

Conceptualizing and characterizing the mechanisms for Grimapct

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Introduction

The rise of the “impact” agenda has in part provided a forum where the public value of research is discussed, weighed and promoted. It has been included as a formal criterion in many funding paradigms across Europe, UK and North America – all countries where the effect of these political changes are acutely felt. This has included the widening of research funding criteria to include notions of research excellence beyond academia, as well as the inclusion of public representatives as members of extended peer review panels. Its inclusion is reflective of the “abstract faith” that public assign trust in science (Luhmann, 1979), and the potential it brings to improving their lives.

Any claim for the wider public value of research depends on making claims on behalf of the public and what creates value for them. A distinction can be drawn here between creating social capacities and whether publics regard those capacities as being positive or negative depending on their ideological inclination. In the long-term perspective, publics have been conditioned to regard valuable research as research that creates a positive economic impact. This, on the other hand, creates the short-term problem which we potentially envisage; there are no generally believable claims for the public value of science to use as baseline indicators when particular political projects make populist claims about the positive or negative impact of specific branches of research.

Within these debates around the wider value of publicly funded research, is discussion about negative impact. What is missing is a deeper conceptual exploration of this politically contested version of impact in terms of its definitions, characteristics and precursors, and without that necessary is it not possible to get beyond the domination of economic and non-controversial versions of impact. A useful starting point is to look at extreme examples of impact and public valuation of that impact, namely where there is a strongly negative impact, what is referred to in this paper as “Grimapct”. It presents three powerful cases (Siggelhow,

2007) of Grimpact to better trace out the core tensions, drivers and lines of force within this wider notion of public value.

Methodology

Selection of case-studies

Three case studies were selected as powerful cases that represent an extreme where the tensions are so foregrounded that it becomes possible to more clearly perceive them as the basis for addressing them. A description of their precursors and an exploration of their identification as “negative” is provided below.

Measles Mumps and Rubella combined vaccine (MMR)

Published in The Lancet in 1998, the paper “*Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children*” by Wakefield and colleagues, implied a link between the measles, mumps and rubella (MMR) vaccine and a “new syndrome” of autism and bowel disease. As a result, a vaccine scare ensued where vaccine rates globally dropped, as worried parents withdrew from voluntary vaccine programmes (to a vaccination level of 80% in the UK, well below the WHO 95% level for herd immunity). Although the causality of this link (between publication and falling vaccination rates) has been difficult to quantify (Godlee, 2011) especially on its direct impact (vaccine coverage), it is even more difficult to quantify its indirect impacts (resources away from studying autism, contribution to the decrease in trust of experts).

What makes this a case of Grimpact from this paper’s perspective is that as the ensuing vaccine scare took off, critics of the paper quickly noted that it was a small case series with no controls that linked three common conditions and relied too heavily on parental recall and beliefs. A number of major scientific and professional organisations argued that there was clear evidence of data falsification, whilst subsequent epidemiological studies continued to find no evidence of a link between the MMR vaccine and autism. Wakefield was given many opportunities either to replicate the paper’s findings, or to acknowledge his failings but declined to do either. In 2010 after a hearing by the general Medical Council regarding Wakefield’s fitness to practice as a medical professional, The Lancet retracted the article citing fatal flaws both scientifically and ethically. Despite having been stripped of his clinical and academic credentials, he continues to push his views to a growing number of anti-vaccination groups.

Cambridge Analytica (CA)

A second more recent case study used is the Cambridge Analytica scandal that emerged into public consciousness in early 2018, with an investigation into the research of a Dr Aleksandr Kogan and Dr Michal Kosinski from Cambridge University and his connections to a data company, Cambridge Analytica. Cambridge Analytica has since been linked with Breitbart’s Steven Bannon, and the use of what some have called information warfare to unduly influence the outcomes of a number of elections, most high profile the UK Brexit Referendum, European elections, 2016 US Presidential Election with the total number of rigged votes estimated by some to be as high as 200.

As part of his research into neuro-psychology, Dr Aleksandr Kogan built the app “thisisyourdigitallife” in 2014, marketed through his company Global Science Research in collaboration with Cambridge Analytica. Using Kogan’s app, participants consented for the data to be used for academic purposes only. However Facebook allowed for data to be collected not just on the participants, but also all people within the participant’s social network. As a result, an conservatively estimated 50m profiles were collected and, through Kogan’s affiliations with CA, allowed to be used for commercial purposes.

In combination with the work of Michal Kosinski (also affiliated with CA and Cambridge University), which developed behavioural models based on users’ social media interests (“likes”) (Kosinski, 2013), and using a tool known as “behavioural microtargeting” (Kosinski, 2015) was also to influence behaviour. The use of this data has been since linked to unduly influencing the US elections since 2014, including the 2016 Presidential election; the 2016 UK/Europe referendum; and the 2013 & 2014 Kenyan elections. The capture of these grimfacts is still ongoing, and will be monitored as this study continues.

Economic theory and the financial crisis (ETFC)

The 2008 global financial crisis was mostly due to misbehaviours from financial private firms, such as banks or rating agencies, who have been accused of committing financial crimes by offering predatory loans, gambling with toxic assets, and selling Ponzi schemes. Nonetheless, many of those actions, especially those concerned with innovative financial engineering (typified here by Collateralised Debt Obligations based on extremely risky loans) were not neither banned nor illegal. Deregulation and a lack of adequate supervision by Regulators of the world’s leading capital markets allowed financial actors to extract super-profits by selling on these supposedly safe products, that were then sold on further into secondary markets hiding the underlying volatility of the loans behind a supposed top credit rating. The deregulation had been pushed by an intimate network of policy-makers and lobbyists, validated by economists pursuing these same free-market, laissez-faire lines.

These economists, holding teaching and researching places in several universities, seldom disclosed their financial relationships with financial firms, or financial groups of interest which had interests in such deregulation initiatives. These scholars also were invited, and accepted, public offices and decision-making or expertise roles. Although the direct causes of the global financial crisis cannot be attributed to economists alone, it seems that their impact on economic and financial policies, in the US and other places, was crucial for allowing a general climate of deregulation of dangerous activities. Critically, almost no economists that were predicting the toxicity of the assets and the consequences of the systemic failure were provided a platform for their findings.

Measuring & characterising Grimfact’s impact

For this study, the non-academic impacts of research around the ways in which research is taken up within society, through its encounter with users, its adoption by user communities and its incorporation into outcomes (Spaagen & van Drooge, 2011, Benneworth *et al.*, 2016) were characterised. The focus is specifically on those impacts that were; attributable to the original research article, or researcher’s body of work; emphasis on a change,

benefit/drawback and influence beyond academia; measurable and comparable, with a preference for indicator-level evidence; and/or verified through independent evidence/ and or research.

To produce these grimpact characteristics case study analysis was grounded in the analysis of the influence of the research, beyond academia that had had an extraordinary effect. The categories were developed independently during the analysis of each case, and then drawn out and compared between cases. The characteristics emphasised an “effect”, rather than through the mapping of micro impacts that underpins models such as SEP, SIAMPI and the ReACT models (Spaapen & van Drooge, 2011). To focus on the outcome/change/effect-driven model of impact was also necessary in this study in order to examine the ex post characteristics of the impact pathway. However, future studies will broaden this conceptualisation and not be restricted by this view and instead should encompass a broader, interaction/micro impact view and is grim characteristics, towards a clearer conceptualisation of grimpact.

Results

In each case study, the analysis was restricted to first order, direct effects rather than the second- and higher-order effects that may have been enabled by the first order effects produced. Analysis allowed to distinguish grimpact into four overarching headings, namely the violation of normal impact, the diffusion of attribution, academic transgressions and its contagion effects. More information is provided below as well as summarised in the Table 1.

Violation of normal impact

In line with Sivertsen’s (2018) distinction between normal and extraordinary impact, “normal” impact is found in the responsible relations between academic and other, non-academic organisations. These relationships exist for the pursuit of the research but nevertheless through interactions with and spillovers to societal stakeholders, there is an impact produced as a direct consequence of the conditions necessary for the research. By undertaking issues on societal subjects with societal subjects, research outcomes are readily and seamlessly available for implementation by these collaborating, non-academic organisations. Grimpact is characterised by the absence of this normal impact emerging, and the distinction between the researchers and the subjects of the research.

This is arguably most clear in the ETFC case, where ongoing interactions between research and their respective stakeholders suggested that it would be expected that normal impact would be created. However, because of the absence of blame placed at the door of those economists who had been involved in enabling the crisis, there was no feedback from the crisis situation to the academic discipline, hindering economics own attempts to come to terms with its own conceptual, theoretical and methodological shortcomings in which a focus on the mechanisms of market processes had obscured the wider systemic risks that might emerge from this.

Part of the absence of this normal impact arises from the presence of research misconduct, which through a manipulation of details or excessive framing and omission of putatively relevant variables a desirable set of results are arrived at. This was seen in both the CA and

MMR cases, and under conditions of research misconduct this coupling and feedback mechanisms were also violated, leading to a breakdown of normal impact and ultimately enabling the Grimpect. This resonances with Sivertsen (2018)'s argument that research misconduct could also potentially have an impact.

Attribution (aka allocating blame)

Whereas attribution is a widely discussed limitation in impact evaluation studies, the same also applies to grimpect. In two of the cases (CA and MMR), the grimpect and therefore the accountability could be attributed directly to one individual publication, limiting the ability to analyse the individual research behaviour that is characteristic of grimpect. However, in the CA case at least, a number of papers published by the researchers at the fore of the CA grimpect were identified, it was not clear what characteristics of the papers, independent of the behaviour of the researchers, led to the negative social consequences. A device was created which was in the first instance intended to be positive, to enable individuals to contribute to scientific endeavours by making their own personal data available to researchers. At some point, this was then commercialised to create a device which was invisible to the services and which harvested their data and also tailored content to them in ways that made them most receptive to the messages of the broadcasters.

Likewise in the ETFC case it is actually much easier to attribute the critique of ETFC than to the creators of it – by critique we are here thinking of Nassim Nicholas Taleb's Black Swan. ETFC operated as an enabling herd instinct in which academic research justified irrational exuberance in the finance markets and framing that irrational exuberance as reasonable. What was anomalous behaviour was regarded as normal, encouraging a shift in the academic science towards regarding these irrational anomalies as being rationally produced, and ultimately leading towards a set of false understandings and conceptualisations in the field as a dominant ideology between researchers and stakeholders. The effect was so diffuse that it is extremely hard to say at which point the assumption-making of efficient markets became an irrational dogma that led to the financial crash.

Transgressing boundaries between academic and entrepreneurial conduct

A third common characteristic seen in each case was that the degree of research misconduct occurred, and it was through the transgression between acceptable academic and non-academic behaviours that grimpect was created. Therefore, capacities that existed under strict ethical controls and with particular framings and limitations were freed from those limitations and were used to produce that grimpect. This suggests that a key characteristic of grimpect is that emerges as the result of transgressive behaviours by individuals (At odds with the supposedly prevalent ethical norms of the scientific communities), rather than an innate characteristic of the research, and that its spread is not necessarily serendipitous.

In the MMR case, the misconduct (both ethical and procedural) lead to all authors of the original article (except Wakefield) ultimately to accept their culpability and to retract the paper. Following the failure to replicate the results, and the backlash from the academic community surrounding the supposed misconduct coupled with the devastating effects of what could be regarded as unsubstantiated claims, the *Lancet journal* issued a formal

retraction in 2010. Nonetheless, Wakefield continues to claim the veracity of the study especially to anti-vaccination advocacy groups, and the grim pact in terms of the reduced vaccination levels.

In the CA case, however, the academic backlash has, at least for now, contained the grim pact. Here the academic misconduct of ethical mismanagement of personal information, as well as the use of social media profiles to influence behaviour has stimulated the creation of a reactionary regulations designed to ensure that such misuse in similar studies is acknowledged in assessments of ethical risk to participants. In addition, Facebook has since withdrawn their support for CA and a higher burden of risk has been applied to researchers wanting to access Facebook data for research purposes.

The degree of academic misconduct in the ETFC case is more nuanced. Here, as with all the cases, the grim pact was behavioural, but related to way that the ongoing relationships between researchers and stakeholders exerted a wider steering effect on the academic field as a whole that in turn reinforced and justified that core community. The temporary successes of these financial instruments gave strong signals to non-involved researchers that market-working and risk-dilution were functioning mechanisms rather than temporary bubble characteristics sustained by this irrational exuberance. Carrick-Hagenbarth & Epstein (2012) found that 15 of the 19 economists in the study, or almost 80%, worked in some capacity with private financial institutions. Over the period of 2005 through 2009 of these 15 economists with private financial affiliations, 13 did not disclose these ties in any of the academic publications we reviewed. Of these 15 economists, 11 had general media articles, interviews or testimonies; and of these 11, 8 failed to disclose any private financial affiliations.

The contagion of Grim pact

In all three case studies, the contagion of grim pact was both fast and broad, invading other fields (interdisciplinary) and extending beyond the primary geographical scope of the initiating researcher and stakeholder interactions. In part, that was due to the 'eye-catching' nature of the construct and the ease within which it could be used by others who were not necessarily cognisant of the background. The MMR case played to the more general parents fear of doing harm to their children, with inoculation raising the risk of sinning by commission, rather than the apparently less risky omitting to have one's child vaccinated. The CA case progressed quickly when the proposal was developed to weaponise the created capacity, transforming the apparently positive co-creative contributory tool into a weapon in the information war. In ETFC, the researchers had apparently found the 'golden egg' of finance by apparently allowing financial engineering to reduce the risk profile of junk investments (such as the predatory no income, no job, no asset mortgages) bringing with it the possibility for returns without risks.

The time of impact is more difficult to pinpoint as in many cases the grim pact is ongoing or indeed as with the case of CA has only just been exposed. In addition, the 'zombie' nature of grim pact was present, where it would be expected that the MMR crisis having been launched by a publication in the Lancet that a retraction would stop the negative consequences. This was not the case, and indeed led to the creation or at least empowering of vaccine denialist

communities increasing its overall impact by the decreasing the number of vaccinations taking place and the corresponding increase in cases of childhood MMR (Harmon, 2010).

Discussion

This paper provides an initial analysis of the characteristics of negative impact (Grim pact) in three well-known cases. A number of commonalities were found that can be used to drive future studies in this area. A greater recognition that research impact can be grim (sic) is increasingly important in light of the academy's drive to evaluate the ex-ante, as well as ex-post impact alongside the academic merits of research.

If in normal evaluative circumstances, accountability is the aim of mapping impact to both hold researchers accountable (reward) for the use of public funds as well as incentivise societally focused research, then the same ideals should apply to Grim pact. By acknowledging Grim pact (its existence as well as characteristics) prior to its realisation, there is an opportunity to hold researchers accountable. The extent that this is possible, however, is limited to recognising those activities and behaviours that can be monitored and measured. This is a common problem in impact evaluation as well, but for Grim pact as the three case studies have shown, there is an opportunity to hold researchers accountable by acknowledging that several common academic misbehaviours contribute to non-academic grim pacts as well. This includes consequences from research misconduct, and the alignment efforts such as engaging research end-users and stakeholders. Indeed, the loss of control over the trail of involved stakeholders and ownership of data and results was also characteristic in our three described cases of grim pact (MMR and CA).

Limitations of this brief introductory exploration include a degree of satisficing that determines the extent that the case study approach is able to determine the extent of each case's grim pact. As an initial analysis, however, this study provides a first step towards recognising that research has a broader influence beyond academia and that not all of these are worthy of celebration as part of the academy's dominant rhetoric of the value of the greater societal value of publically funded research.

Table.1: Summary of the characteristics of Grimpact in three case s

	Measles, mumps and rubella combined vaccine (MMR)	Cambridge Analytica (CA)
Public/private fraud	All authors of the original article have since renounced the study, except for Wakefield who continues to profit from his association with the paper (Godlee, 2011).	Used social media data beyond the contract guidelines of use.
Lost control of use		Colleagues registered company name, using the results, without the knowledge of the original researcher.
Had a negative intended effect	Influenced vaccination rates, that led to a rise in MMR cases, and deaths (Napier et al, 2016; Suk & Semenza, 2011)	Research if misused, posed <i>“a threat to individual’s well-being, freedom or even life”</i> (Kosinski et al, 2013)
Scientific misconduct	Original 2005 article, retracted from The Lancet due to scientific misconduct (Deer, 2011)	Compromise of research ethics due to the misuse of private, personal details.

			to identify their private affiliations were analysing financial regulatory issues that might affect the private firms in which they work.
Unnaturally influence public (campaigns/public opinion)		Links to Steve Bannon, and Russian influences on election campaigns in Europe, US and UK.	Strong influence over public opinion and policy makers Carrick-Hagenbarth & Epstein (2012).
Silenced “experts” (actively or not)	Decrease in public trust in evidence (Salmon et al, 2015; Stroud, 2003)		Carrick-Hagenbarth & Epstein (2012) showed that it is rare for academic financial economists to identify their private affiliations were analysing financial regulatory issues that might affect the private firms in which they work. Economists that used contrary theories and studies were not valued as highly, as those theories used by economists who has close connections with financial stakeholders (Cohen, The New York Times, 2009).
Tension between political versus scientific value			No tension. Shared political and scientific ideological ideas
Value linked with political ideology	More conservative political ideologies less likely to vaccinate citing vaccine safety fears and distrust in experts. (Baumgaertner et al (2018); Rabinowitz et al, 2016	The use of the data is currently under investigation for its use to unduly influence public opinion in the Brexit referendum and the 2016 US presidential election.	
Disproportionate research focus based on disease burden			
Establishment of anti-evidence advocacy groups	Post- publication establishment of anti-vaccination groups, which promoted studies that, supported their agenda, and not others. (Blume, 2006)		Advocacy groups established to develop proposals for the regulation of financial markets. In addition, many of these economists also wrote for the media on financial regulation (Carrick-Hagenbarth & Epstein, 2012)
Establishment of false economies and/or public campaigns	Advocacy group focused with on how to “green our vaccines” due to public fears of vaccine safety (Wessel, 2017)		

<p>Changed ways of thinking</p>	<p>Parents give greater weight to risks of vaccines than benefit (Baumgaertner, 2018)</p>	<p>Has contributed to the understanding and conceptualisation of “information warfare”</p>	<p>The Global Financial Crisis was a much broader and more dangerous closer; it popularised the phrase “systematic risk” to acknowledge the potential impact of the collapse of some firms and on the entire economic system Wilson & Grant, 2012, p. 1)</p>
<p>Influenced high level government debate through decrease in trust</p>	<p>During the 2016 US election, republican candidates publicly expressed a level of scepticism over vaccines, citing Wakefield (1998). These include the Presidential candidate Donald Trump (Knopf, 2017)</p>		<p>Influenced high-level government debate, which was largely due to mutual trust and shared ideology Carrick-Hagenbarth & Epstein, 2012)</p>
<p>Contributed to increasing inequality in society</p>			<p>The Global Financial Crisis (GFC) has been the most severe international economic crisis since the Great Depression, and resulted in a recession that has led to high levels of unemployment in the United States and most European countries (Wilson & Grant, 2012)</p> <p>The GFC had impact on employment rates, housing, GDP, exchange rates, and other socio-economic indicators (see Zestos, 2016, for overview of USA and some European countries)</p>
<p>Conflict of interest between the researcher and direct stakeholders</p>	<p>Wakefield used the ensuing public scare for private financial gain that were not in the public’s interests (Deer, 2011)</p>	<p>Passed the data collected onto a third party (Christopher Wylie of Eunoia Technologies, Inc) for personal financial gain through his company</p>	<p>No conflict of interest with direct stakeholders (policy makers, private and public financial corporations), on the contrary, it looks more like research-driven on behalf of those stakeholders (Carrick-Hagenbarth & Epstein ,2012). The conflict of interest is with indirect stakeholders, such as taxpayers, consumers, voters, and the public in general</p>
<p>Rectified the situation</p>	<p>No. Wakefield lost his medical licence but is still active in promoting vaccine scepticism globally (Deer, 2011).</p>	<p>Yes. Kogan has been banned from Facebook, and all data handled by Kogan and Wylie has since been “destroyed”</p>	<p>Many academic economists in the study have recently posted statements of disclosure of their private affiliations on their academic web sites (Carrick-Hagenbarth & Epstein ,2012). several economists refer readers of their journal articles to their public disclosure statements, groups provided lists with its many</p>

			members and their many affiliations. Other rectification (such as changes in the dominant university textbooks of Economics) have not happened (Cohen, The New York Times, 2009)
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