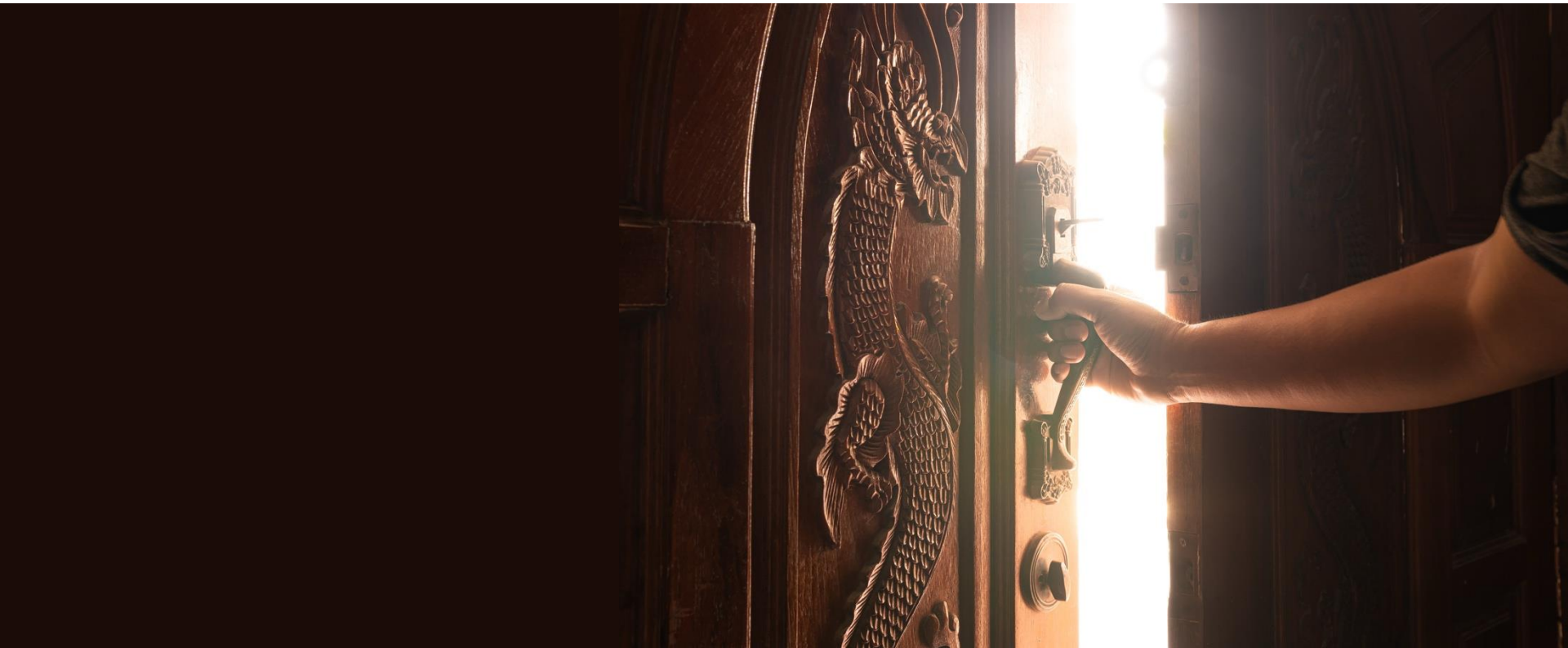


Opening Doors: Incentives and Impact of Open Science in Social Science Research



Dr. Christine Emmer
Health Psychology and MZES



Why Open Science?



Addresses the replication crisis



Shows rigor and transparency of research



Equitable access to knowledge



Facilitates collaboration



Faster, cumulative access to knowledge



Science as a *public good*



Core quality standard

How openness opened doors



Bojanovsky-Preis

Christine Emmer wurde mit dem diesjährigen Bojanovsky-Preis für ihren empirischen Artikel „**The association between weight stigma and mental health**“ ausgezeichnet. Er erschien in der renommierten Fachzeitschrift „Psychological Bulletin“. In der meta-analytischen Arbeit zeigt sie zusammen mit ihren Kolleg*innen die direkten schädlichen Auswirkungen von Diskriminierung auf die mentale Gesundheit. Die Prof. Dr. Anna- und Prof. Dr. Jörg Jiri Bojanovsky-Stiftung prämiiert den Artikel für seine Methodik und würdigt besonders die vorbildlichen Open Science Praktiken der Autorinnen, einschließlich der Präregistrierung und der offenen Bereitstellung aller Daten. Der Bojanovsky-Preis unterstützt hervorragende

Nachforschungsarbeiten, die empirische
M
is

“...especially recognized the authors’ exemplary Open Science practices — including preregistration and open data sharing.”

Review

> *Psychol Bull.* 2024 Mar;150(3):215-252. doi: 10.1037/bul0000419. Epub 2024 Feb 8.

The immediate effect of discrimination on mental health: A meta-analytic review of the causal evidence

Christine Emmer ¹, Julia Dorn ¹, Jutta Mata ¹



Review

> Psychol Bull. 2024 Mar;150(3):215-252. doi: 10.1037/bul0000419. Epub 2024 Feb 8.

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The immediate effect of discrimination on mental health: A meta-analytic review of the causal evidence

[Emmer, Christine ; Dorn, Julia ; Mata, Jutta](#)

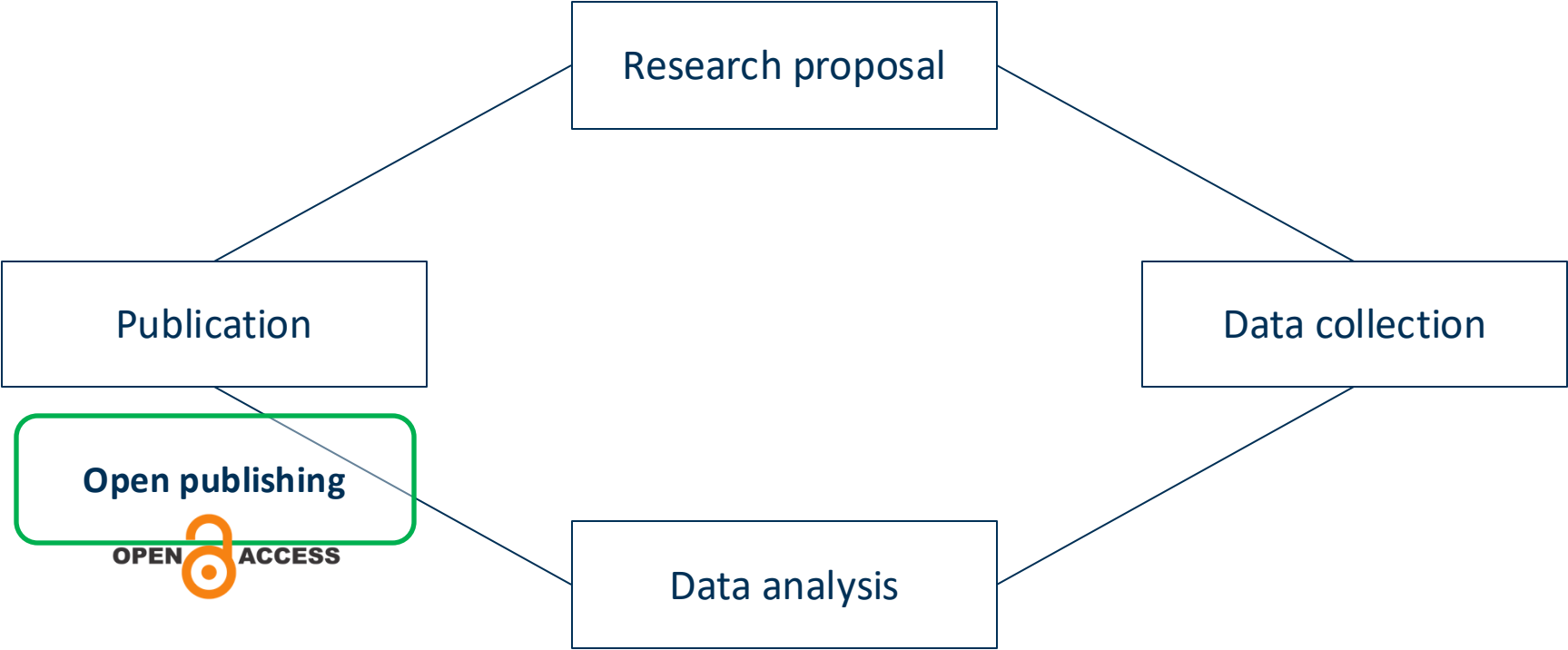


PDF
Manuscript_Emmer et al_The Immediate Effect of Discrimination on Mental Health A Meta-Analytic Review of the Casual Evidence_2024.pdf -
Accepted
[Download \(1MB\)](#)



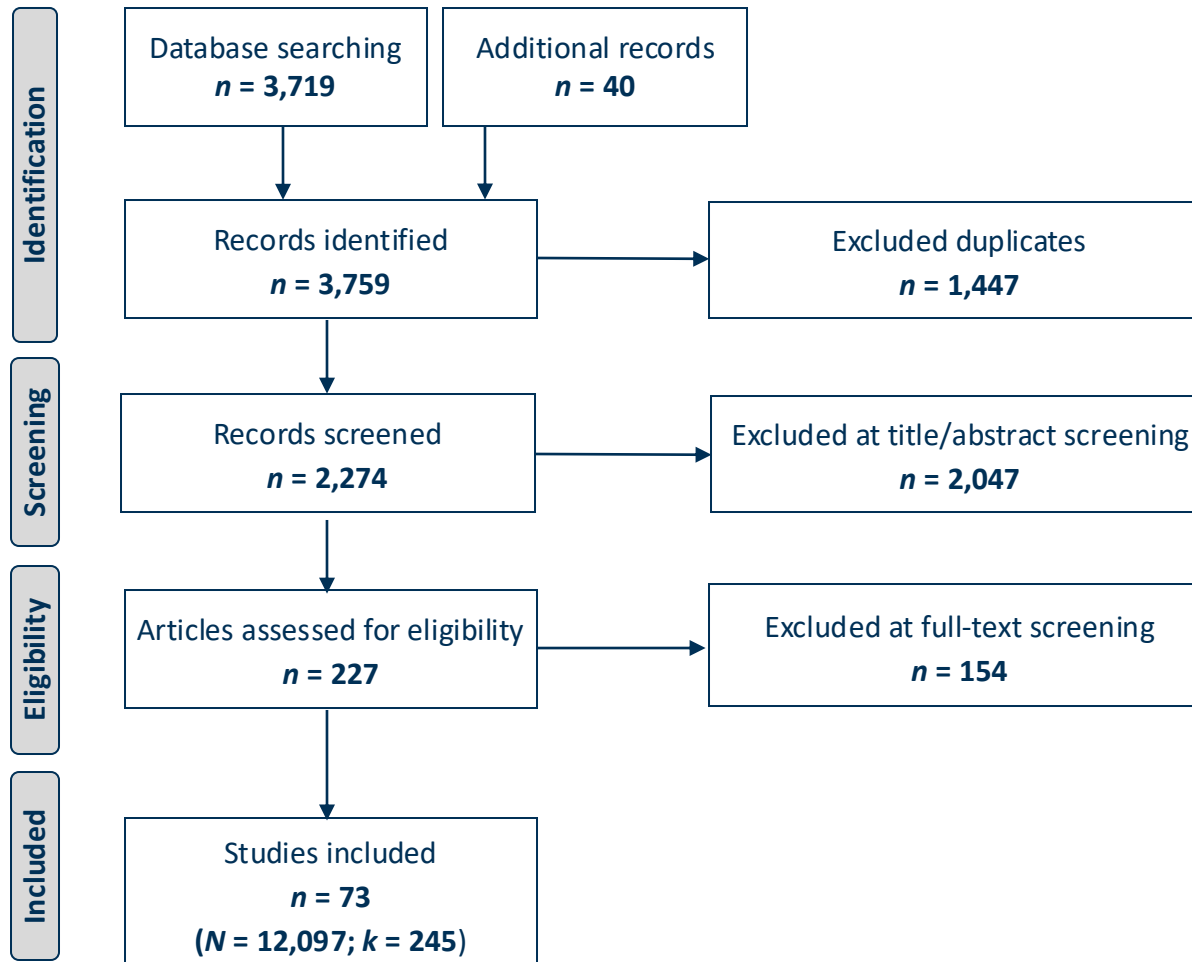
PDF
Supplemental_Material_Emmer et al_The Immediate Effect of Discrimination on Mental Health A Meta-Analytic Review of the Casual Evidence.pdf -
Accepted
[Download \(2MB\)](#)

Open Science in practice



Meta-analytic review

Systematic literature search



Preregistration

(Example OSF Preregistration)

- Study information
 - Title
 - Description
 - Hypotheses
- Design plan
 - Study type
 - Blinding
 - Study design
 - Randomization
- Sampling plan
 - Existing data
 - Data collection procedures
 - Sample size
 - Stopping rule
- Variables
 - Manipulated variables
 - Measured variables
 - Indices
- Analysis plan
 - Statistical models
 - Transformations
 - Data exclusions
 - Missing data
 - Exploratory analysis
- Other

Deviations from preregistration are not a problem!

- What matters is to report them transparently and systematically
- Templates, e.g.,
 - Lakens, 2024: <https://doi.org/10.1525/collabra.117094>
 - Willroth & Atherton, 2024:
<https://doi.org/10.1177/25152459231213802>
- *Transparency and Openness* section

Method

Transparency and Openness

The reporting of this meta-analysis is in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement (Moher et al., 2015). To minimize the risk of bias, we developed a research protocol and preregistered the meta-analysis as part of an Open Science project before data extraction and analysis. The preregistration, meta-analytic analysis code, and extracted data are available at <https://osf.io/5fqa2/>. Please note the following deviations of this meta-analysis from the preregistration: During the revision process, Hypothesis 3—group status as moderator of the mental health effect of discrimination—was added. This hypothesis was not part of the preregistration because the preregistration was focused solely on discrimination against marginalized identities excluding discrimination operationalized as unfair treatment based on nonmarginalized identities. Additionally, the preregistered exploratory analyses on coping strategies and ethnicity could not be conducted due to insufficient variability between samples. To enhance the stringency and clarity of our analyses, these exploratory analyses were excluded from the article. Furthermore, the preregistered p -curve analysis could not be carried out because p -curve estimates are not robust in the presence of substantial heterogeneity as found in this meta-analysis and might produce biased results (Cooper et al., 2019). To date, there is yet no alternative selection model in the case of substantial between-study heterogeneity (see review by Rodgers & Pustejovsky, 2021).

Learning Open Science

Abschlussarbeiten

+ Informationen zur Vergabe von Abschlussarbeiten

- Bachelorarbeiten

- Bitte geben Sie ein Exposé in Form einer offline Prä-Registrierung der geplanten Studie bei der Betreuerin der Arbeit ab. Das Exposé sollte dabei den theoretischen Hintergrund, (500-1000 Wörter), die Hypothesen und deren Herleitung sowie den methodischen Ansatz der geplanten Studie und Auswertung beinhalten. Nutzen Sie hierfür bitte die auf unserer Webseite verlinkten Vorlagen und planen Sie ausreichend Zeit für die Korrektur beziehungsweise Rückmeldung ein.
- Bitte nutzen Sie zur Strukturierung des Exposé folgende Vorlage (PDF, 75 kB). Die Template ist auf Englisch geschrieben, Sie können das Exposé aber auf Deutsch oder Englisch abgeben. Bitte planen Sie ausreichend Zeit für die Korrektur beziehungsweise Rückmeldung ein. Das Exposé sollte 3–5 Seiten (exklusive Referenzen) umfassen.

Preregistration – Own data collection (Vorlage: OSF)

Name:
E-Mail:
Date:

Please note that you can submit the exposé and the thesis in **English** as well as in **German**.

Introduction

Rationale: Shortly describe the relevance and theoretical framework of your study (500-1,000 words).

Research questions: Please outline the aims of the study and research questions derived from the study rationale that will inform the methodology and analyses.

Hypotheses: For each of the research questions listed in the previous section, provide one or multiple specific and testable hypotheses (e.g., H1, H2a, H2b, ...). A figure or table may be helpful to describe complex interactions.

Exploratory research questions (optional, e.g., E1, E2, ...)

Preregistration – Systematic review (Vorlage: PROSPERO)

Name:
E-Mail:
Date:

Please note that you can submit the exposé and the thesis in **English** as well as in **German**.

Introduction

Rationale: Shortly describe the relevance and theoretical framework of your study (500-1,000 words).

Review questions: Please list each research question included in this study derived from the study rationale. Review questions may be specific or broad. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS (see, e.g., [Huang et al., 2006](#)) where relevant.

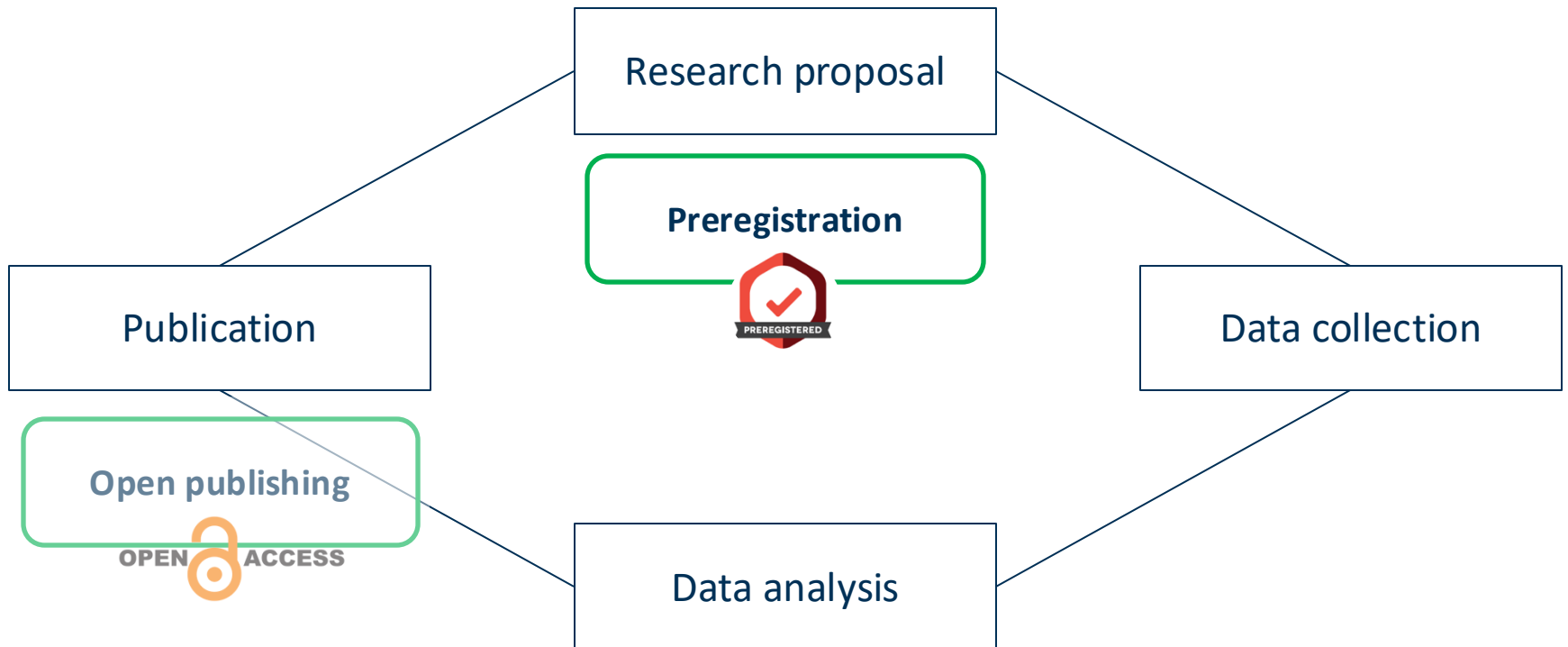
Hypotheses: For each of the research questions listed in the previous section, provide one or multiple specific and testable hypotheses (e.g., H1, H2a, H2b, ...). A figure or table may

Registered reports

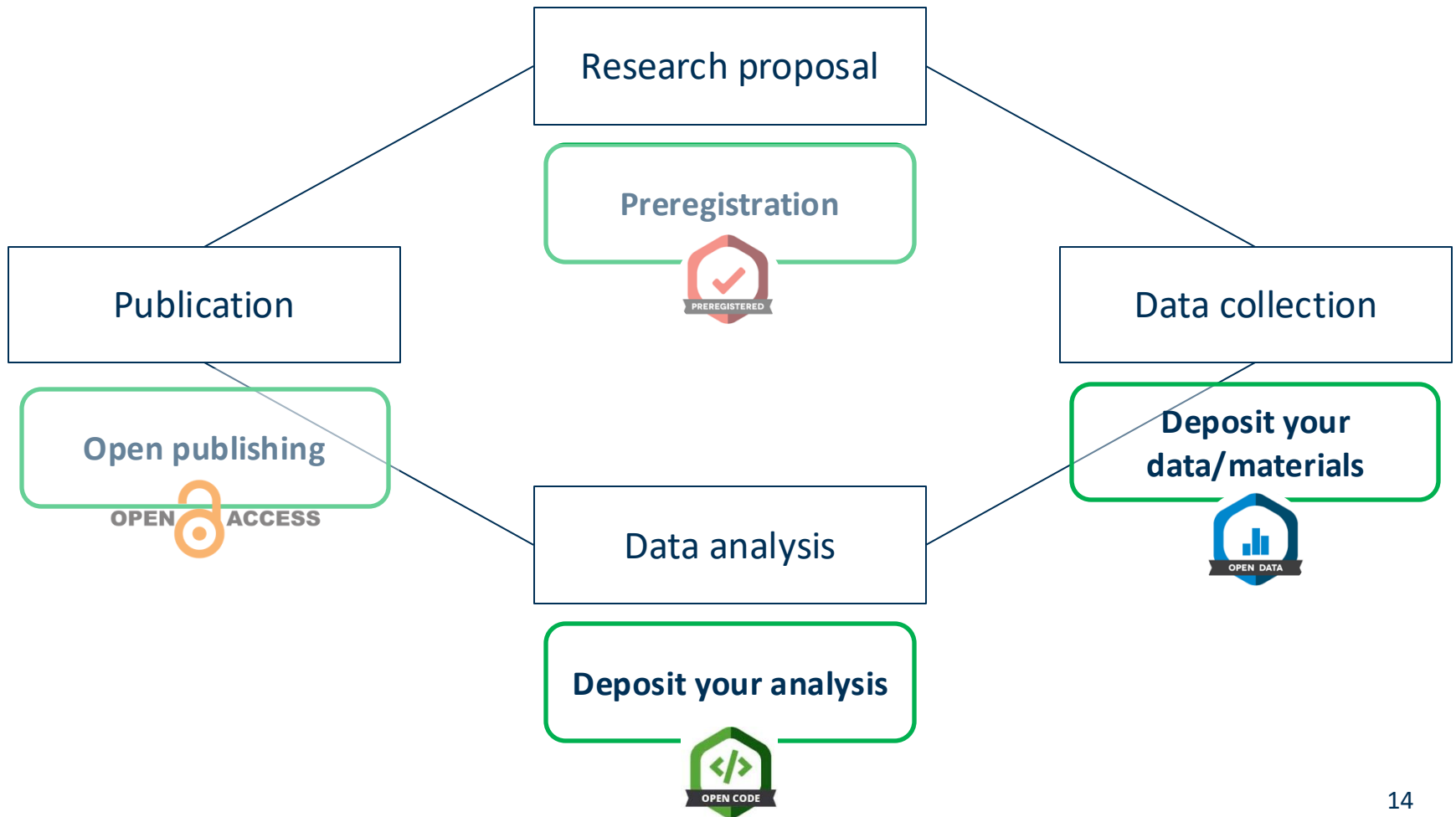
- Peer review before results are known to align scientific values and practices (e.g., Center for Open Science)
- Overview of participating journals (and more info):



Open Science in practice



Open Science in practice



Community Augmented Meta-Analysis (CAMA)



PsychOpen CAMA



zpid[®]
Leibniz-Institut für
Psychologie

https://cama.psychopen.eu/inspection/CAMA_Discrim

Data Inspection

Select domain	Health Psychology	▼
Select dataset	Discrimination and Mental Health	▼

Original publication	Emmer, C, Dorn, J, Mata, J. The Immediate Effect of Discrimination on Mental Health: A Meta-Analytic Review of the Causal Evidence. Psychological Bulletin 2023
Doi	https://doi.org/10.1037/bul0000419
Data provider	Christine Emmer
Research question	What is the experimental effect of discrimination on mental health?
Further documentation	documentation for this dataset
dataset & codebook	PsychArchives

Filter

report_ID	study_ID	sample_ID	outcome_ID	r_year	r_peer	r_author	s_meanage	s_female	s_ethnicity	t_design	s_region	s_education	s_groupstatus	o_n	o_g
1	1	1	1	2021	yes	Arriola et al.	52.83	60	0	Experimental/Random	North America	Less than 50% certain	Historically disadvantaged	52	-0.237563819095477
2	2	2	2	2020	no	Blume	24.1	61.8	0	Experimental/Random	North America	Less than 50% certain	Historically disadvantaged	207	-0.357784615384615
2	2	2	3	2020	no	Blume	24.1	61.8	0	Experimental/Random	North America	Less than 50% certain	Historically disadvantaged	207	-0.258350183150183
3	3	3	4	2019	yes	Chavez et al.	20.7	82.93	0	Experimental/Random	North America	University students	Historically disadvantaged	188	0.21821534320323
3	3	3	5	2019	yes	Chavez et al.	20.7	82.93	0	Experimental/Random	North America	University students	Historically disadvantaged	188	-0.371095558546433
3	3	3	6	2019	yes	Chavez et al.	20.7	82.93	0	Experimental/Random	North America	University students	Historically disadvantaged	188	-0.05985733512786
3	3	3	7	2019	yes	Chavez et al.	20.7	82.93	0	Experimental/Random	North America	University students	Historically disadvantaged	188	-0.0490013458950202
4	4	4	8	2020	yes	Cheng	65.67	55.25	0	Experimental/Random	Asia	Less than 50% certain	Historically disadvantaged	76	-0.566974915254237
5	5	5	9	2012	yes	Cunningham et al.	20.53	100	76.2	Experimental/Random	North America	University students	Historically disadvantaged	33	-1.06185365853659

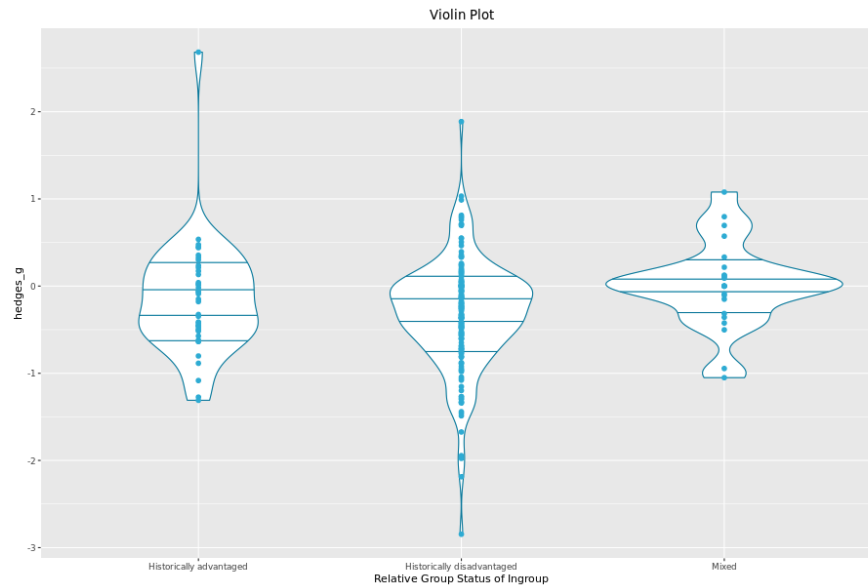
Showing 1 to 245 of 245 entries

Data Exploration

Select domain	Health Psychology	▾
Select dataset	Discrimination and Mental Health	▾
Select effect size type	hedges_g	▾

Select Moderators:

- Peer-reviewed
- Overall Study Quality (DIAD Score)
- Publication Year
- Region of Data Collection
- Mean Age of Sample
- Proportion of Individuals Identifying as Female
- Proportion of Individuals Identifying as White
- Education Level Sample
- Intergroup Context of Discrimination
- Social Setting of Discrimination
- Relative Group Status of Ingroup
- Manipulation Type
- Research Paradigm
- Type of Discrimination Exposure
- Target of Discrimination
- Manipulation Check Reported
- Mental Health Outcome Type
- Mental Health Outcome Measurement



The Violinplot depicts the probability density of the effect size of the meta-analysis for each group of the categorical moderator.

Basic Analyses

Select domain	Health Psychology	▾
Select dataset	Discrimination and Mental Health	▾
Select effect size type	hedges_g	▾

Select Moderators:

- Peer-reviewed
- Overall Study Quality (DIAD Score)
- Publication Year
- Region of Data Collection
- Mean Age of Sample
- Proportion of Individuals Identifying as Female
- Proportion of Individuals Identifying as White
- Education Level Sample
- Intergroup Context of Discrimination
- Social Setting of Discrimination
- Relative Group Status of Ingroup
- Manipulation Type
- Research Paradigm
- Type of Discrimination Exposure
- Target of Discrimination
- Manipulation Check Reported
- Mental Health Outcome Type
- Mental Health Outcome Measurement

Update View

RMA Model

Forest Plot

Cumulative Forest Plot

Multivariate Meta-Analysis Model (k = 245; method: REML)

logLik	Deviance	AIC	BIC	AICc
-208.6670	417.3340	423.3340	433.8255	423.4340

Variance Components:

	estim	sqrt	nlvs	fixed	factor
sigma^2.1	0.1624	0.4030	245	no	outcome_ID
sigma^2.2	0.1183	0.3439	73	no	report_ID

Test for Heterogeneity:

Q(df = 244) = 2183.5802, p-val < .0001

Model Results:

estimate	se	zval	pval	ci.lb	ci.ub
-0.2956	0.0536	-5.5150	<.0001	-0.4007	-0.1906 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The output on the left shows the results of the Multilevel Random Effects Meta-Analysis for k effect sizes. K is the number of effect sizes in the meta-analysis. In the multilevel model, the dependencies in effect sizes due to emerging from the same sample or report are considered. The information given for this model is interpreted as follows:

logLik, Deviance

Deviance statistics are useful to compare a bigger model to a smaller model, nested in the bigger one (certain coefficients in the bigger model are set 0). It is hypothesized, that the coefficients of the additional predictors in the bigger model are 0, that means no improvement of the model due to these predictors.

The likelihood is a measure for the goodness of fit of a model to the data provided by a sample. The deviance statistic used for model testing is derived from the LogLikelihood of the model:

$$\text{Deviance} = -2 * (\text{LogLike}(\text{smaller model}) - \text{LogLike}(\text{bigger model}))$$

Smaller Deviance is better. It means, that adding more predictors to a model reduces deviance and improves the model fit. The deviance statistic is used to determine whether or not the reduction in deviance is significant.

AIC, BIC, AICc

These are information criteria to compare models and evaluate their stability. The general idea of these criteria is to add deviance and a penalty term. The smaller the deviance, the better the model fits the data. The penalty term addresses the complexity of the model. As the goal is a parsimonious model explaining the data with only a few predictors, lower AIC / BIC are better.

Variance components:

In the multilevel mode, the variation attributed to each analysis level is estimated. For each level, the estimated variance and the corresponding standard error are reported. Furthermore, the number of effect sizes, samples and reports in the meta-analysis is reported in column „nlvs“.

Test for heterogeneity:

Cochran Q test for statistical heterogeneity tests the null hypothesis, that the underlying true effect size parameters are the same in all studies included. The test statistic Q is chi-squared distributed on k-1 degrees of freedom under the null hypothesis. If the results are statistically significant, the null hypothesis is rejected and statistical heterogeneity is expected.

Publication Bias

Select domain	Health Psychology	▾
Select dataset	Discrimination and Mental Health	▾
Select effect size type	hedges_g	▾

Update View

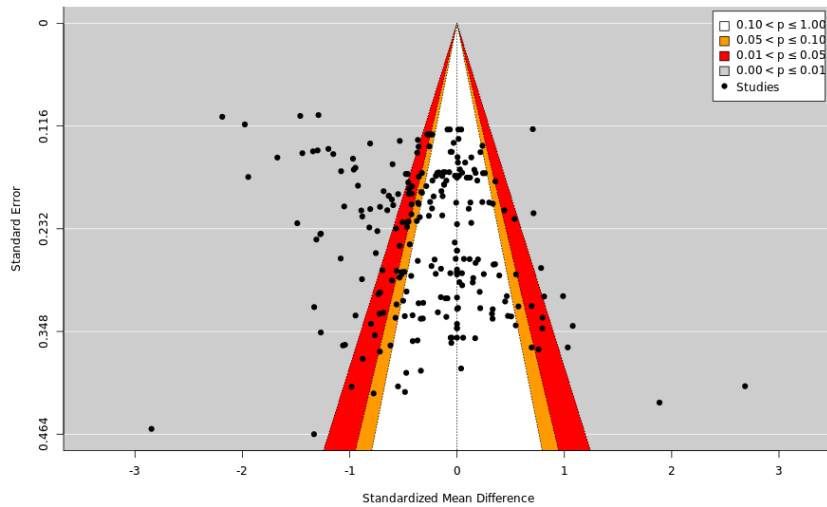
Select Option

Use peer reviewed studies only

Funnel Plot

Contour-enhanced funnel

p-curves



Power enhanced funnel plot

An enhancement to the classical funnel plot is the contour-enhanced funnel plot (Peters et al., 2008). It allows to take into account the statistical significance of the outcomes for the evaluation of potential publication bias. The contour-enhanced funnel plot is centered at 0 (null hypothesis of no effect) and the colored regions indicate different levels of statistical significance. Findings within the white region are not significant and thus, in case of a lack of small studies (with higher standard errors) in the white region, this would be an indication for publication bias, as small studies with non-significant results are expected to remain unpublished. If there is asymmetry suggesting missing studies in areas of statistical significance, publication bias is not likely to be the reason for the asymmetry.

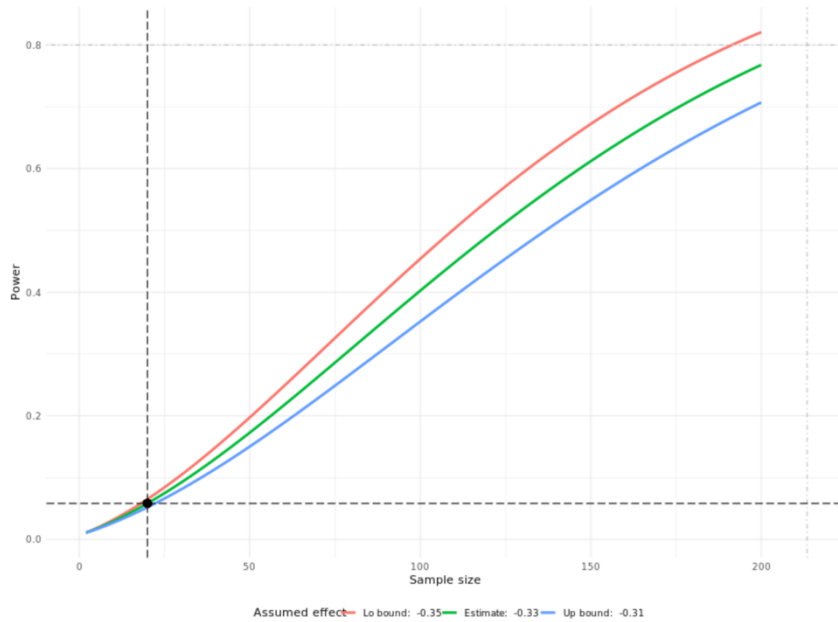
Peters, J. L., Sutton, A. J., Jones, D. R., Abrams, K. R., & Rushton, L. (2008). Contour-enhanced meta-analysis funnel plots help distinguish publication bias from other causes of asymmetry. *Journal of clinical epidemiology*, 61(10), 991–996. <https://doi.org/10.1016/j.jclinepi.2007.11.010>.

Study Planning

Select domain	Health Psychology	▾
Select dataset	Weight stigma and mental health	▾
Select effect size type	pearson_r	▾
Significance level	p=0.01	▾
Sample Size: 20	<input type="range"/>	

Update View

What-If-Analyses



Power of the single study

Interpretation: In the field of interest, a single study of a given sample size $n=20$ (x-axis) would correctly reject a false null hypothesis on the effect size of interest with a probability of 5.8 % (y-axis), assuming the meta-analytic estimate as the true underlying effect size. Thus, to achieve 80 % power for the single study, a sample size of $n=213$ (x-axis) would be needed.

The plot shows the uncertainty in the power estimation due to uncertainty about the assumed effect size. The lower and upper curve in the plot show the power estimations assuming the lower and upper bounds of the meta-analytic effect size estimation as true effect size.

Data Contribution



Share meta-analysis

Share your meta-analytic data with others to make it accessible and expandable using our data template for means of interoperability:

We have prepared [spreadsheets](#) for meta-analytic data. All data shared and added to PsychOpen CAMA have to be edited in the format of these spreadsheets to make our analysis scripts run with the new data.

The submission process for new data is still under development. For the time being please send your data via email to: [contact](#)



Add a study

You have conducted or found a study, that might potentially be eligible for an existing meta-analysis in PsychOpen CAMA?

Then add it to the database to support the accumulation of evidence in psychology. To this end, you can download the current version of the dataset of your choice and fill in the additional information from new trials.

Select dataset

The submission process for your edited data is still under development. For the time being please send the edited data via email to: [contact](#)

If you want to start

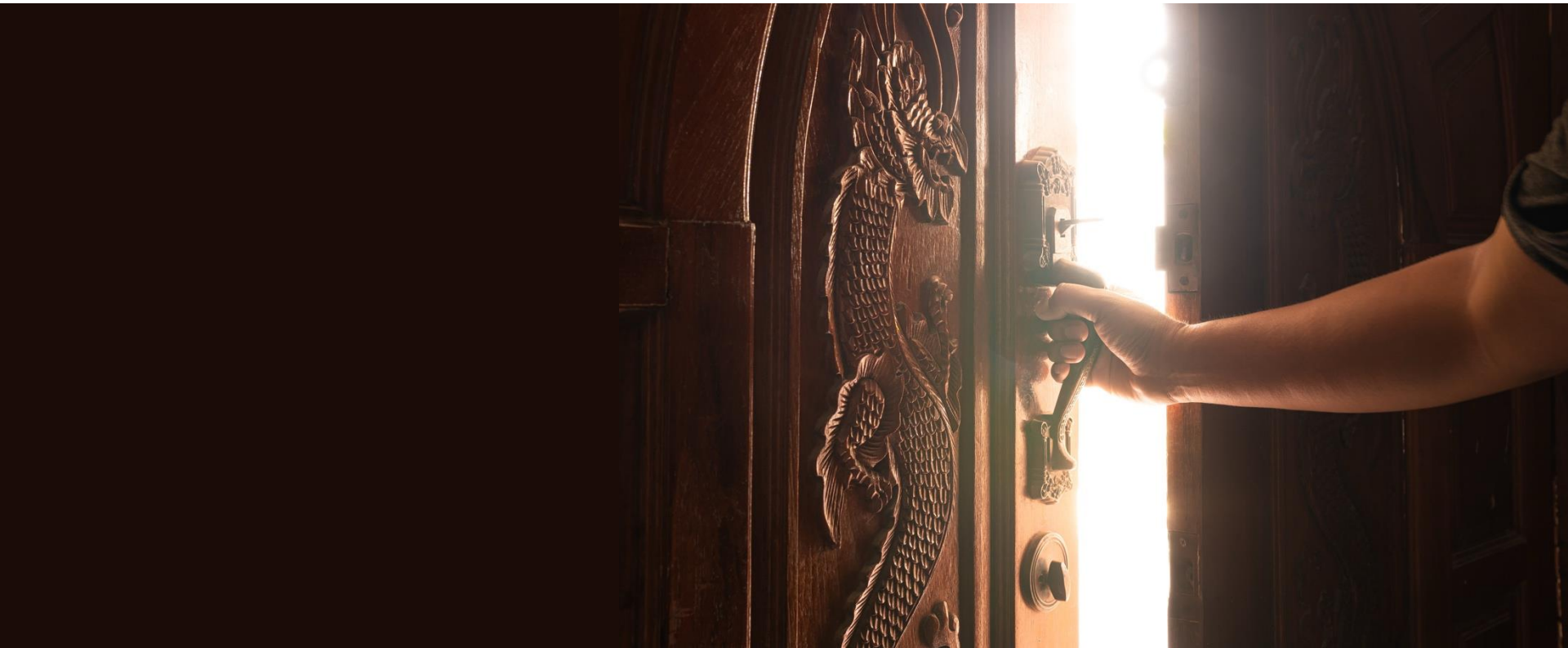
- Open Science can feel risky – but it's actually the opposite
- Deviations ≠ mistakes
- Ask questions, use support, connect (OS community is amazing)
- It might take a bit more time at first, but it quickly becomes routine
- Sharing is caring ✨ equitable research, democratizes knowledge, fosters trust
- Do not overthink – just try it! The doors are open, and it is worth it

Opening Doors: Incentives and Impact of Open Science in Social Science Research



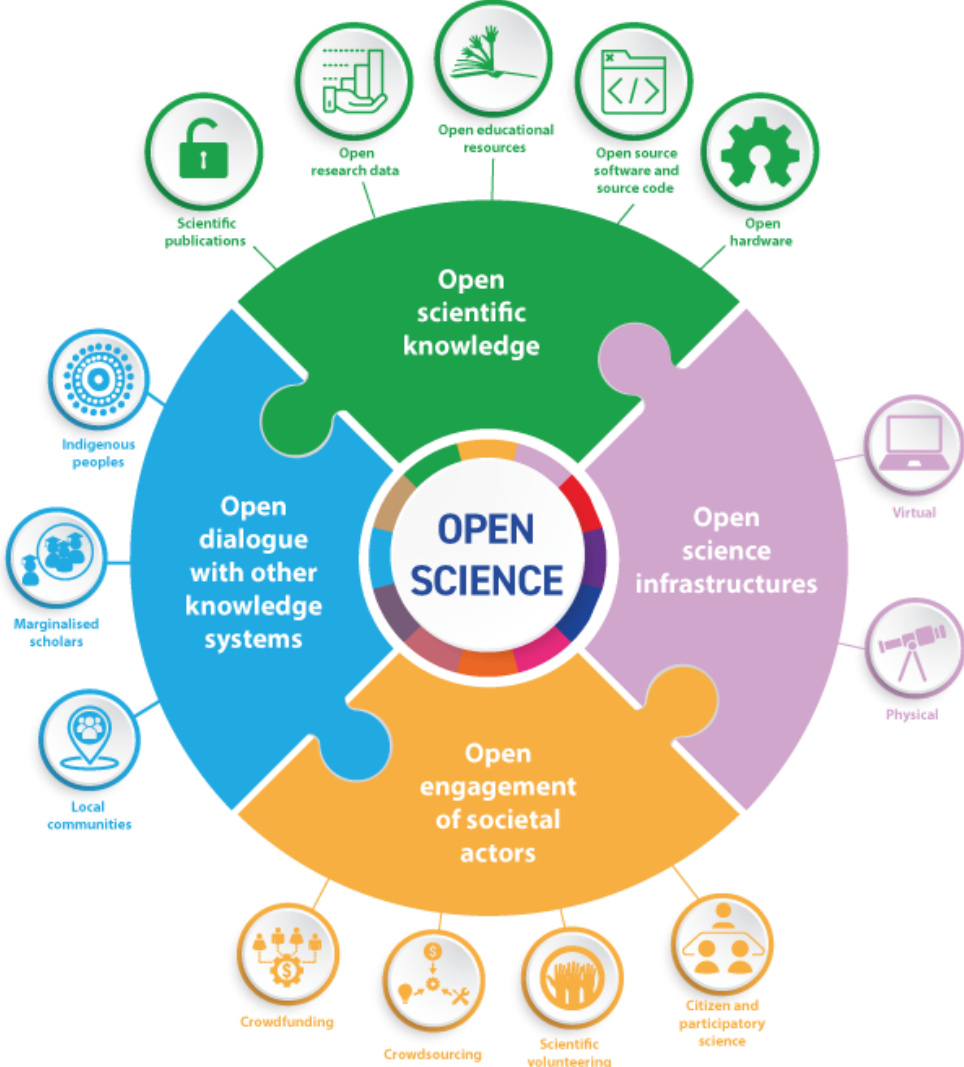
Dr. Christine Emmer

Health Psychology and MZES

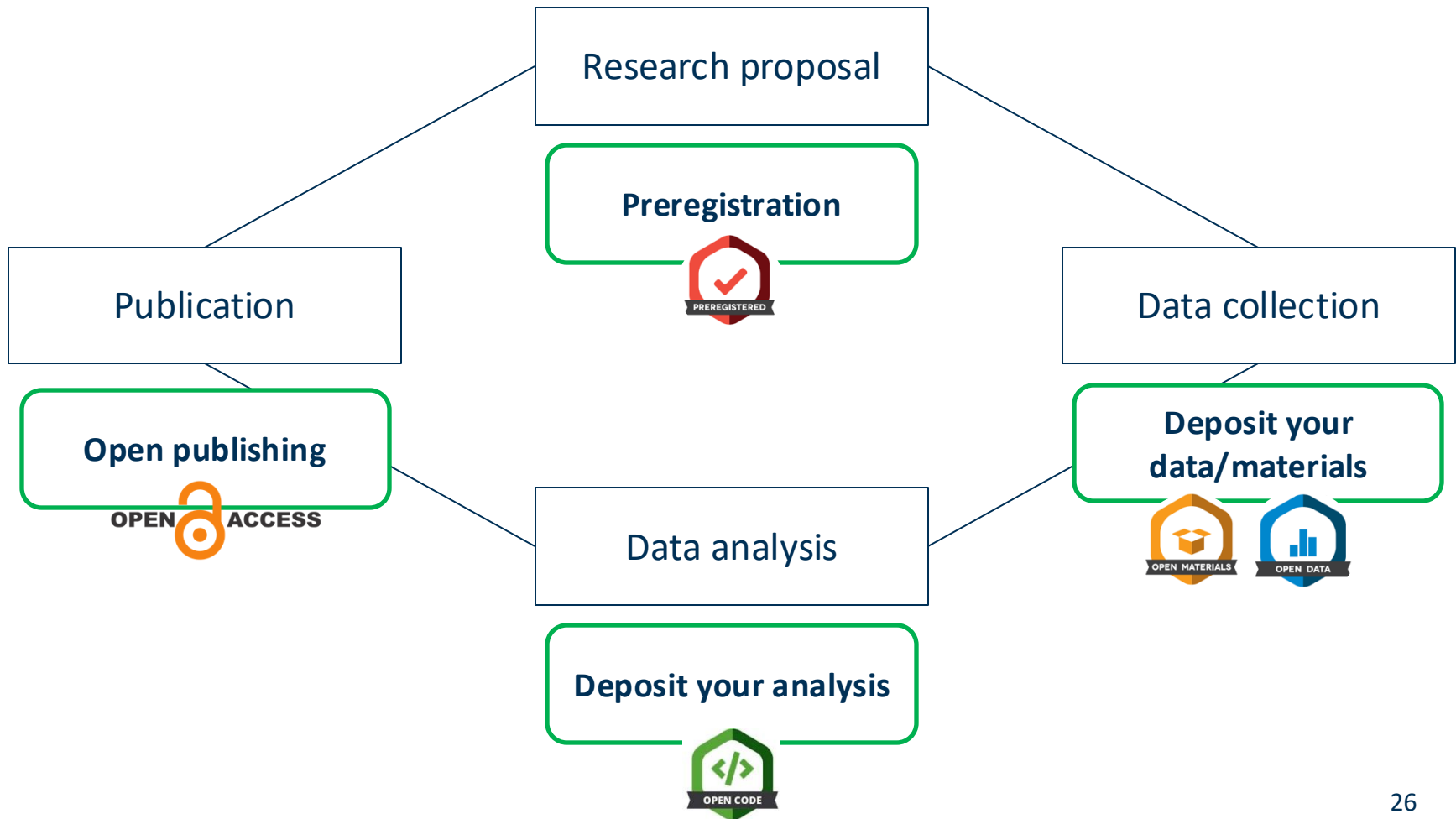


Supplements

Many ways to be open



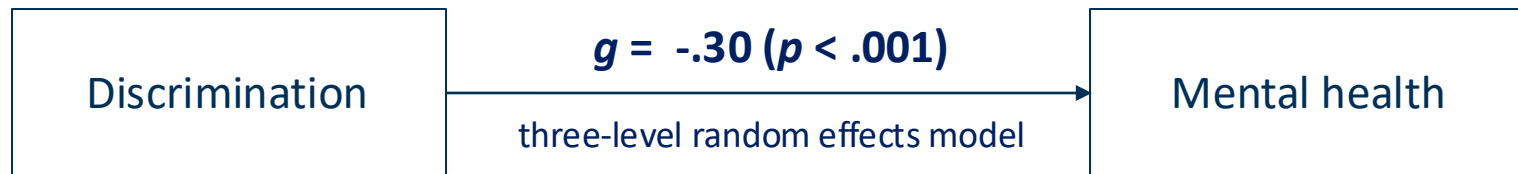
Open Science in practice





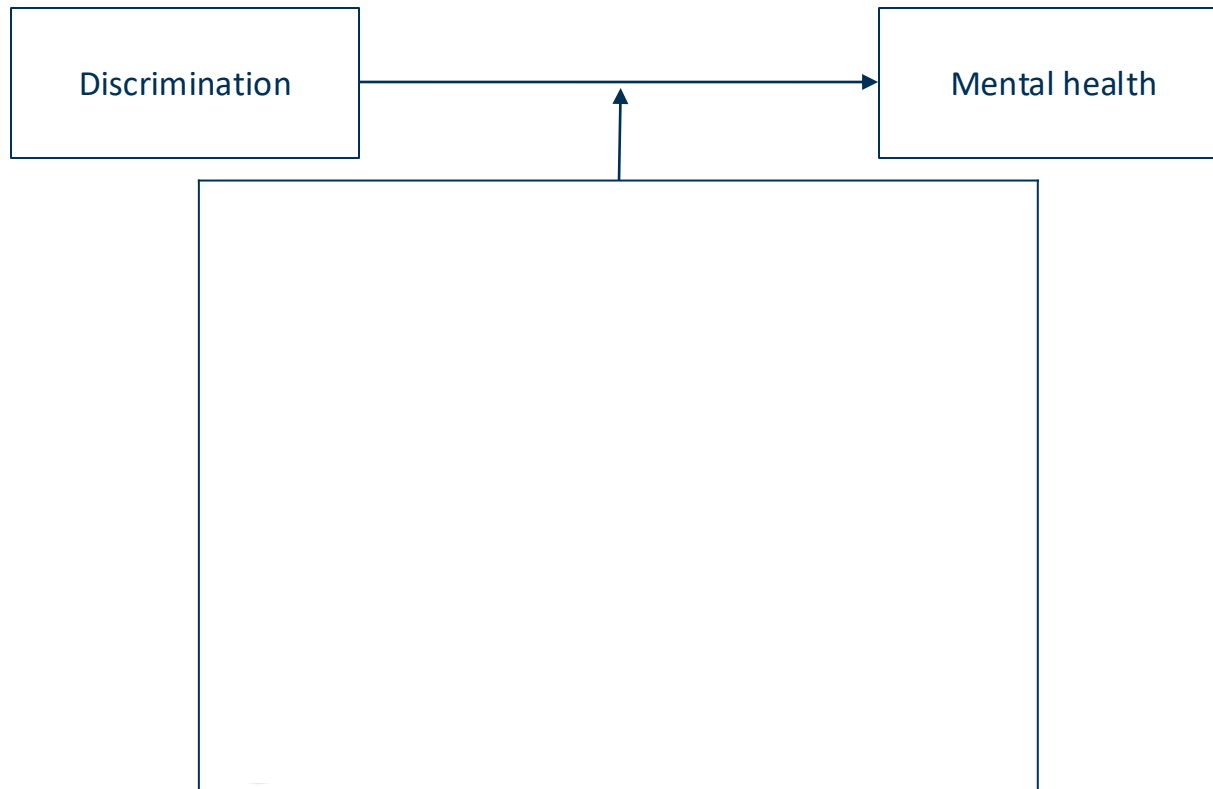
Meta-analytic review

Discrimination has a negative effect on mental health

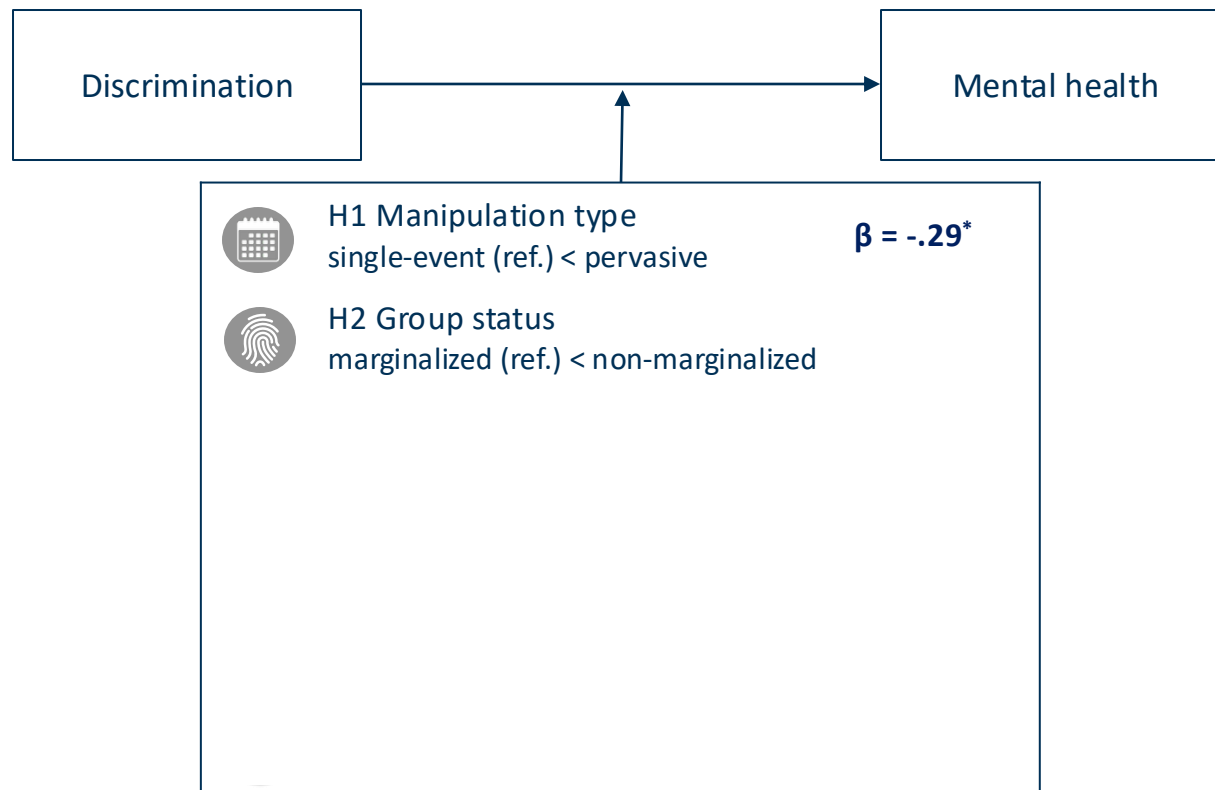


- $k = 245$ quantitative effect sizes
- $N = 12,097$ participants
- $n = 73$ experiments

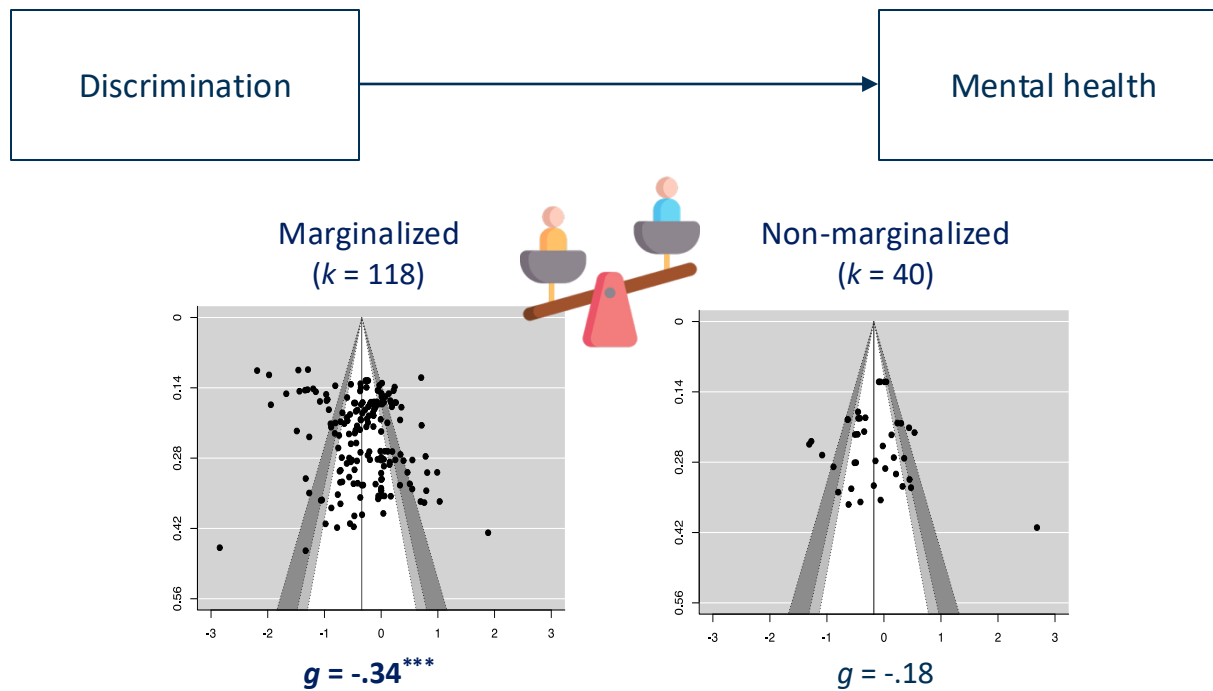
Results: Moderator analyses



Results: Moderator analyses

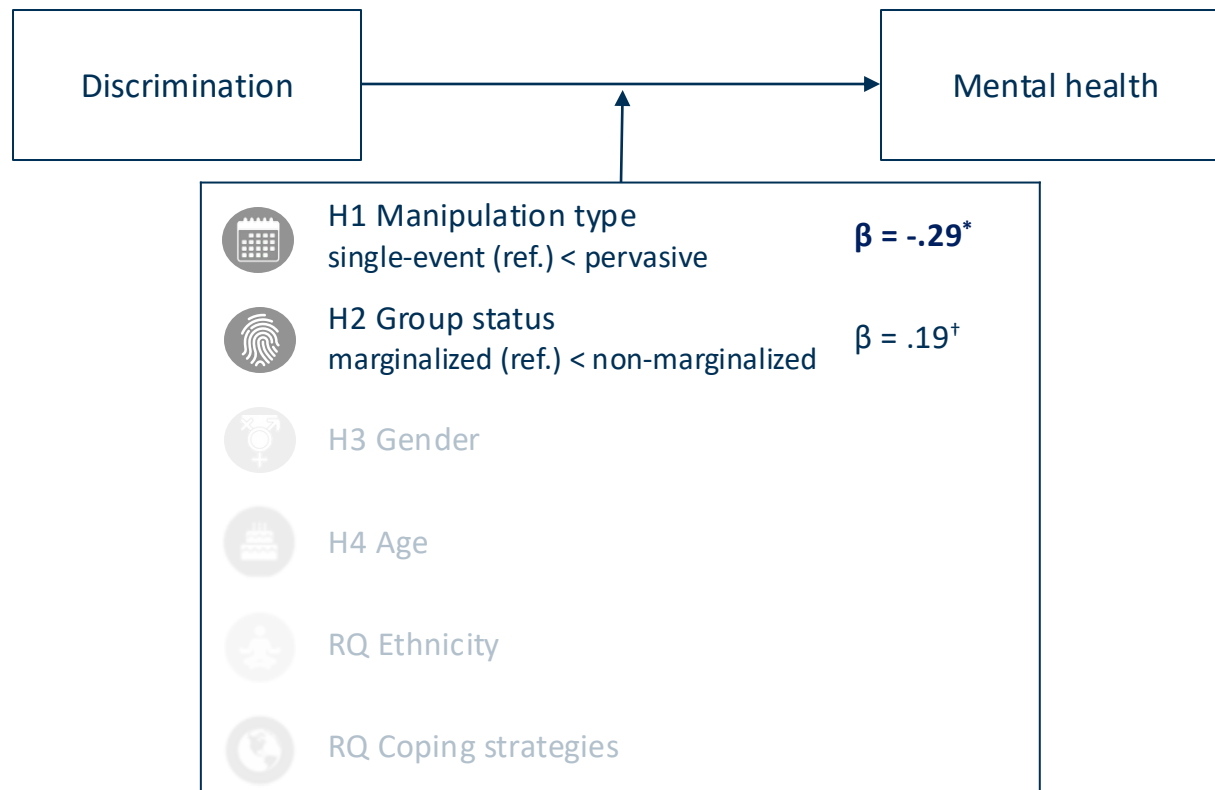


Exploratory subgroup analyses: Group status



Note. The diagonal lines represent confidence intervals of the probability that effect sizes differ from zero: white region $p > .10$, light-gray region $p = .10$ to $.05$, dark-gray region $p = .05$ to $.01$, region outside of the funnel plot $p < .01$.

Results: Moderator analyses




Exploratory subgroup analyses: Research paradigms

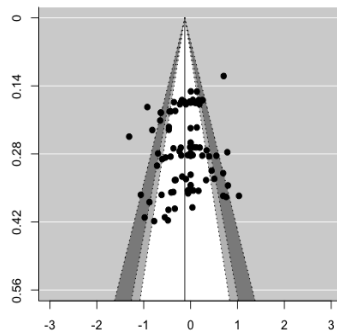


Note. The diagonal lines represent confidence intervals of the probability that effect sizes differ from zero: white region $p > .10$, light-gray region $p = .10$ to $.05$, dark-gray region $p = .05$ to $.01$, region outside of the funnel plot $p < .01$.


Exploratory subgroup analyses: Research paradigms

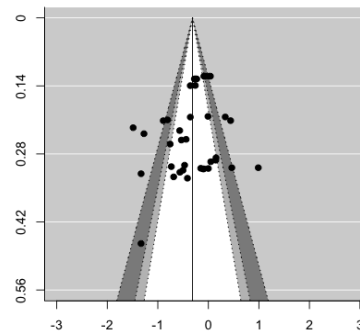



 Direct experience
($k = 94$)



$g = -.12^{\dagger}$


 Saliency induction
($k = 39$)




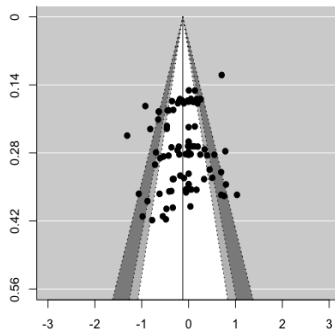
$g = -.31^{***}$

Note. The diagonal lines represent confidence intervals of the probability that effect sizes differ from zero: white region $p > .10$, light-gray region $p = .10$ to $.05$, dark-gray region $p = .05$ to $.01$, region outside of the funnel plot $p < .01$.


Exploratory subgroup analyses: Research paradigms

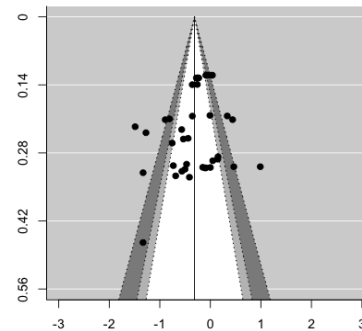


 Direct experience
($k = 94$)



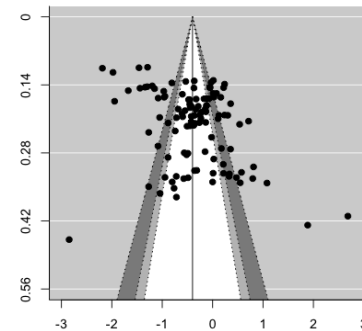
$g = -.12^{\dagger}$

 Salience induction
($k = 39$)



$g = -.31^{***}$

 Vicarious experience




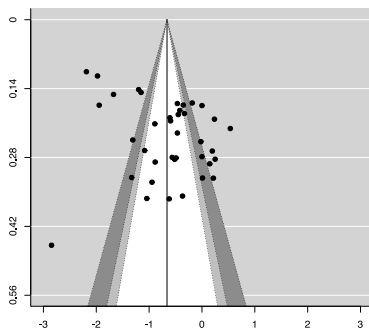
$g = -.40^{***}$

Note. The diagonal lines represent confidence intervals of the probability that effect sizes differ from zero: white region $p > .10$, light-gray region $p = .10$ to $.05$, dark-gray region $p = .05$ to $.01$, region outside of the funnel plot $p < .01$.


Exploratory subgroup analyses: Aspects of mental health

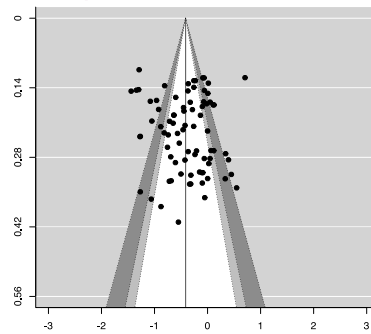


 Other-directed
($k = 38$)



$g = -.66^{***}$

 Distress-related
($k = 80$)



$g = -.41^{***}$

Note. The diagonal lines represent confidence intervals of the probability that effect sizes differ from zero: white region $p > .10$, light-gray region $p = .10$ to $.05$, dark-gray region $p = .05$ to $.01$, region outside of the funnel plot $p < .01$.