

## Eye tracking as a tool for understanding misinformation: A systematic review protocol

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### ADMINISTRATIVE INFORMATION

**Support** - Centre for Psychological Research.

**Review Stage at time of this submission** - Formal screening of search results against eligibility criteria.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202520099

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 February 2025 and was last updated on 21 February 2025.

### INTRODUCTION

**Review question / Objective** The purpose of this systematic review is to assess the extent to which eye tracking technology has been used to assess responses to, and interventions for, misinformation and disinformation, and synthesise the available evidence.

It will identify the most relevant eye tracking metrics, such as the number of fixations or fixation duration, that provide an understanding of the effects of incorrect information. Linked to this, the review will evaluate how eye tracking metrics relate to the underpinning cognitive and psychological mechanisms, and in particular visual attention.

The review will also consider whether certain types of mis/disinformation and associated interventions have received particular attention from researchers (e.g., health-related information).

By doing this, the review will provide a comprehensive overview of the state of the field and identify any areas in need of further investigation.

**Rationale** According to the eye-mind hypothesis, there is a crucial link between eye movement and internal psychological processes (e.g., Just & Carpenter, 1980). While the eye-mind hypothesis may be oversimplified (Schindler & Lilienthal, 2019), studying the way in which a person views information, including where their focus is and how long they gaze at certain details, could offer insights into cognition. For this purpose, eye tracking technology has been developed to record “eye motion and gaze location across time and task” (Carter & Luke, 2020, p. 49), and this ocular behaviour can be linked to cognitive processes (Beesley et al., 2019), especially visual attention (Kim et al., 2021).

The use of eye tracking technology could have real potential in understanding the major societal

issues of mis- and disinformation. Eye tracking may help to understanding the way in which people respond to incorrect information and identify individual differences in psychological processing that affect susceptibility to inaccurate information. It could also help to identify characteristics of false messages that influence its effectiveness (Chou et al., 2020) and assess the impact of any interventions designed to tackle misleading information (e.g., George, 2024).

Currently, however, the extent to which eye tracking technology has been incorporated into studies of misleading information is unclear, as no systematic review is available. Given this, the present systematic review will synthesise the available evidence and identify the eye tracking metrics that have been most consistently linked to mis- and disinformation. Through this, it will be able to identify the most important psychological processes and mechanism that affect responses to misleading information, with any gaps in the literature or inconsistent evidence also being detected.

**Condition being studied** No specific conditions will be assessed here, but all eye tracking studies exploring health-related misinformation and disinformation will be eligible for inclusion.

## METHODS

**Search strategy** The search strategy will follow the PRISMA-S checklist (Rethlefsen et al., 2021), covering the information sources and searches.

A range of databases and techniques will be used to identify appropriate literature (see below). The search will combine terms related to eye tracking and mis/disinformation via the Boolean operator “AND”. To capture the eye tracking methodology, the terms “eye tracking or eye gaze or eye-tracking or eye movement measures or eye movement or visual tracking or eye movement analysis or eye movement recording or sight analysis or oculography” will be used. To capture inaccurate or misleading information, the terms “misinformation or disinformation or fake news or false news or propaganda or falsity or falsehood” will be used. This is based on initial experimentation with phrases best capable of detecting relevant studies.

TM and CJ will independently screen the titles and then meet to discuss these, with any disagreements being resolved through discussion and with AB and EB. A similar process will be

adopted for the abstract screening and full paper screening.

**Participant or population** All studies including human participants are eligible for inclusion.

**Intervention** Any interventions that have been used to tackle the effect of mis- and disinformation will be evaluated, such as humour (e.g., Kim et al., 2021). However, an intervention is not a requirement for inclusion.

**Comparator** N/A.

**Study designs to be included** All quantitative study designs employing eye tracking will be included, such as experiments, quasi-experiments and correlational designs. Both cross-sectional and longitudinal studies are eligible for inclusion.

**Eligibility criteria** • Sources must include a full article describing an empirical study (e.g., abstracts, letters/observations or secondary summaries of data, such as textbooks or literature reviews, will not be included).

- Studies must include primary data collection and quantitative data analysis.
- Studies must use eye tracking equipment and report associated data, such as fixation duration or number of fixations.
- Studies must consider the veracity of any materials presented to participants and incorporate information known to be incorrect (e.g., specific forms of misinformation or a truthfulness judgement exercise of some misleading statements). Studies considering accurate information only will not be included (e.g., the effects of different types of accurate health messages), but studies using both accurate and inaccurate information are eligible for inclusion.
- Studies must be written in English.

There is no specific eligibility concerning the date of the study, so the earliest search date for each database will be used.

**Information sources** The electronic databases to be used include the full Web of Science collection (Web of Science Core Collection; BIOSIS Citation Index; Grants Index; KCI-Korean Journal Database; MEDLINE; Preprint Citation Index; ProQuest™ Dissertations & Theses Citation Index; SciELO Citation Index) and the most relevant databases within EBSCO Host Databases (APA PsycInfo, MEDLINE, Education Research Complete, CINAHL Ultimate, Psychology and Behavioral Sciences Collection and SocINDEX). Both the EBSCO and Web of Science database

collections are capable of finding preprints, dissertations and theses, which is a useful way of sourcing grey literature, but this will be supplemented with the British Library database and Google Scholar. Finally, the references list of sources that meet the inclusion criteria will also be assessed to identify any other relevant studies, and the results of the literature search will be compared against an informal literature search conducted by TM in May and June 2024.

**Main outcome(s)** 1. Identify insights provided by eye tracking technology into responses to, and interventions for, misinformation and disinformation, and synthesise the available evidence.  
2. Identify specific eye tracking metrics most consistently linked to the processing of, and responses to, incorrect information. The connection between these eye tracking metrics and psychological processes will then be considered.  
3. Identify any common methodological issues, gaps in the literature and directions for future research.

**Data management** The Mendeley Reference Manager (Version 2.125.2) will be used to manage the references and literature review process.

**Quality assessment / Risk of bias analysis** The quality of studies will be assessed through the Appraisal Tool for Cross Sectional Studies (AXIS; Downes et al., 2016). This 20-item tool examines study reliability through a series of questions that have a “Yes”, “No” or “Don’t know” response. A total score is then calculated, with higher scores indicating better study quality. TM and CJ will assess the quality of each study independently, and then the mean score will be calculated.

**Strategy of data synthesis** Specific information will be extracted from each study, including sampling details and participant characteristics, methodological details (such as measures used, the design and the eye-tracking equipment/metrics), statistical analysis and main findings. The data extraction and quality assessment form developed by Byrne et al. (2024) will be used to achieve this. Given the likely disparate nature of designs, topics and interventions, a narrative synthesis will be used to summarise and synthesise the main findings.

**Subgroup analysis** N/A.

**Sensitivity analysis** N/A.

**Language restriction** English language only.

**Country(ies) involved** United Kingdom.

**Keywords** Eye tracking; misinformation; disinformation.

**Dissemination plans** This systematic review will be submitted for publication in a peer-reviewed journal.

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