There is a crisis of reproducibility, integrity and transparency in psychological sciences. It is estimated that as much as 85% of the money invested is wasted, leading to many errors, so that most negative results are never reported and more than 50% of published studies are reported selectively. In anonymous surveys, most scientists admit that they use questionable research practices to obtain more attractive results. A growing consensus of scientific opinion is questioning the transparency and integrity of commercial-sponsored clinical research practices, which poses a threat to the future of clinical research in psychology. This crisis of rigor and reliability results in misinformation and diminishing societal trust in the scientific method. To a large extent this is caused by unreliable methods for conducting and reporting studies.

This project will investigate research methods and practices to understand how to reduce biases and improve methodological quality in psychological science with a focus on clinical trials and thereby deliver more reliable and secure conclusions from clinical studies conducted in psychology. This project will include critical evaluation of scientific data to synthesize evidence to assess how much we can trust the findings and what aspects of the research process could be improved to increase its value and reduce waste of research resources.

Meta-research ("research on research") is the best approach for understanding whole fields of scientific endeavour and correcting the overall course of the research and innovation enterprise. Meta-research encompasses evidence synthesis and evaluation of credibility and trustworthiness of research findings with the goal of increasing value (e.g. by fostering research integrity, transparency, replicability and independence) and reducing waste by improving research practice. One of the key priorities for meta-research is to apply its state-of-the-art methods to new fields of research for maximum waste reduction and value increase by solving any existing issues with research integrity.

Therefore, careful evaluation of evidence and critical appraisal of biases using state of the art tools can increase transparency, integrity and independence by identifying specific strengths and weaknesses in various sub-fields of psychology. In this project, a newly developed meta-research methodology will be applied to various fields of psychological research and subsequently an individualized improvement strategy for each field will be proposed. These fields include:

- psychopharmacology versus psychotherapy for depression,

- psychedelic-assisted psychotherapy for mental health problems,

- light therapy and sleep improvement interventions for attention deficit hyperactivity disorder (ADHD),

- psychodynamic-psychotherapy for schizophrenia.

These fields were selected based on both the current research needs and relevant gaps in clinical and methodological knowledge as well as because they represent a broad landscape of clinical research in psychology, from the newly established (psychedelics) and information scarce (light therapy for ADHD) to decades old (psychodynamic psychotherapy) and information dense (depression). These fields of clinical research are also known to vary according to commercial involvement and conflict of interest (e.g., very high for antidepressants, intermediate for psychodynamic psychotherapy and low for psychedelics). These fields were not yet comprehensively analysed and I will use novel meta-research evaluation tools including my own newly developed instruments (conflict of interest, spin, ethical standards).

New methods will be developed including how to systematically detect and deal with scientific misconduct, as well as how to implement lasting positive changes to the current scientific system.

This work will result in new knowledge and research tools that will improve clinical psychological research methods and reporting by developing: methodological rigor, more robust and transparent methods, clearer answers regarding psychological interventions, their safety profile and health effects, decreasing waste of research and clinical resources, reducing the potential misuse of research data.