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What is 'Open Science'?
Operationalisation of Open Science in Survey Research

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Literature review

What is measured in surveys investigating the uptake of Open Science? While many investigators would include 'open data' in the operationalization of Open Science as a concept, other relevant practices such as pre-printing may be overlooked. We present results from a literature study on the operationalization of Open Science practices in survey research.

The literature study was conducted by a team of research support professionals, qualitative researchers and quantitative researchers, at the Open Science Retreat 2024.[1] Together, we collected, reviewed, and analysed the questionnaire items in survey studies about open science practices. Our study materials are openly available, with the literature list on Zotero,[2] and a research report on ResearchEquals.[3]

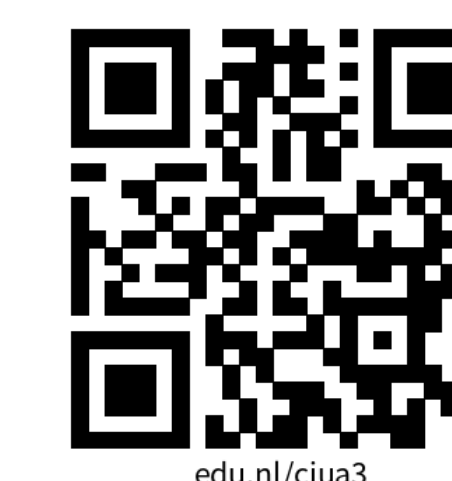### Quantitative & qualitative analyses

We categorized *which* Open Science practices were included in the operationalization of 'Open Science', and inventoried *how* the studies formulated the questionnaire items. All of the studies that we identified in the literature search were analysed quantitatively (see Figure 1 & 2), but only studies with open materials could be analysed qualitatively (see Table 1).

The main categories of Open Science practices we encountered were 'Open data', 'Open access', 'Pre-registration', and 'Open code'. The definition of Open Science seems to broaden from 2017 onwards.

Qualitative analysis identified seven question domains: 1) awareness, 2) attitudes, 3) intention, 4) behaviour, 5) barriers, 6) benefits and 7) conditions. Table 1 shows questionnaire items corresponding to some of these domains.

Explore, reuse, & contribute to our materials

We developed an interactive overview of the studies we identified.[4]

Check out our interactive dashboard!

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Via this online dashboard, you can browse the literature study data and findings. The dashboard code is available on GitHub,[5] with a persistent identifier on Zenodo.[6] The dashboard may be used e.g. to reuse questionnaire items in future research.
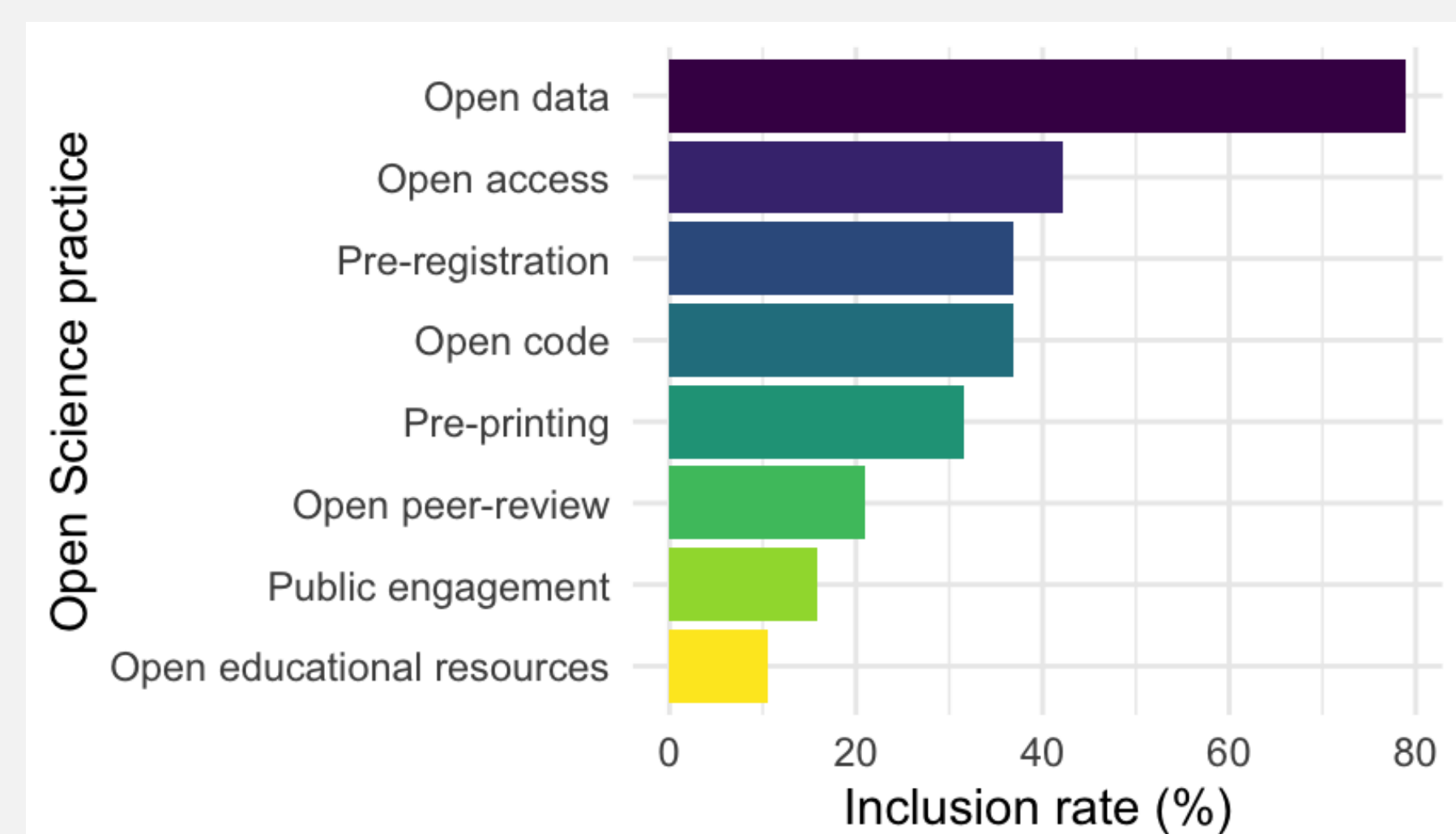

Figure 1. Open Science is more than just open data.

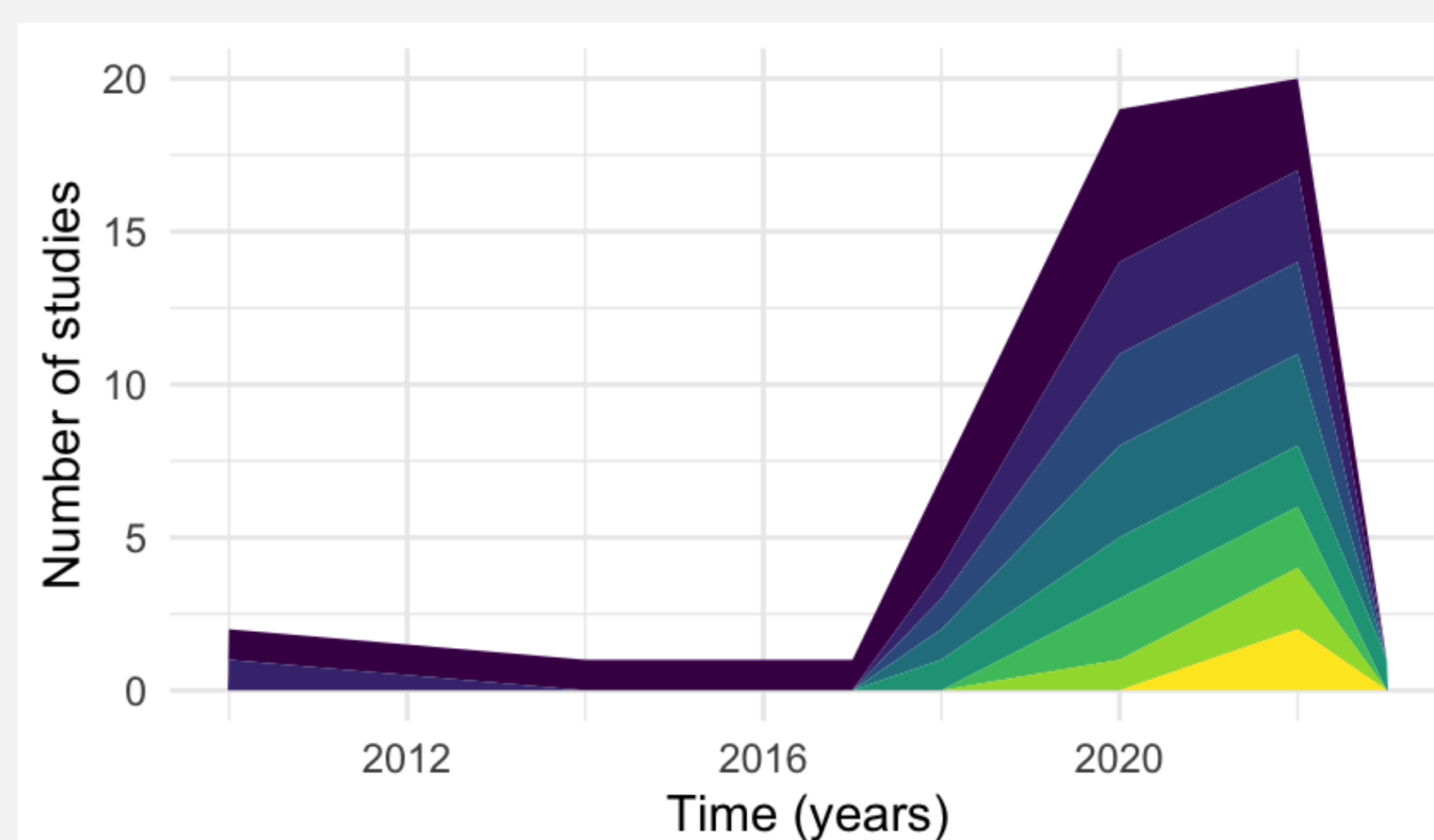**Figure 2**. Gradual inclusion of more Open Science practices.

Table 1. Some typical survey questions.

Domain	Questionnaire item
Attitudes	"How desirable do you think [*Open Science practice*] is for your research field?"
Behaviors	"How likely are you to use [*Open Science practice*] for your next paper?"
Barriers	"[*Open Science practice*] is too time consuming for me."
Benefits	"What do you see as the greatest benefit of [*Open Science practice*]?"

References
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