

# The Merits of Screening Automation for Bibliometric Analyses: The Case of Translational Psychotherapy

André Bittermann<sup>1</sup>, Claudiu Petrulă<sup>1</sup>, Viktoria Ritter<sup>2</sup>, Anke Haberkamp<sup>3</sup>, Winfried Rief<sup>3</sup>

<sup>1</sup> ZPID – Leibniz Institute for Psychology, Trier, Germany

<sup>2</sup> Goethe-University of Frankfurt, Dept. of Psychology

<sup>3</sup> Philipps-University of Marburg, Dept. of Psychology

**White** zebra **with black** stripes  
or **black** zebra **with white** stripes?



**Horse** or **zebra**?



## Basic Science

Conditioning  
Theory

Relational  
Frame Theory



## Psychological Intervention

Exposure  
Therapy

Acceptance and  
Commitment Therapy

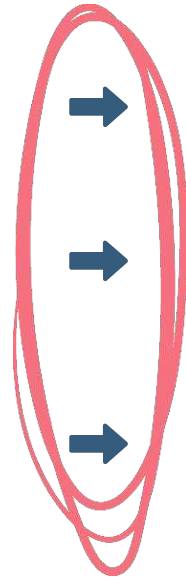
# Translational Zorse



## Basic Science

Conditioning Theory

Relational Frame Theory



## Psychological Intervention

Exposure Therapy

Acceptance and Commitment Therapy

# Translational Zorse





# Translational Zorse



Problem: **Terminology** - *'translational'*

↳ Solution: **Wider search**

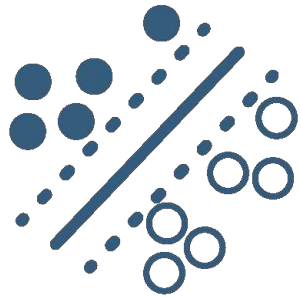
↳ Problem: **False positives**

↳ Solution: **Screening automation**

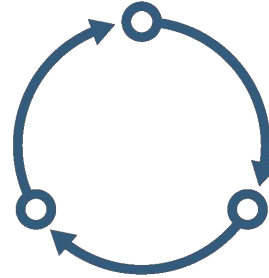
200 000 +



683



**Support  
Vector  
Machine**



**Active  
Learning**



**Inclusion  
probability of  
unreviewed  
references**

# rayyan's Inclusion Probability

Inclusion Probability  $\geq .9$  <sup>1</sup>

Active Learning Round	<i>n</i> Predicted	<i>n</i> Included	Precision
1	211	107	.51
2 <sup>2</sup>	74	74	1

<sup>1</sup> further papers with inclusion probability  $< .9 \cap \geq .7$  were included

<sup>2</sup> automatic inclusion without further screening after the second round



# Assessing the Added Value of ML

**Training Dataset** - papers found with known terminology only - '*translational*'

**Final Dataset** - papers found by leveraging Machine Learning

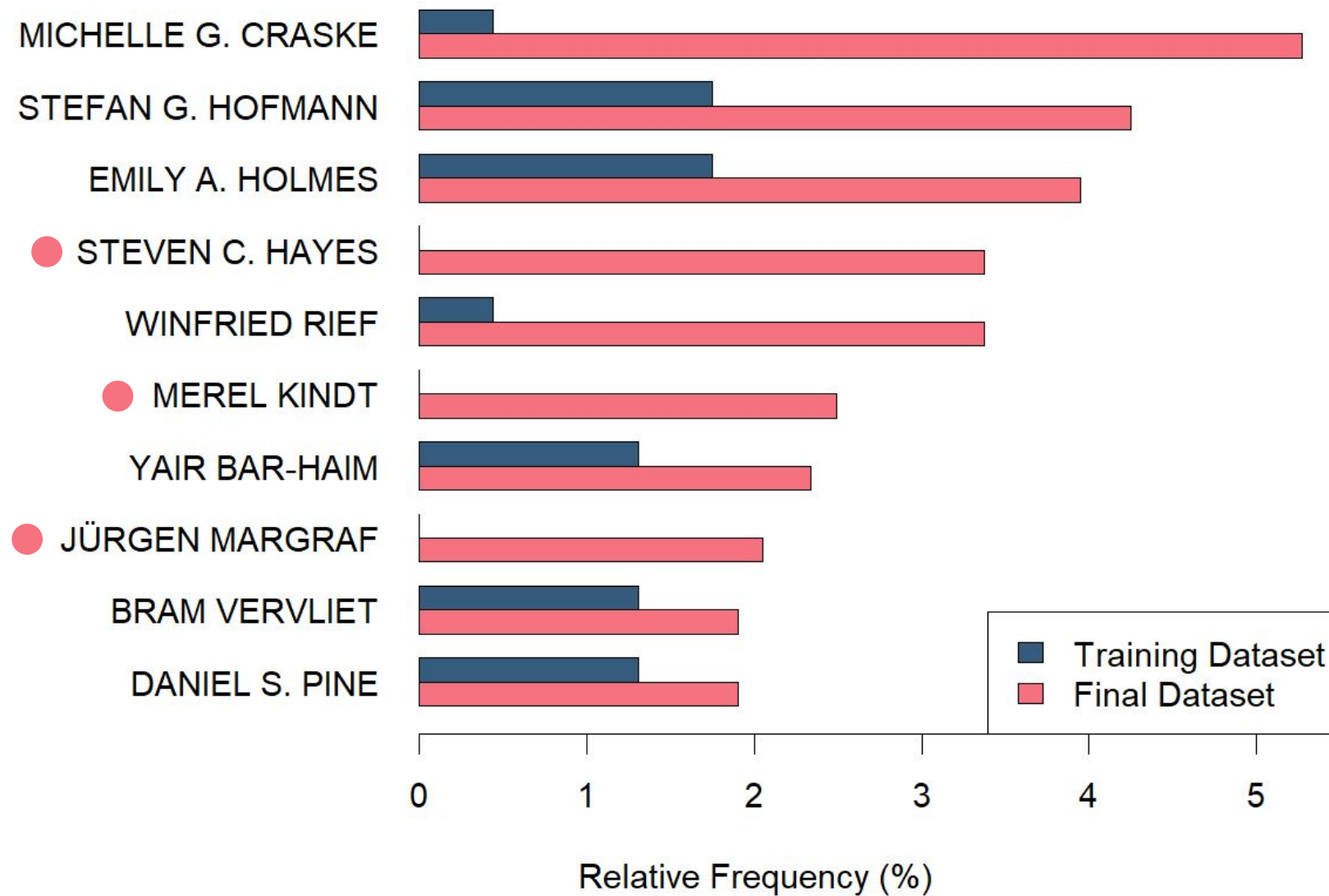
Publication volume, main actors, journals, regional differences

Impact indicators such as citations, collaboration networks and social metrics

# Assessing the Added Value of ML

Criteria	Training Dataset	Final Dataset
N. of publications	229	683
Annual growth rate	9.33	13.07
M citations	21.56	67.38
Median citations	17	21
M Twitter mentions	4.86	20.58
Median Twitter mentions	1	2
Open Access	34.74%	37.21%

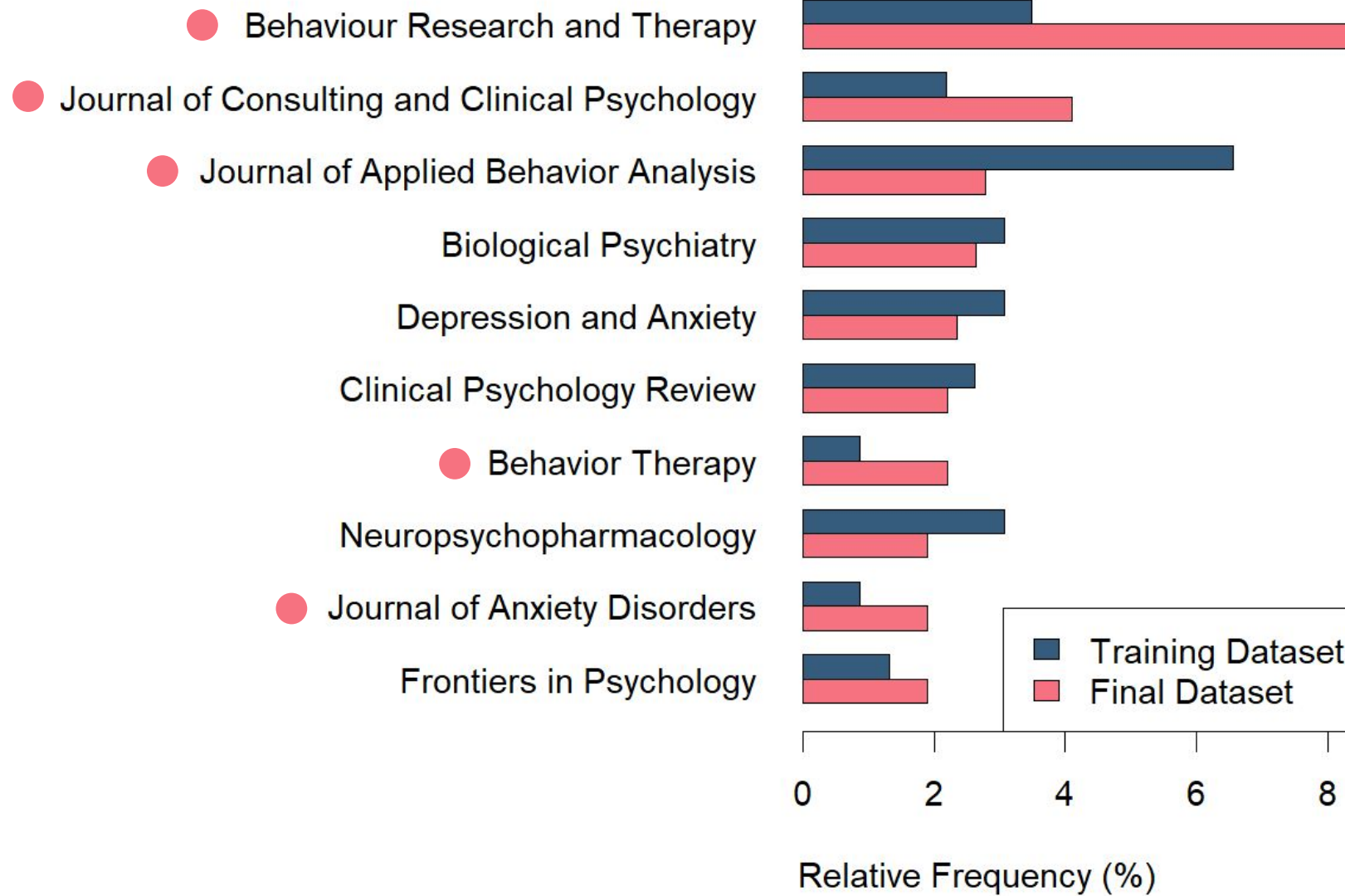
## TOP 10 Authors



# Top 10 Authors

Training Dataset	Final Dataset
Brian D. Greer	Michelle G. Craske
Hans-Ulrich Wittchen	Stefan G. Hoffmann
David M. Fresco	Emily A. Holmes
Douglas S. Mennin	Steven C. Hayes
Kerry J. Ressler	Winfried Rief
Christopher A. Podlesnik	Merel Kindt
Emily A. Holmes	Yair Bar-Haim
James J. Gross	Jürgen Margraf
Stefan G. Hoffmann	Bram Vervliet
Tanja Jovanovic	Daniel S. Pine

## TOP 10 Journals



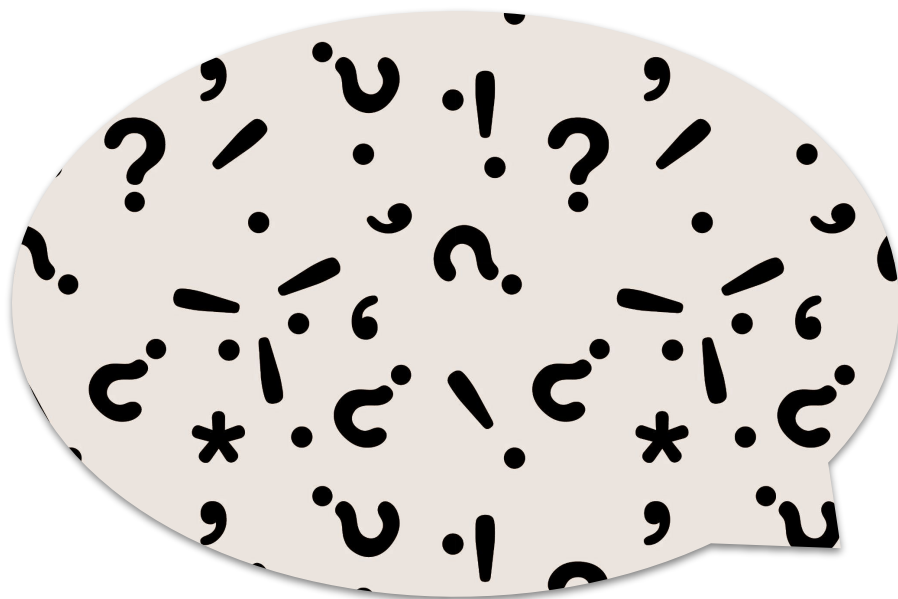
## What does this mean?

ML can facilitate bibliometric analyses of emerging fields with **inconsistent** or partially unknown **terminology** and makes approachable fields that would otherwise be unexplored and **unexplorable**.

- implications for emerging or fragmented fields
- applications when inconsistent terminology
- not only a matter of **time-saving**, but also of **explorability**

## Limitations and Future Research

- only Rayyan → **performance** and **usability** of different classifiers
- pool of relevant references generated manually → more automation
- translational psychotherapy → generalizability across different emerging fields
- define profiles of research fields that could benefit from ML assistance
  - e.g. when is terminology too inconsistent for explicit searches?



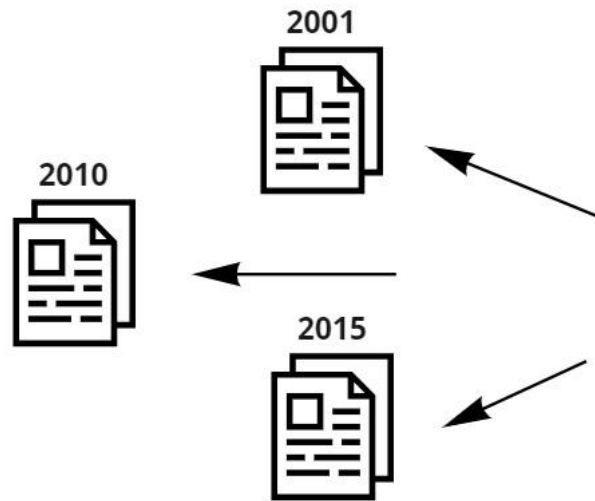
[cp@leibniz-psychology.org](mailto:cp@leibniz-psychology.org)





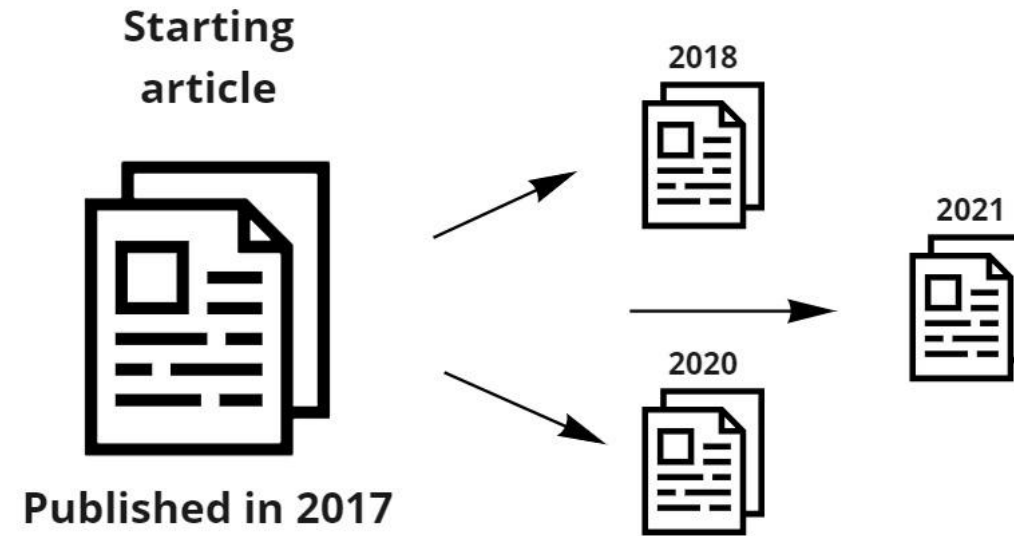
## Backward citation searching

older publications



## Forward citation searching

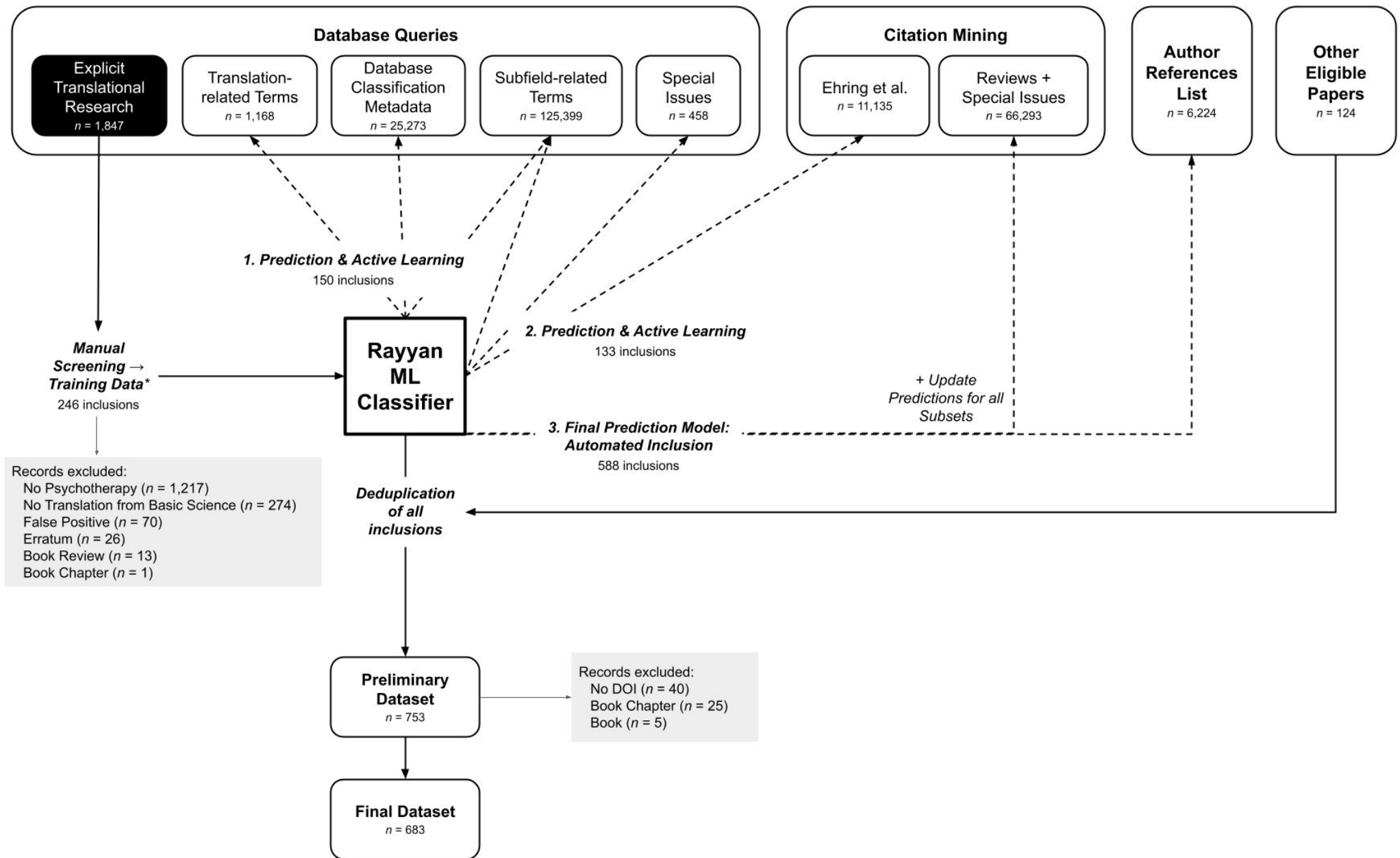
newer publications



Identification

Screening

Included



800 +

Terms





Inclusion decisions

Undecided

Maybe

Included

Excluded

326

0

578

2526

Search methods [Clear] [Add new]

Uploaded References [Translational Issu...

Uploaded References [final exclusions...

Uploaded References [final inclusions ...

326

2,526

578

Keywords for include [Add new]

randomized

trial

controlled trial

randomized controlled trial

compared with

randomly

assigned to

placebo

randomly assigned

double blind

486

461

233

192

192

174

134

130

126

72

More >>

Keywords for exclude [Add new]

trials

animal

this review

animals

reviews

mice

longitudinal

rats

meta-analysis

prevalence

331

281

201

136

135

116

110

110

104

101

More >>

Labels

add later

7

Topics

Depressive Disorder

Memory

Behavior Therapy

Cognitive Therapy

Neurosciences

2022-11-17: Translational Issues in Psychological Science

Detect duplicates

Compute ratings

Export

Copy

New search

All reviews

Showing 1 to 13 of 578 unique entries (filtered from 3,430 total unique entries)

Date

Title

Authors

Rating

2020-01-01

cp Clinical advances in obsessive-compulsive disorder: A position statement by the International College of Obsessive-Compulsive Spectr...

Fineberg, Naomi A., Holland...

2019-01-01

cp Glucocorticoid-induced enhancement of extinction - from animal models to clinical trials.

de Quervain, Dominique, Wo...

2016-01-01

cp Functional neuroimaging of psychotherapeutic processes in anxiety and depression: From mechanisms to predictions.

Lueken, Ulrike, Hahn, Tim

2018-01-01

cp Exclusion-proneness in borderline personality disorder inpatients impairs alliance in mentalization-based group therapy.

Euler, Sebastian, Wrege, Joh...

2017-01-01

cp Bridging the gaps between basic science and cognitive-behavioral treatments for anxiety disorders in routine care. Current status and

Richter, Jan, Pittig, Andre, H...

2013-01-01

cp Self-regulation and mechanisms of action in psychotherapy: A theory-based translational perspective.

Strauman, Timothy J., Goetz...

2015-01-01

cp Psychotherapy and mental health as a psychological science discipline.

Wittchen, Hans-Ulrich, Haert...

2011-01-01

cp Design of the CANDIS-study (CANNabis DISorders) for the treatment of cannabis use disorders: An example of translational research.

Hoch, Eva, Buehringer, Gerh...

2016-01-01

cp The key role of extinction learning in anxiety disorders: Behavioral strategies to enhance exposure-based treatments.

Pittig, Andre, van den Berg, ...

2019-01-01

cp Innovative psychotherapy research: towards an evidence-based and process-based individualized and modular psychotherapy.

Brakemeier, E.-L., Herpertz, ...

2014-01-01

cp The need for a behavioural science focus in research on mental health and mental disorders.

Wittchen, Hans-Ulrich, Koen...

Include

Maybe

Exclude

Reason

Label

Add Note

Highlights ON

Upload PDF full-texts

Bridging the gaps between basic science and cognitive-behavioral treatments for anxiety disorders in routine care. Current status and future demands.

Als Kernkomponente der Cognitive Behavioral Therapies (CBT) ist die Verhaltensexposition eine effektive Behandlung von Angststoerungen. Neuere Behandlungsstudien zeigen jedoch relativ hohe Raten von Abbruch, Ausschluss und Rueckfall der Behandlung, was auf einen erheblichen Bedarf an Optimierung und Personalisierung bestehender Behandlungsverfahren hindeutet. Der vorliegende Artikel zielt darauf ab, aktuelle Herausforderungen und zukuenftige Anforderungen an die translationale Forschung in der CBT fuer die Angststoerungen anzugehen, einschliesslich (1) eines besseren Verstaendnisses der Mechanismen, die Verhaltensaenderungen bewirken, (2) der Identifizierung wichtiger Quellen individueller Variationen, die als Moderatoren des Behandlungserfolgs fungieren koennen, und (3) der Ausrichtung auf praktische Hindernisse fuer die Verbreitung der Expositionstherapie in der Routineversorgung. Basierend auf einem rekursiven Prozessmodell der Psychotherapieforschung beschreiben wir verschiedene Schritte zur systematischen Umsetzung der Grundlagen- und klinischen Forschung "von der Bank zum Bett" in die Routineversorgung und umgekehrt. Einige dieser Aspekte koennen den zukuenftigen Fahrplan fuer die evidenzbasierte Psychotherapieforschung stimulieren, um die Behandlung von Angststoerungen als eine der wichtigsten gesundheitlichen Herausforderungen unserer Zeit besser ins Visier zu nehmen. As a core component of cognitive-behavioral therapies (CBT), behavioral exposure is an effective treatment for anxiety disorders. Still, recent treatment studies demonstrate relatively high rates of treatment dropout, nonresponse, and relapse, indicating a substantial need for optimizing and personalizing existing treatment procedures. The present article aims to address current challenges and future demands for translational research in CBT for the anxiety disorders, including (1) a better understanding of those mechanisms conferring behavioral change, (2) identifying important sources of individual variation that may act as moderators of treatment response, and (3) targeting practical barriers for dissemination of exposure therapy to routine care. Based on a recursive process model of psychotherapy research we will describe distinct steps to systematically translate basic and clinical research "from bench to bedside" to routine care, but also vice versa. Some of these aspects may stimulate the future roadmap for evidence-based psychotherapy research in order to better target the treatment of anxiety disorders as one core health challenge of our time. (Original / ZPID)

Authors: Richter, Jan, Pittig, Andre, Hollandt, Maike, Lueken, Ulrike;

Journal: - Volume 0, Issue 0, pp. - published 2017-01-01

cp

Help

# rayyan 's Inclusion Probability

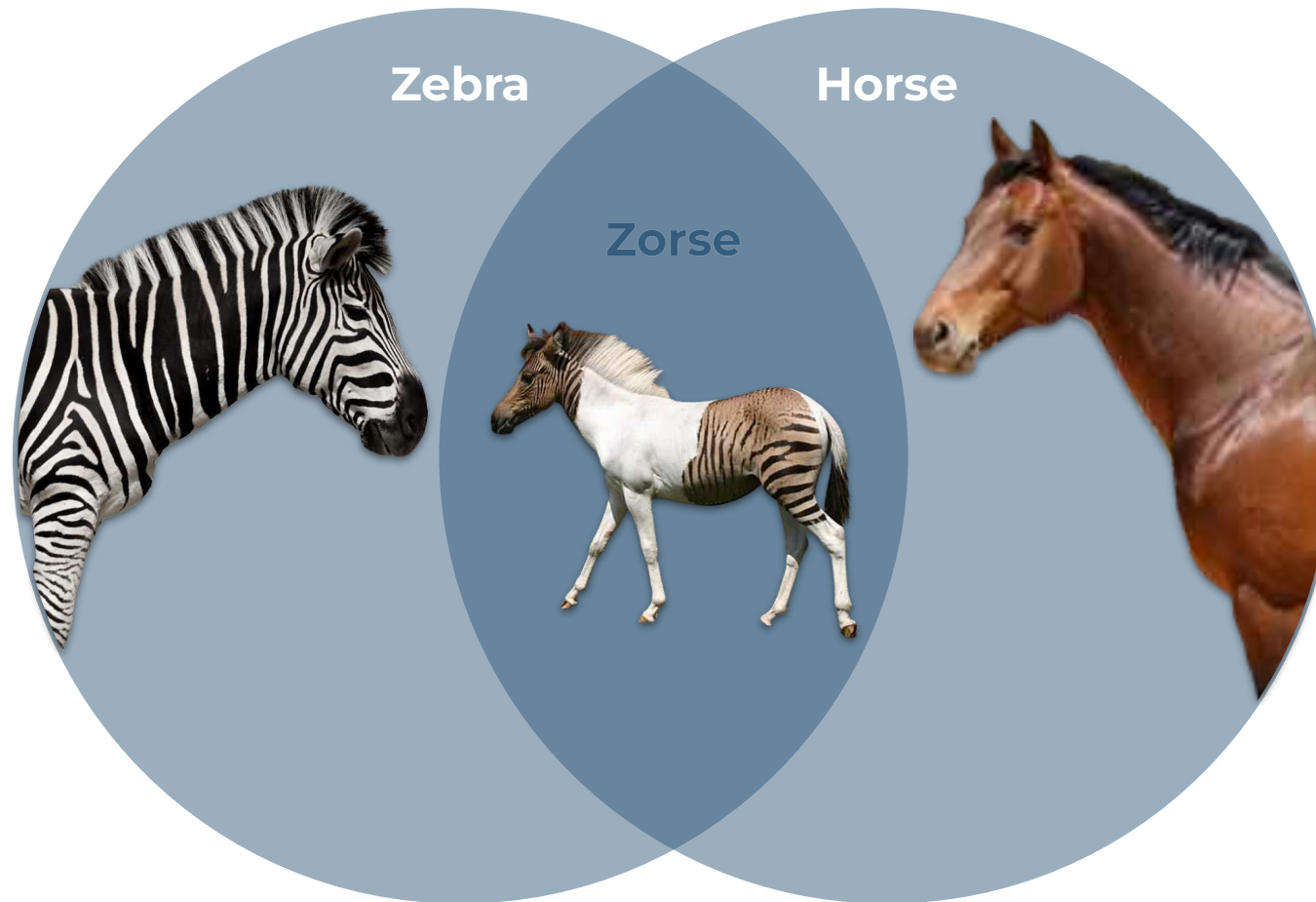
Round of Active Learning	$\geq .9$			$< .9 \cap \geq .7$		
	$n$ Predicted	$n$ Included	Precision	$n$ Predicted	$n$ Included	Precision
1	211	107	<b>.51</b>	76	43	<b>.57</b>
2	74	74	<b>1</b>	62	59	<b>.95</b>



## Zorse

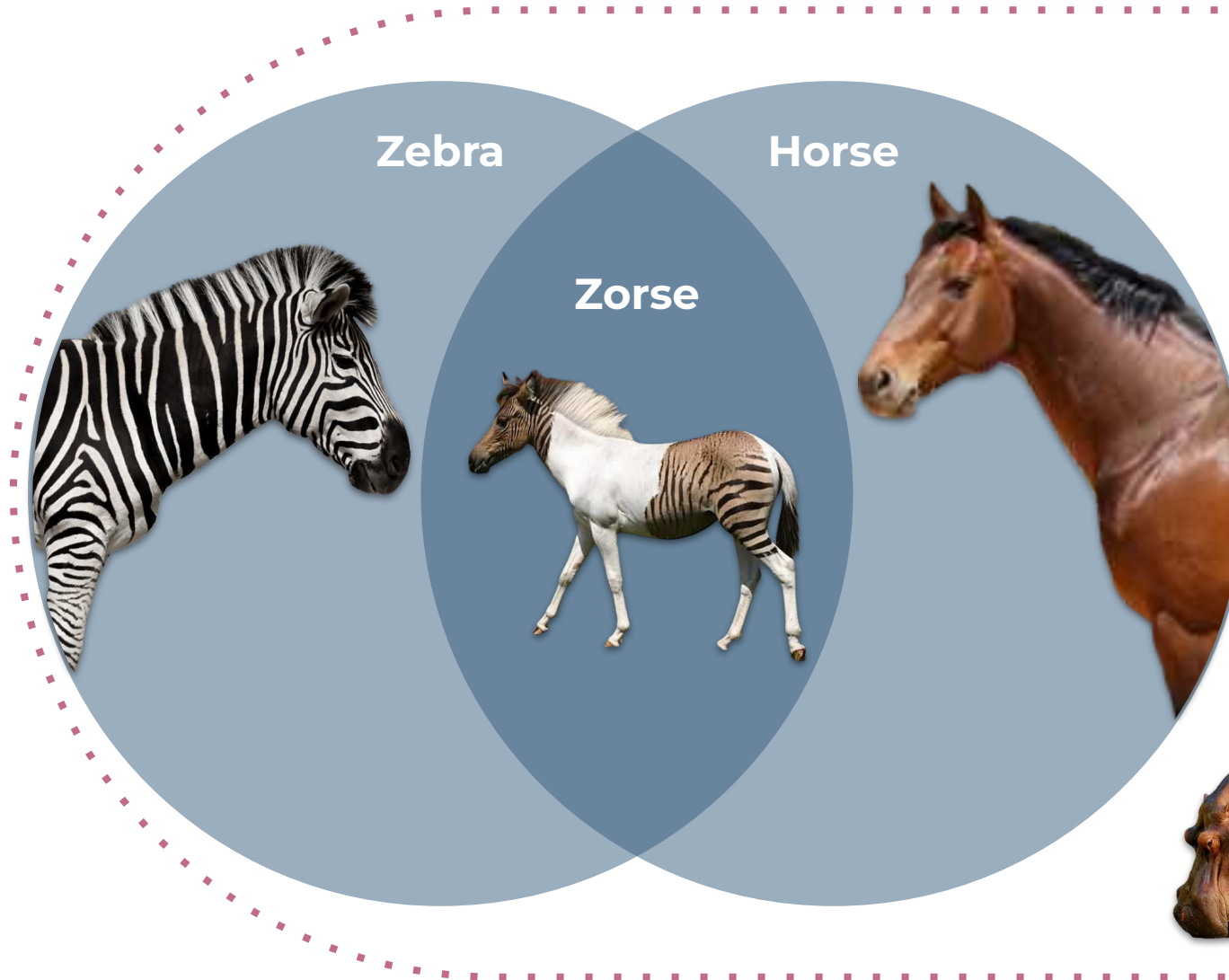






1. Explicit Level - (n = 1,847)  
"Translational AND Psychotherapy"

**Seahorse**  
**Zebra crossing**  
**Unicorn**  
**Hippo** (Nilpferd)

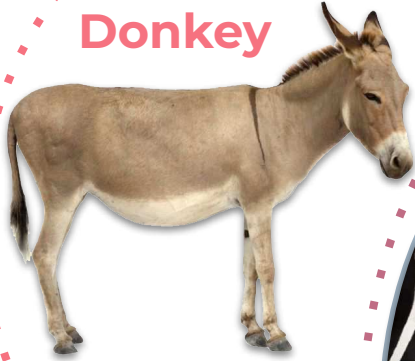


1. Explicit Level - (n = 1,847)  
"Translational AND Psychotherapy"

2. Synonyms Level (n = 1,168)

**Equus**  
*equidae*

**Donkey**



**Zebra**



**Horse**



**Zorse**



**Seahorse**  
**Zebra crossing**  
**Unicorn**  
**Hippo** (Nilpferd)



1. Explicit Level - (n = 1,847)  
"Translational AND Psychotherapy"

2. Synonyms Level (n = 1,168)

3. Classification Level (n = 25,273)  
Classification Codes (CC)

4. Concept Level (125,399)  
Controlled Terms (SH and HW) and Thesaurus-Liste (CT)

