

Section A		
Institution: Durham University		
Unit of Assessment: UoA: 30 Philosophy		
Title of case study: Evaluating effectiveness		
Period when the underpinning research was undertaken: 2012 to December 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Nancy Cartwright	Role(s) (e.g. job title): Professor of Philosophy	Period(s) employed by submitting HEI: 2012 to present
Period when the claimed impact occurred: Between August 2013 and December 2020		
Is this case study continued from a case study submitted in 2014? N		
Section B		
1. Summary of the impact		
<p>Cartwright's research is shifting thinking and practice in the evidence-based policy movement from its focus on randomised controlled trials (RCTs) to more context- and user-centred approaches that make use of additional methods and information to improve policy-effectiveness, evaluation and prediction. This is transforming the policy landscape in four key areas.</p> <ul style="list-style-type: none"> • International development: e.g. in the government's Department for International Development's (DFID's) Centre for Excellence for Development Impact & Learning (CEDIL) • Medicine: e.g. in the UK Academy of Medical Sciences' <i>Sources of evidence for assessing the safety, efficacy and effectiveness of medicines</i> • Education: Uptake of ideas from Cowen and Cartwright's <i>Making the Most of the Evidence in Education: A Guide for Working Out What Works...Here and Now</i> • Child protection: writing with the author of the United Kingdom government's 2011 <i>Munro Review of Child Protection</i> 		
2. Underpinning research		
<p>The bulk of Cartwright's philosophical research has been devoted - through her 'Knowledge for Use' grant - to changing the thinking of those within the 'evidence-based policy' (EBP) movement. This influential movement aims to improve public policy by taking a systematic, evidence-based approach to decision-making. It is now highly influential, involving 11 'What Works' Centres in the UK including The National Institute for Health and Care Excellence (NICE), the World Health Organization (WHO) and the USA Department of Education 'What Works Clearing House'.</p> <p>Within the EBP movement, thinking and practice about the relationship between evidence and policy is almost universally 'intervention-centred', focussing on randomised controlled trials (RCTs) and meta-analyses. Cartwright's research on causal inference advocates a shift in thinking to a more 'context-centred' approach that makes use of additional methods and kinds of information. The research concerns what kinds of information can provide reliable inference about causation, especially in policy settings. The principal results are: 1) An analysis of possible roles of RCTs [R1]; 2) an account of types of evidence for causation in the single case [R2]; 3) an analysis of the role of mixed methods, middle-level theory and process tracing [R3] ; 4) an account of what constitutes a good scientific model for causal prediction, resulting in a more usable and predictively effective theory about the form of 'theories of change' [R4]; 5) the development of a context- versus intervention-centred approach to policy-effectiveness, evaluation and prediction [R5].</p>		

Together these research strands provide a new way of looking at how evidence should be used in deliberating policy effectiveness that is beginning to have effects within the EBP movement, in getting advocates and institutions to lay more stress on *moderator* (or *support*) *variables*, *interrupters*, *off-setters* and the middle-level principles that govern the production of one stage from the previous, on using and synthesising a greater variety of methods for stabilising evidence for policy effectiveness, and on guidance for building context-local causal models. These are general lessons that hold across substantive domains from development policy to medicine to education, in all of which excessive emphasis has been put on RCTs at the expense of the social, economic and political information necessary for reliable policy prediction.

The underpinning research is reported in a bundle of closely interrelated works on evidence for deliberation and evaluation in the policy arena. It consists primarily of analysis, including case studies, with results published in professional papers, conference talks, committee reports and in 1-on-1 work with individuals.

3. References to the research

- [R1] Cartwright, N. & Deaton, A. (2017). 'Understanding and misunderstanding randomized controlled trials'. *Social Science & Medicine*. 210: 2–21. DOI: 10.3386/w22595
- [R2] Cartwright, N. (2016). 'Single Case Causes: What is Evidence and Why'. In H. Chao, S. Chen and J. Reiss (Eds.), *Philosophy of Science in Practice: Nancy Cartwright and the Nature of Scientific Reasoning*. Dordrecht: Springer, pp. 11-24.
- [R3] Cartwright, N. (2019). 'Why Mixed Methods Are Necessary for Evaluating Any Policy'. In M. Nagatsu and A. Ruzenne, (Eds.), *Contemporary Philosophy and Social Science: an Interdisciplinary Dialogue*. London: Bloomsbury, pp. 173-184.
- [R4] Cartwright, N. (2020). 'Lecture 2. Casual Chain Models & Theories of Change.' In 'Middle-range theory: Without it what could anyone do?' *Theoria* 35.3: pp.285-302. DOI: 10.1387/theoria.21479
- [R5] Cartwright, N. (2019). *Nature the Artful Modeler: Lectures on Laws, Science, How Nature Arranges the World, and How We Can Arrange It Better*. 'Lecture 3'. Chicago: Open Court.

Evidence of the quality of research: During the current REF cycle Cartwright has won two of the most prestigious lifetime achievement philosophy prizes: The 2017 Leibowitz Prize for Philosophical Achievement and Contribution (American Philosophical Association) and the 2018 Hempel Award (Philosophy of Science Association). In 2016 Cartwright was elected a Fellow of the Academy of Social Sciences. She is frequently invited to give talks at philosophy, social science and policy events. She has been awarded a European Research Council Advanced Grant for the project 'Knowledge for Use' (grant number Ares (2015) 2008134 - ERC-2014-AdG - 667526_K4U; value GBP1,809,596.30).

[R1] is published in a peer-reviewed journal, has been cited more than 650 times (Google Scholar, accessed July 2020) and is the subject of a special issue of the journal *Social Science and Medicine* (vol. 210, 2018). [R2] and [R3] are published in refereed edited collections published by international academic presses, and one of the collections is dedicated to examining Cartwright's work. [R4] and [R5] are published versions of prestigious named lectures (Lullius Lectures and Carus Lectures respectively).

4. Details of the impact

The impact of Cartwright's research is on EBP advocates and practitioners; social scientists whose work intersects on-the-ground policy; and those who make and/or implement policy, especially in international development, medical sciences, education and child protection. Cartwright's research has shifted the thinking that guides their practice from an intervention-centred approach to a more context-centred one. This has been achieved through her work with international research centres, national academies and through presentations at social science and policy venues [E1].

1. International Development

The Centre of Excellence for Development Impact and Learning (CEDIL) is an independent international research centre established to improve impact evaluations and evidence

synthesis in international development. It was funded in 2017 by the UK Department for International Development (DFID) to commission GBP10,000,000 of research in three areas. One area, 'Generalising evidence through middle-range theory' was chosen in part because of Cartwright's defence – through her role on CEDIL's Intellectual Leadership Team – of its importance for policy evaluation, following research reported in [R4]. This resulted in the following CEDIL publications and policy documents (all [E2]), based primarily on Cartwright's research on middle-range theory (MRT) from [R4] and context-centred prediction (CCP) from [R5]:

- 'Making Predictions of Programme Success More Reliable', Cartwright's work on MRT formed the basis for this publication, commissioned to set the model for the empirical projects to be funded by CEDIL. [E2]
- 'Using Middle-Level Theory to Improve Programme and Evaluation Design'. This CEDIL-commissioned publication uses Cartwright's work on MRT to specify guidelines for subsequent programme evaluation and design. [E2]
- 'Designing evaluations to provide evidence to inform action in new settings'. This policy document defends the need for MRT, and offers a discussion of the importance of (Cartwright's idea of) 'markers', following [R5]. [E2]
- 'Stakeholder Engagement for Development Impact Evaluation and Evidence Synthesis'. Cartwright's research on CCP influenced the discussions of 'local knowledge' in this policy document. [E2]
- 'Gaps in Evaluation Methods for Addressing Challenging Contexts in Development'. One of the two central themes in this policy document is the importance of MRT. This publication also cautions about external validity and the problems in understanding mechanisms outlined in [R4]. [E2]

Testimonials by CEDIL associates further evidence Cartwright's influence on CEDIL's leadership team and policy documents: "CEDIL is a multi-disciplinary project but we had no one with a philosophy of science background, and certainly no one with Nancy's stature... Nancy became a core team member... Nancy's contribution... led us to focus on a middle range theory (MRT) approach. MRT is emerging as a strong part of CEDIL's brand, which I strongly doubt would have been the case without Nancy's involvement. The better designed evaluations and reviews which can result from this approach, and the better use of the evidence they provide, will enable implementers to design interventions which are more likely to have the desired effect. Better studies, better policies and programmes and better lives." [E3].

In addition to her work with CEDIL, individual statements by development EBP practitioners provide further evidence to support the breadth and significance of Cartwright's influence within international development. A member of the board of Civil Society group, INTRAC, an adviser to Self Help Africa, and developer of the Qualitative Impact Protocol (QuIP), explained: "Nancy has been a helpful source of ideas and advice in development and more particularly commercial testing of [QuIP]." [E3]

Additionally, the lead Social Scientist in Development Research at the World Bank comments on: "... the many and varied ways in which Nancy's mind, words, temperament, wisdom and presence has found practical application in the world of international development." Especially significant, he writes, are "Nancy's co-authored papers with economist and Nobel Prize winner Angus Deaton [R1] on the (many) limits of randomised controlled trials (RCTs)... This combination of 'star power' has been central to delimiting the otherwise unbridled, uncritical and unwarranted enthusiasm... for a narrow, singular approach to research, causal inference and (thus) applications to policy and practice." [E3]

2. Medicine

Cartwright was invited to serve on a working group of one of the UK's 4 national academies, the *Academy of Medical Sciences*. This is an independent body, funded by grants from the Departments of Health, and Business, Energy and Industrial Strategy. Their mission is to

advance biomedical and health research and to more effectively translate that research into social benefit. Cartwright's work on RCT's - in particular [R1] - contributed directly to the final report of their 'Methods of Evaluating Evidence' working group concerning the efficacy and assessment of medicines [E4]. The committee chair stated that: "[Cartwright's] writings have certainly influenced my thinking about causation when applied to practical problems... [E]veryone on the working party producing the 2017 report learnt a lot about the practical implications of the theoretical issues. We came to think differently about things as a result of what Nancy Cartwright had to say." [E5]

In addition to her work with the Academy of Medical Sciences, Cartwright has also worked extensively with a psychotherapist -- CBE, adviser to the government on evaluating the effectiveness of psychological therapy services, national expert adviser to NICE on depression, and research evaluator on the Greater Manchester *Working Well* Programme – who has used Cartwright's work on the limits of RCTs [R1] and on the importance of mixed methods for establishing effectiveness [R3], to argue both at NICE and with the government's Work and Health Unit for a broader approach to evaluating treatment effectiveness, as well as in devising an evaluation study of *Working Well*. He comments: "The work I have been able to do with the support of Nancy's research is being seen by policy makers and leaders in the professional and research field as some of the most important research in mental health in the UK." [E5]

3. Education

With Nick Cowen, Cartwright published *Making the Most of the Evidence in Education: A Guide for Working Out What Works...Here and Now* [E6]. This guide uses Cartwright's work on evidence and the evaluation of policy - [R2], [R3], [R5] - to advise practitioners on the use of research evidence about education. This guide has impacted education policy through its use by the Education Endowment Foundation (EEF). The EEF is an independent charity, founded by the Department of Education in 2011 with a GBP125,000,000 grant aimed to help raise standards in challenging schools by using the best available research and evidence to raise attainment and close the disadvantage gap. Their 2017 annual report into improving literacy in Key Stage 2 [E4.2] – targeted at teachers, senior leaders and educational professionals – uses Cartwright and Cowen's [E6] in providing advice on the applicability of structured programs based on research-evidence for targeted interventions (in the specific context of helping pupils who are struggling with literacy).

The use of Cartwright's research to inform education policy has also enjoyed international reach. With Kathryn Joyce, Cartwright published 'Bridging the Gap Between Research and Practice: Predicting What Will Work Locally' [E8]; an application of Cartwright's work on evidence and prediction and RCT's, [R2] and [R5] to the evaluation of research evidence in education policy. This led to a consultation with Cartwright and Joyce by the head of the US 'What Works Clearing House', which is a Centre of the Institute of Education Sciences, in the US Department of Education. The impact of Cartwright's research in the US is further evidenced by the testimony of the former head of the US National Research Council's Division of Behavioral and Social Sciences and Education:

"[Cartwright's] work has been among the crispest, most influential, and most relevant... on topics ranging from public health to climate to economic and social welfare to education... Nancy has established herself as a "go-to" authority on anything related to the nature of inference, the connection of causal reasoning to ex ante planning and ex post evaluation, and to the benefits and risks of either ignoring or overstating findings from scientific research. As a practitioner of evidence, all this matters to me greatly... I have been working in the hazardous intersection of research and practice for nearly 4 decades, with 24 years divided between a scientific arm of the US Congress and the National Academy of Sciences. In the former agency (the now defunded Office of Technology Assessment), I was study director for projects on topics of education, psychological testing, and learning technology; at the NAS I founded the Board on Testing and Assessment and eventually became the Executive Director of the Behavioral and Social Sciences and Education Division... Now when I

consider starting a new project that calls on research to inform policy or practice, one of the first people I call on – for advice or participation – is of course Professor Cartwright.” [E9]

4. Child protection

Cartwright’s work on evidence evaluation and policy - [R2], [R3] - led to the publication, with Eileen Munro, Jeremy Hardie and Eleonora Montuschi, of *Improving Child Safety: deliberation, judgement and empirical research* [E10] (a guide for those working in child protection and child welfare to deliberate about interventions using the available evidence). This has heavily informed a leading child protection expert and government advisor’s (-- CBE) pioneering work with an international child-protection programme, *Signs of Safety* (SoS), that focuses on partnerships between professionals, families and children: “Developments in the theoretical foundations of Signs of Safety have been influenced by... Nancy’s work on causal processes so that the Theory of Change now covers both the direct work with families and the organisation’s contribution to the performance of the front line worker. Nancy’s work on support factors, detractors and derailers provided the conceptual framework for measuring the individual local authorities’ progress on implementing the reforms and explaining the markedly different levels of practice achieved.” [E10]. SoS has now been implemented in more than 100 jurisdictions worldwide, and is used in approximately two-thirds of local authorities in England and nationwide in Ireland in 2017 following a Department of Education Funded (GBP4,600,000) ‘Innovation Programme’.

5. Sources to corroborate the impact

[E1] Talks at practitioner and policy venues (e.g. House of Lords, University of Oxford).

[E2] CEDIL policy documents: N Cartwright, L Charlton, M Juden, T Munslow, R Beadon Williams, ‘Making Predictions of Programme Success More Reliable’; N Cartwright, ‘Using Middle-Level Theory to Improve Programme and Evaluation Design’; Davey C, Hargreaves J, Hassan S, Cartwright N, Humphreys M, Masset E, Prost A, Gough D, Oliver S, Bonell C, ‘Designing evaluations to provide evidence to inform action in new settings’; S Oliver, C Roche, R Stewart, M Bangpan, K Dickson, Ki Pells, N Cartwright, D Gough, J Hargreaves, ‘Stakeholder Engagement for Development Impact Evaluation and Evidence Synthesis’; Davey, C., Hassan, S., Bonell, C., Cartwright, N., Humphreys, M., Prost, A., Hargreaves, J, ‘Gaps in Evaluation Methods for Addressing Challenging Contexts in Development’, *CEDIL report policy document*.

[E3] Testimonials from: the Director of CEDIL; a member of the board of Civil Society group, INTRAC, adviser to Self Help Africa, and developer of the Qualitative Impact Protocol (QuIP); the lead Social Scientist, Development Research, at the World Bank.

[E4] *Sources of evidence for assessing the safety, efficacy and effectiveness of medicines*. Final Report of the Academy of Medical Sciences, 2017.

[E5] Testimonials from: the Committee Chair of the Academy of Medical Sciences; psychotherapist, governmental advisor, national expert advisor to NICE and research evaluator on the Greater Manchester *Working Well* Programme.

[E6] N, Cowen, N, Cartwright, *Making the Most of the Evidence in Education: A Guide for Working Out What Works...Here and Now*, Working paper of *Centre for Humanities Engaging Science and Society*, 2016.

[E7] Education Endowment Foundation *Improving Literacy in Key Stage 2*, 2017.

[E8] Joyce, K and Cartwright, N. ‘Bridging the Gap Between Research and Practice: Predicting What Will Work Locally’, *American educational research journal* 2019.

[E9] Testimonial from former head of the US National Research Council’s Division of Behavioral and Social Sciences and Education.

[E10] Munro, E, Hardie, Montuschi, E, Cartwright, N, *Improving Child Safety: deliberation, judgement and empirical research*. Working paper of *Centre for Humanities Engaging Science and Society*, 2016; Testimonial from Child protection expert and government advisor.