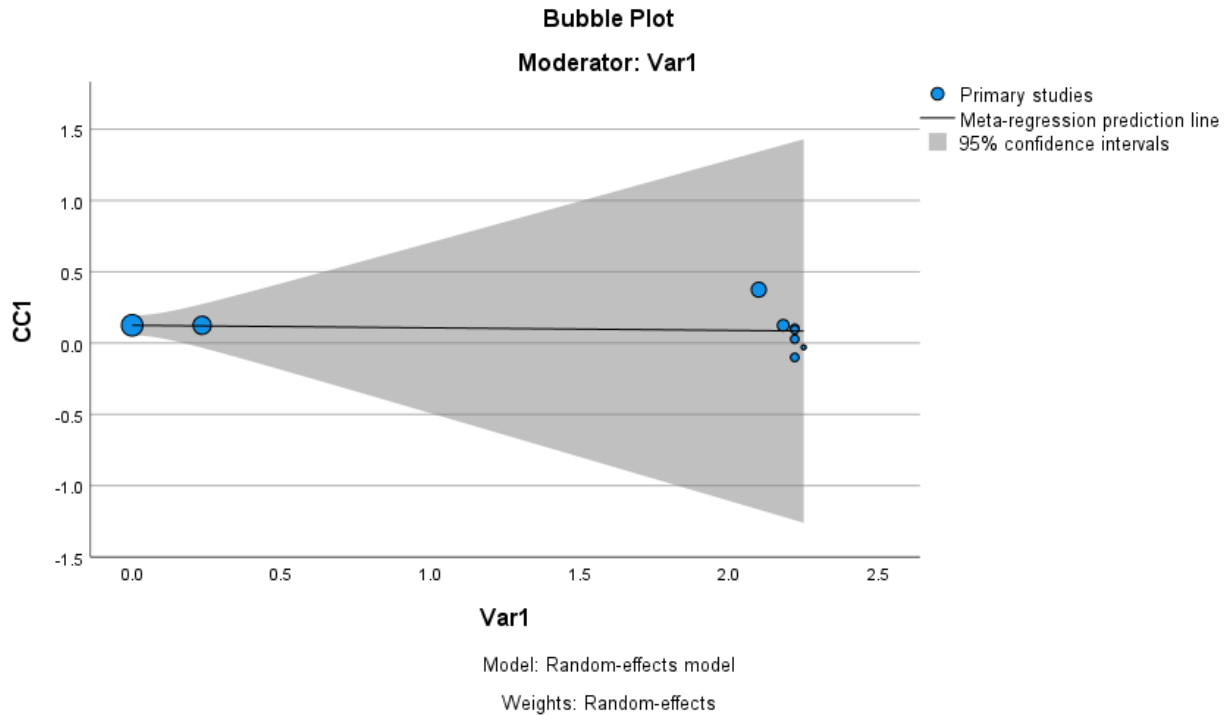95% Credibility interval for weighted mean correlation: 0.14954 to 0.598984

Forest plot

Forest Plot

ID	Effect Size	Lower	Upper	p-value	Weight	Weight (%)
LiQuHuang2018	0.38	-2.46	3.21	0.80	0.48	0.04
FerreroBessiere2017	0.12	0.07	0.18	0.00	1111.11	99.34
BernosterRietveldThuri...	-0.03	-2.97	2.91	0.98	0.44	0.04
IlievaBrudermannDrakul...	-0.10	-3.02	2.82	0.95	0.45	0.04
BaekNeymotin2019	0.12	-2.77	3.02	0.93	0.46	0.04
BaekNeymotin2019	0.12	-0.83	1.08	0.80	4.25	0.38
AmoreGarofaloMartin-Sa...	0.10	-2.82	3.02	0.94	0.45	0.04
AmoreGarofaloMartin-Sa...	0.03	-2.89	2.95	0.98	0.45	0.04
AmoreGarofaloMartin-Sa...	0.10	-2.83	3.02	0.95	0.45	0.04
Overall	0.12	0.12	0.13	0.00		

Model: Random-effects model
Heterogeneity: Tau-squared = 0.00, H-squared = 1.00, I-squared = 0.00
Test of overall effect size: t = 45.34, df = 8, p-value = 0.00

Most of the weights are equal; therefore, the forest plot indicates no heterogeneity in the study. Consequently, there is an effect since most boxes lie without zero value. The sizes of the boxes are proportionate to the weight of the study in relation to the pooled estimate. The I-squared gives the magnitude for heterogeneity. In this case, heterogeneity is unimportant since I-squared lies below 40%. The p-value is less than 0.05, therefore indicating there is a significant difference.
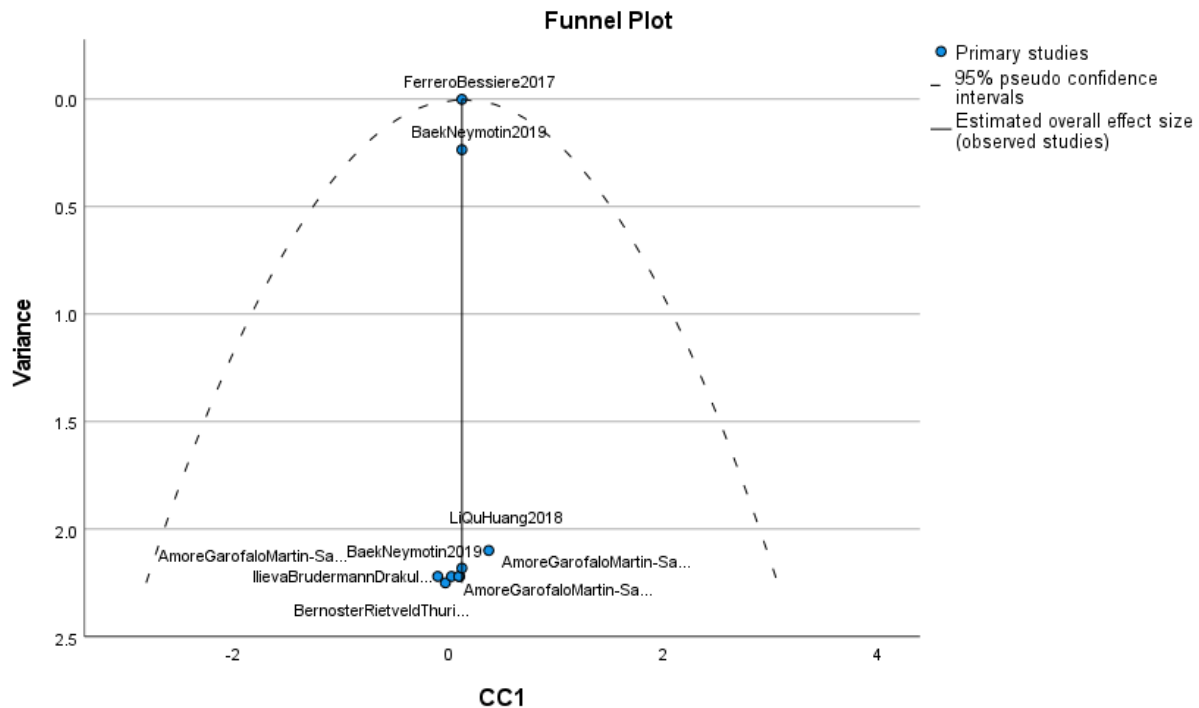
Funnel plot

Funnel Plot

Each dot in the funnel plot represents a single study. In this funnel plot above, the dots are not evenly split, and most are not at the top, indicating that the data set is not representative and there is bias. The standard errors are not the same size since the studies do not lie on the horizontal line and tend to assume the shape of a pyramid.

Bubble plot

Bubble Plot

Moderator: Var1

Model: Random-effects model

Weights: Random-effects

There is no relationship between the x and y variables since the bubbles do not follow a specific slope trend. The bubble sizes are reducing, indicating a downward trend.

Conclusion

According to the pooled correlation coefficient of 0.125, the study's findings show a weak association between overconfidence and innovation. Given that the confidence interval does not contain a zero, this indicates that as overconfidence increases, so does innovation.

6. **Meta-Analysis on association between overconfidence and performance**

Non-combinability of studies

Cochran Q = .190 (df = 25) P = 1.000

I² (inconsistency) = 0.00%

The Cochran Q value of .190 with a p-value of 1.00 implies that we do not reject the null hypothesis that the data is heterogenic and conclude that the data is considered to be heterogenic. The I-squared value of 0.0%, however, implies inconsistency within the studies.

Hunter-Schmidt random effects

Pooled correlation = -.060 (95% CI = -.103 to -.016)

t (test Correlation) = -3.379 P = .012

Since the p-value of .017 is less than the 5% level of significance, we reject the null hypothesis that individual specific effects are uncorrelated with the independent variable and conclude at a 5% confidence interval that there is a correlation between individual specific effects and the independent variable.

A weak inverse association exists between overconfidence and performance according to the pooled correlation coefficient of -.060. It follows that an increase in overconfidence leads to a decrease in performance, which is significant as the confidence interval does not contain zero.

Bias indicators

Begg-Mazumdar: Kendall's tau = 0.00 P = 0.9049 (low power)

Egger: bias = .0122 (95% CI = -.114 to -.055) P <0.001

The Egger's test gave a p-value of .p<0.001, a value less than the 5% significance level. It follows that we reject the null hypothesis of no publication bias and conclude at a 5% level of significance that there existed publication bias in the study.
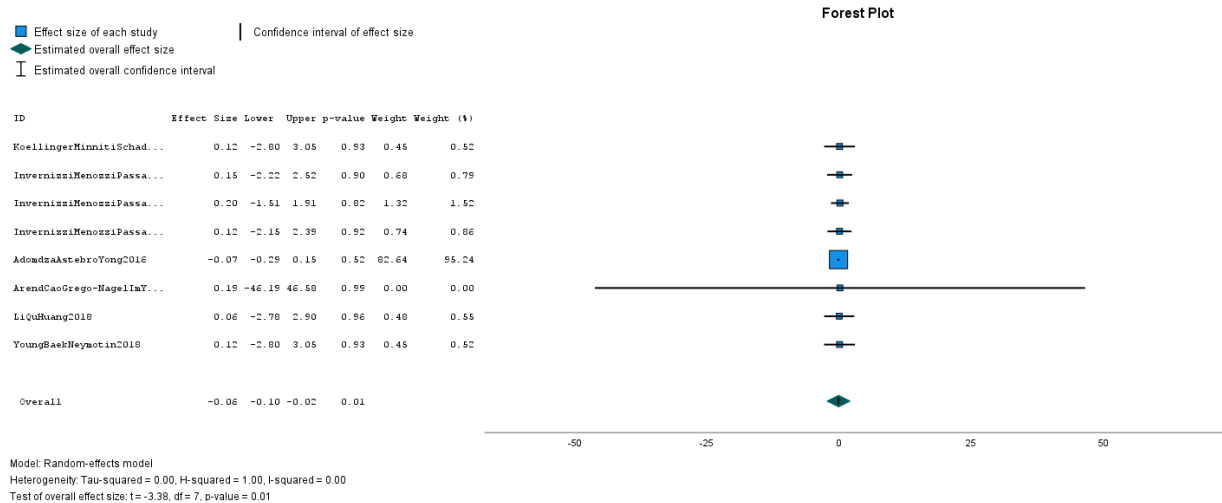

Observed variance across studies: 0.0177

Variance due to sampling error: 0.0182
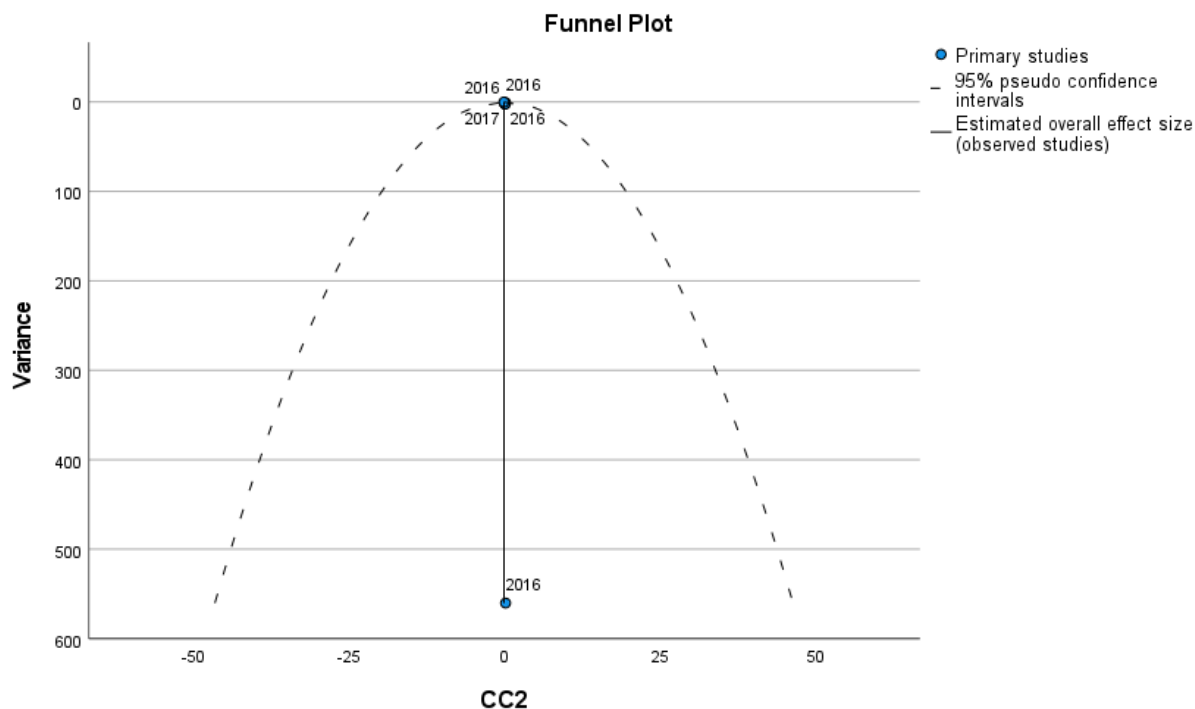
Variance in the population correlations: 0..0122

95% Credibility interval for weighted mean correlation: -.103 to -.016

Forest plot

Forest Plot

ID	Effect Size	Lower	Upper	p-value	Weight	Weight (%)
KoellingerMinnitiSchad...	0.12	-2.80	3.05	0.93	0.45	0.52
InvernizziMenozziPassa...	0.15	-2.22	2.52	0.90	0.68	0.79
InvernizziMenozziPassa...	0.20	-1.51	1.91	0.82	1.32	1.52
InvernizziMenozziPassa...	0.12	-2.15	2.39	0.92	0.74	0.86
AdomdzaAstebroYong2016	-0.07	-0.29	0.15	0.52	82.64	95.24
ArendCaoGrego-NagelImY...	0.19	-46.19	46.58	0.99	0.00	0.00
LiQuHuang2018	0.06	-2.78	2.90	0.96	0.48	0.55
YoungBaekNeymotin2018	0.12	-2.80	3.05	0.93	0.45	0.52
Overall	-0.06	-0.10	-0.02	0.01		

Model: Random-effects model
Heterogeneity: Tau-squared = 0.00, H-squared = 1.00, I-squared = 0.00
Test of overall effect size: t = -3.38, df = 7, p-value = 0.01

Most of the weights are not equal; therefore, the forest plot indicates heterogeneity in the study. Consequently, there is no effect since most boxes lie within the value zero. The sizes of the boxes are proportionate to the weight of the study in relation to the pooled estimate. The I-squared gives the magnitude for heterogeneity. In this case, heterogeneity is unimportant since I-squared lies below 40%. The p-value is less than 0.05, indicating a significant difference.

Funnel plot

Each dot in the funnel plot represents a single study. In this funnel plot above, the dots are evenly split, and most are at the top, indicating that the data set is representative and there is no bias. The standard errors are the same size since the studies lie on the horizontal line and do not tend to assume the shape of a pyramid.

Bubble plot

Bubble Plot

Moderator: Var2

Model: Random-effects model

Weights: Random-effects
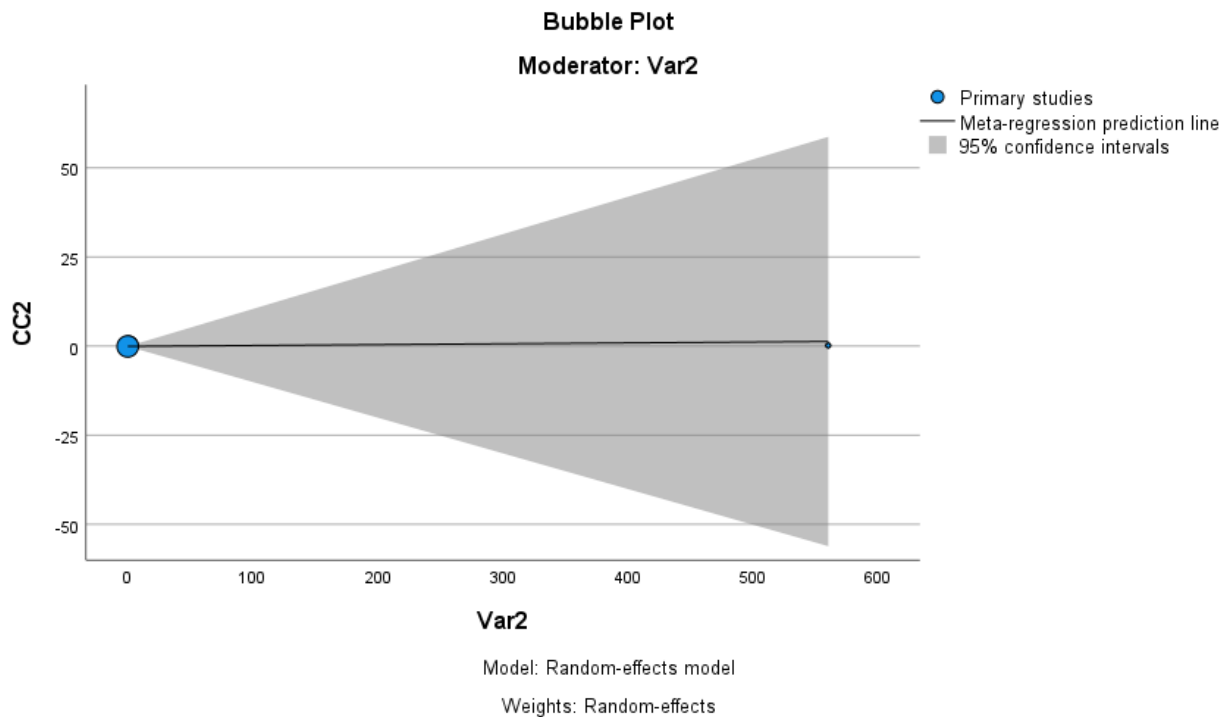
There is no relationship between the x and y variables since the bubbles do not follow a specific slope trend. The bubble sizes are reducing, indicating a downward trend.

Conclusion

In conclusion, the study established that there exist a weak inverse association exists between overconfidence and performance according to the pooled correlation coefficient of -.060. This implies that as overconfidence grows, performance reduces which is significant as the confidence interval does not contain a zero.

7. **Meta-Analysis on association between overconfidence and venture formation**

Non-combinability of studies

Cochran Q = .166 (df = 11) P = 1.000

I² (inconsistency) = 0.00%

The Cochran Q value of .166 with a p-value of 1.00 implies that we do not reject the null hypothesis that the data is heterogenic and conclude that the data is considered to be heterogenic. The I-squared value of 0.0%, however, implies inconsistency within the studies.

Hunter-Schmidt random effects

Pooled correlation = .162 (95% CI = .033 to .291)

t (test Correlation) =2.791   P = .018

Since the p-value of .018 is less than the 5% level of significance, we reject the null hypothesis the individual-specific effects are uncorrelated with the independent variable and conclude at a 5% confidence interval that there is a correlation between individual-specific effects and the independent variable.

There exist a weak direct association between overconfidence and venture formation according to the pooled correlation coefficient of 0.162. It follows that an increase in overconfidence leads to a corresponding increase in venture formation, which is significant as the confidence interval does not contain zero.

Bias indicators

Begg-Mazumdar: Kendall's tau = 0 P = 0.9049 (low power)

Egger: bias = 0 (95% CI = .033 to .291) P = .018

The Egger's test gave a p-value of .018, a value less than the 5% significance level. It follows that we reject the null hypothesis of no publication bias and conclude at a 5% level of significance that there existed publication bias in the study.
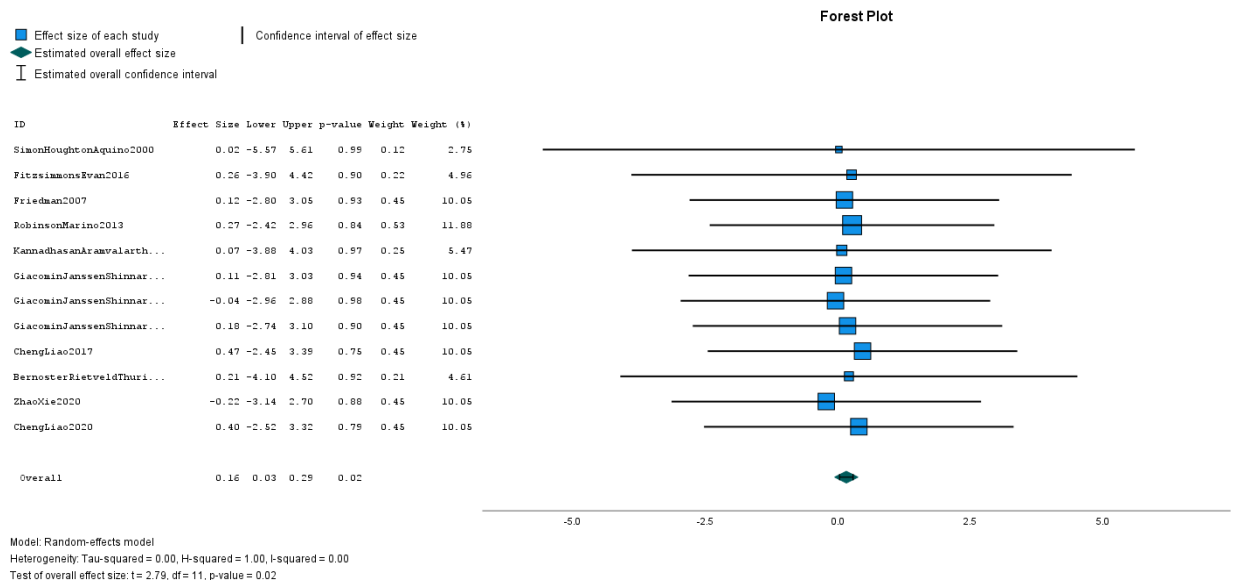
Observed variance across studies: 0.0580

Variance due to sampling error: 0.0580

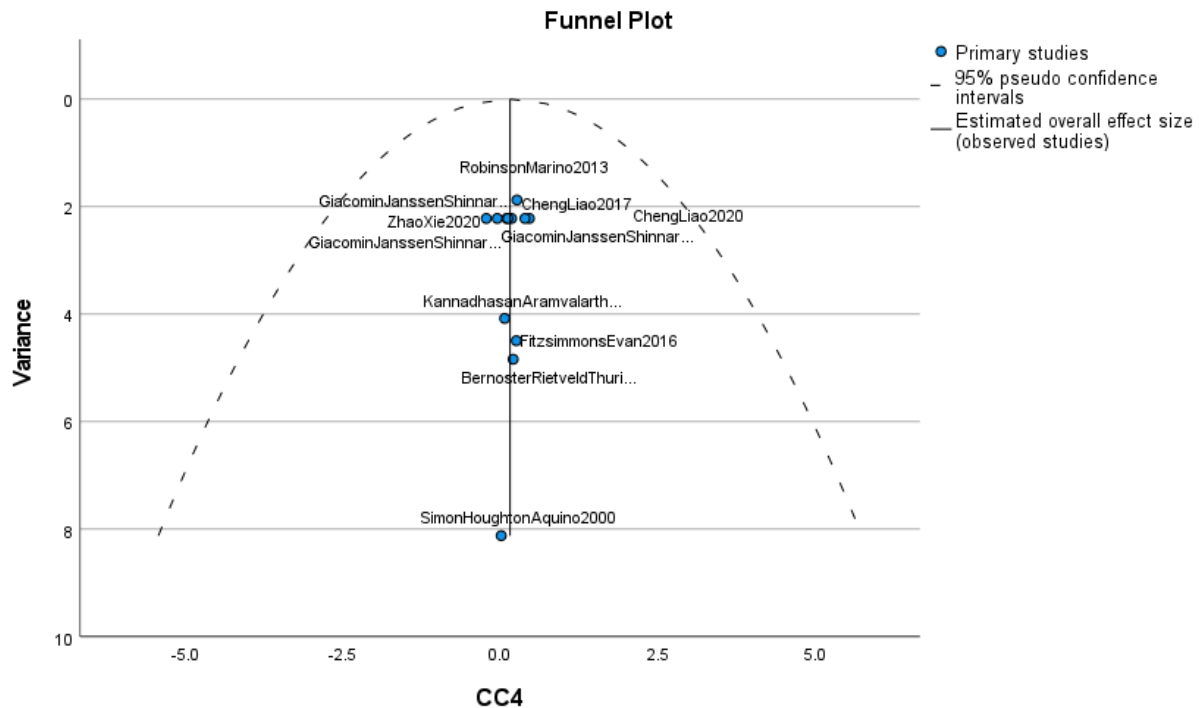Variance in the population correlations: 0.013146

95% Credibility interval for weighted mean correlation: .033 to .291
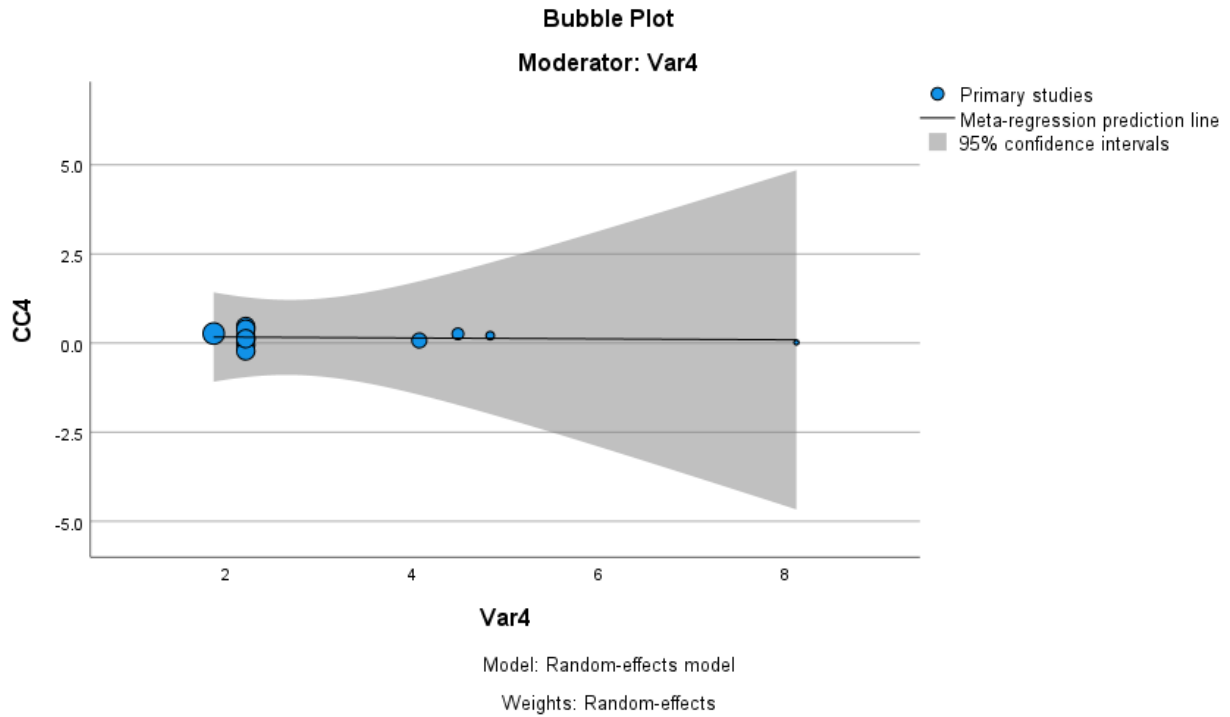
Forest plot

Most of the weights are not equal; therefore, the forest plot indicates heterogeneity in the study. Consequently, there is an effect since most boxes lie without the value zero. The sizes of the boxes are proportionate to the weight of the study concerning the pooled estimate. The I-squared gives the magnitude for heterogeneity. In this case, heterogeneity is unimportant since I-squared lies below 40%. The p-value is less than 0.05, indicating a significant difference.

Funnel plot

Funnel Plot

Each dot in the funnel plot represents a single study. In this funnel plot above, the dots are evenly split, and most are at the top, indicating that the data set is representative and there is no bias. The standard errors are not the same size since the studies do not lie on the horizontal line and do not tend to assume the shape of a pyramid.

Bubble plot

Bubble Plot

Moderator: Var4

- Primary studies
- Meta-regression prediction line
- 95% confidence intervals

Model: Random-effects model

Weights: Random-effects

There is no relationship between the x and y variables since the bubbles do not follow a specific slope trend. The bubble sizes are reducing, indicating a downward trend.

Conclusion

According to the pooled correlation coefficient of 0.162, the study's findings show that there is a marginal direct relationship between overconfidence and venture formation. This suggests that when venture creation increases, overconfidence also increases, which is crucial because the confidence interval does not contain a zero.

References

[1] Wolff, Jonathan., "Mean, Mode and Median Utilitarianism.", 2007.

[2] OOKO SILAS OWUOR, Outlier Detection Technique for Univariate Normal Datasets, Narok: Science Publishing Group, 2021.

[3] H. L. H. J. R. H. Borenstein M, Comprehensive Meta-Analysis Version 2., Englewood: NJ: Biostat 104., 2005.

[4] Hough, Susan L., and Bruce W. Hall., "A Comparison of the Glass Meta-Analytic Technique with the Hunter-Schmidt Meta-Analytic Technique on Three Studies from the Education Literature.", (1991)..

.