

Work package v

On the viability of conspiratorial beliefs

Grimes, 2016b and Grimes, 2016a

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Task: Read the abstract and summarize the main findings of the paper. Use additional material when available. Reflect what the findings imply with respect to potential interventions to misinformation and conspiracy theories.

Abstract

Conspiratorial ideation is the tendency of individuals to believe that events and power relations are secretly manipulated by certain clandestine groups and organisations. Many of these ostensibly explanatory conjectures are non-falsifiable, lacking in evidence or demonstrably false, yet public acceptance remains high. Efforts to convince the general public of the validity of medical and scientific findings can be hampered by such narratives, which can create the impression of doubt or disagreement in areas where the science is well established. Conversely, historical examples of exposed conspiracies do exist and it may be difficult for people to differentiate between reasonable and dubious assertions. In this work, we establish a simple mathematical model for conspiracies involving multiple actors with time, which yields failure probability for any given conspiracy. Parameters for the model are estimated from literature examples of known scandals, and the factors influencing conspiracy success and failure are explored. The model is also used to estimate the likelihood of claims from some commonly-held conspiratorial beliefs; these are namely that the moon-landings were faked, climate-change is a hoax, vaccination is dangerous and that a cure for cancer is being suppressed by vested interests. Simulations of these claims predict that intrinsic failure would be imminent even with the most generous estimates for the secret-keeping ability of active participants—the results of this model suggest that large conspiracies (>1000 agents) quickly become untenable and prone to failure. The theory presented here might be useful in counteracting the potentially deleterious consequences of bogus and anti-science narratives, and examining the hypothetical conditions under which sustainable conspiracy might be possible.

Zusammenfassung

Unter konspirativem Gedankengut versteht man die Neigung des Einzelnen zu glauben, dass Ereignisse und Machtverhältnisse insgeheim von bestimmten geheimen Gruppen und Organisationen manipuliert werden. Viele dieser angeblich erklärenden Vermutungen sind nicht falsifizierbar, haben keine Beweise oder sind nachweislich falsch, dennoch ist die öffentliche Akzeptanz nach wie vor hoch. Bemühungen, die Öffentlichkeit von der Gültigkeit medizinischer und wissenschaftlicher Erkenntnisse zu überzeugen, können durch solche Darstellungen behindert werden, die in Bereichen, in denen die Wissenschaft gut etabliert ist, den Eindruck von Zweifeln oder Uneinigkeit erwecken können. Umgekehrt gibt es historische Beispiele für aufgedeckte Verschwörungen, und es kann für die Menschen schwierig sein, zwischen vernünftigen und zweifelhaften Behauptungen zu unterscheiden. In dieser Arbeit stellen wir ein einfaches mathematisches Modell für Verschwörungen auf, an denen mehrere Akteure beteiligt sind, und ermitteln die Wahrscheinlichkeit des Scheiterns einer bestimmten Verschwörung. Die Parameter für das Modell werden anhand von Literaturbeispielen bekannter Skandale geschätzt, und es werden die Faktoren untersucht, die den Erfolg und das Scheitern von Verschwörungen beeinflussen. Das Modell wird auch verwendet, um die Wahrscheinlichkeit von Behauptungen zu schätzen, die sich aus einigen weit verbreiteten konspirativen Überzeugungen ergeben, nämlich dass die Mondlandungen gefälscht wurden, dass der Klimawandel ein Schwindel ist, dass Impfungen gefährlich sind und dass ein Heilmittel für Krebs durch Interessengruppen unterdrückt wird. Simulationen dieser Behauptungen sagen voraus, dass selbst bei den großzügigsten Schätzungen für die Fähigkeit der aktiven Teilnehmer, Geheimnisse zu bewahren, ein Scheitern unmittelbar bevorsteht - die Ergebnisse dieses Modells legen nahe, dass große Verschwörungen (>1000 Agenten) schnell unhaltbar werden und zum Scheitern neigen. Die hier vorgestellte Theorie könnte nützlich sein, um den potenziell schädlichen Folgen von gefälschten und wissenschaftsfeindlichen Narrativen entgegenzuwirken und die hypothetischen Bedingungen zu untersuchen, unter denen eine nachhaltige Verschwörung möglich sein könnte.

Übersetzt mit www.DeepL.com/Translator (kostenlose Version)

References

- Grimes, D. R. (2016a). Correction: On the Viability of Conspiratorial Beliefs. *PLOS ONE*, 11(3). <https://doi.org/10.1371/journal.pone.0151003>
- Grimes, D. R. (2016b). On the viability of conspiratorial beliefs. *PLoS ONE*, 11(1). <https://doi.org/10.1371/journal.pone.0147905>

for the conspirators ($p = 4.09 \times 10^{-6}$), we can apply the model outlined to several popular and enduring conspiracy theories and ascertain their viability with time. As discussed in the previous section, this estimate is intentionally optimistic for conspirators, and corresponds to a case where the average expected number of fatal leaks for a conspiracy is as low as roughly 4 in a million. In keeping with “best case scenario” estimates for conspiracies, we also neglect the upper figure of $p = 2.45 \times 10^{-4}$, which is roughly 60 times greater than the minimum projected probability of failure per conspirator per year as outlined in [Table 1](#).

Results

[Table 2](#) lists non-exhaustive estimations of the number of conspirators required for the anti-science belief outlined. Critically, the estimates for $N(t)$ shown here assume all scientists involved would have be aware of an active cover-up, and that a small group of odious actors would be unable to deceive the scientific community for long timescales; the rationale for this assumption is expanded further in the discussion section. In most of these cases, constant up-keep would be required to maintain secrecy, so $N(t) = N_0$. In the case of the NASA hoax conjecture, it could be argued that the conspiracy was a single-event fiction, and thus the Gompertzian population form in [Eq 5](#) could apply. This is not a very realistic assumption, but is

Table 2. Non-exhaustive estimates of minimum numbers needed for conspiracy.

Conspiracy	Employed	Total
Moon-landing Hoax		
Peak NASA employment (1965) [40]	411,000	411,000
Climate-change fraud†		
American Geo-Physical Union [41]	62,000	
NASA (Current) [42]	58,000	
American academy for Advancement of Science [43]	120,000	
Royal Society Fellows [44]	16,000	
European Physical Society [45]	120,000	
Published Climate Scientists [46]	≈29,083	
<i>Total</i>		≈405,000
Vaccination Conspiracy*		
Centre for Disease Control (CDC) [47]	15,000	
World Health Organisation (WHO) [48]	7,000	
<i>Total</i>		22,000
Suppressed Cancer cure*		
Novartis	65,262	
Pfizer	116,500	
Roche	78,604	
Sanofi	105,000	
Merck and Co.	70,000	
Johnson and Johnson	122,200	
GlaxoSmithKline	99,000	
AstraZeneca	57,500	
<i>Total</i>		≈714,000

† Estimated from sample memberships of scientific organisations supporting AGW consensus.

* Assuming only major international public health bodies involved in cover-up.

* Peak staff numbers for 8 top pharmaceutical companies.

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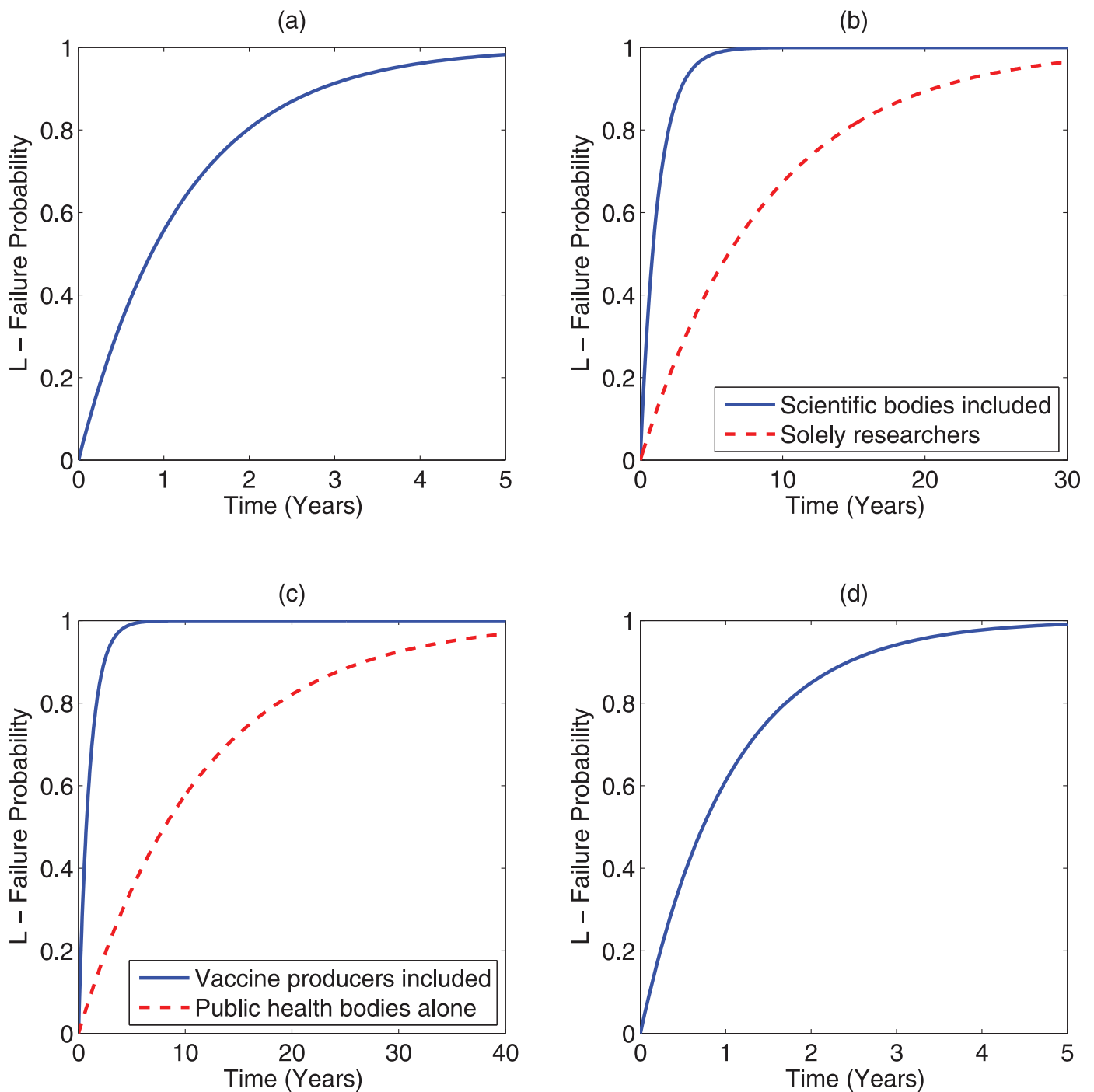


Fig 2. Failure curves for (a) NASA moon-landing hoax—results for both constant population and Gompertzian function are so close as to be non-resolvable visually (b) Climate change hoax—The blue solid line depicts failure probability with time if all scientific bodies endorsing the scientific consensus are involved, the red-dotted line presents the curve if solely active climate researchers were involved (c) Vaccination conspiracy—blue solid line showing failure probability with time for a combination of public health bodies and major drug manufacturers and the red-dotted line depicting case if only public health bodies were conspiring (d) Failure with time for a suppressed cancer cure conspiracy.

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