



Dynamics of cumulative advantage in science reform: lessons for Open Research from Diffusion of Innovation theory

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Unintended Consequences of Science Reform

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- H2020 project: October 2019 - March 2022
- How and in which ways might open and responsible research practices be worsening existing inequalities?
- Methods: Sociological, bibliometric and computational approaches

Objectives

- Ensure that Open Science & RRI interventions contribute to a more equitable scientific system
- Distribution of rewards based on merit rather than privilege





Unintended Consequences of Open Research

- The APC Effect of stratified OA publishing: authors from better-resourced institutions are able to pay higher APCs on average than those from less-resourced ones (Klebel & Ross-Hellauer, 2022), giving them preferential access to higher-cost, higher-impact journals (Gray, 2020; Tennant & Lomax, 2019).
- Better-resourced researchers are better able to engage with policy-makers at the science-policy interface, giving them the opportunity to influence policy development more so than their lesser-resourced colleagues (Cole, Reichmann & Ross-Hellauer, 2023).
- Open data may widen the academic digital divide due to the infrastructure-dependent, situated nature of open data practices (Bezuidenhout et al., 2017; Johnson, 2018; Klump, 2017).

See our paper for more examples: ‘Dynamics of cumulative advantage and threats to equity in open science: a scoping review’, Royal Society Open Science, <https://doi.org/10.1098/rsos.211032> (Ross-Hellauer et al. 2022).





Dynamics of cumulative advantage in Open Research

- The Matthew Effect – the rich get richer
- Unequal access to resources, combined with other structural and systemic inequalities, is fostering cumulative advantage through Open Research implementation
- Open Research is resource-intensive
- Those with more resources are better positioned to implement Open Research and to reap the benefits of doing so
- They then establish the practices and norms and set the agenda and create policies that become standards, based on their positionality and worldviews

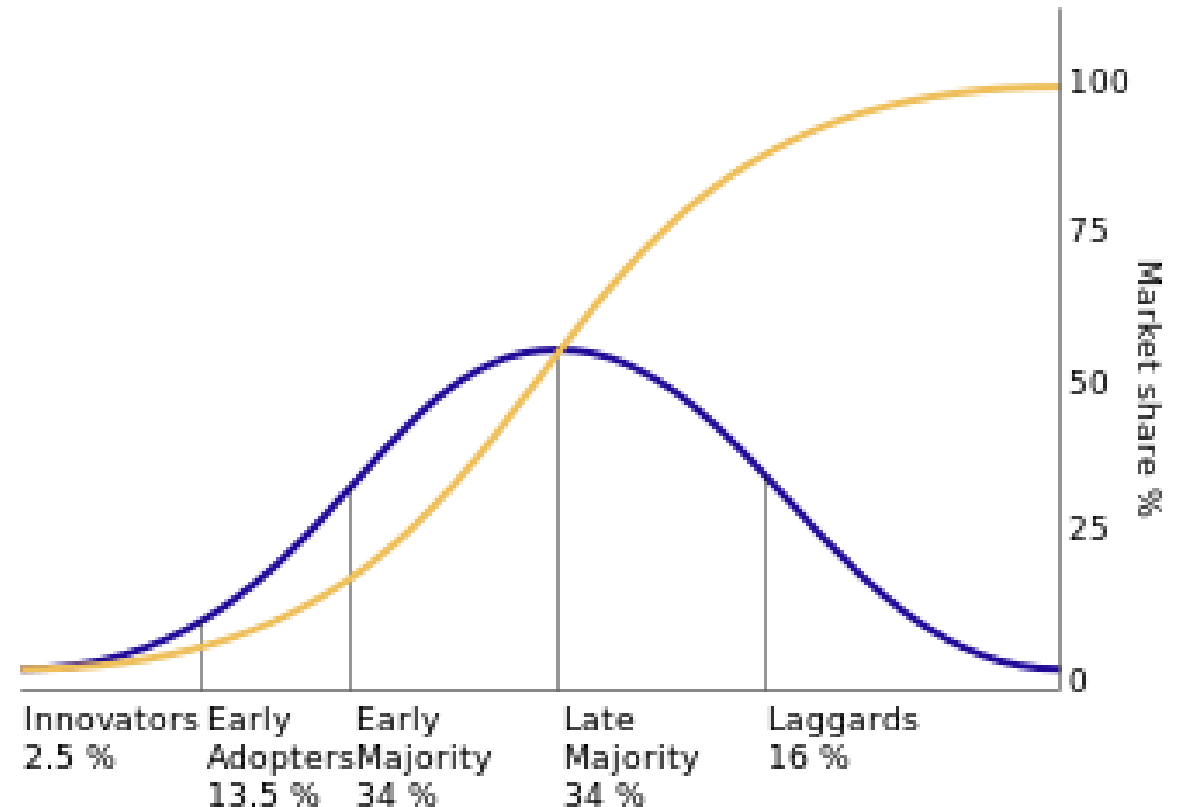




Parallels with Diffusion of Innovation Theory

Rogers' theory holds that innovations often widen existing socioeconomic gaps (2003). This occurs because:

1. Early adopters tend to have more resources at their disposal to enable them to adopt higher-cost innovations;
2. Those driving innovative change focus on doing so within their existing social networks, which are socio-economically homogeneous;
3. Those that adopt early receive 'windfall profits' that widen the gap between them and others.





How to Counteract These Dynamics

To address these ill effects, Rogers instructs that:

1. Attention should be paid to what types of messages are distributed about innovations, to whom they are targeted and how they are communicated;
2. Efforts should be made to establish networks of change within less-resourced groups that link them to change agents;
3. The context-based needs and desires of the less-resourced should be incorporated into the design and diffusion of innovations (Ibid.).

[UNESCO Recommendation on Open Science](#)

[Declaration of the 10th World Science Forum on Science for Social Justice](#)

[Global Thinking: ON-MERRIT Recommendations for Maximising Equity in Open and Responsible Research](#)





To learn more visit <https://on-merrit.eu/>

Download the recommendations directly at
<https://zenodo.org/record/6276753#.YjCHITUo98I>

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