

Institution: University of Southampton		
Unit of Assessment: 04 Psychology		
Title of case study: 04-03 Advancing multimodal evidence-based treatment of ADHD worldwide		
Period when the underpinning research was undertaken: 2000 – 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Samuele Cortese	Professor	January 2015 – present
Margaret Thompson	Honorary Professor (Cat C)	April 1997 – present
Jana Kreppner	Associate Professor	October 2007 – present
Edmund Sonuga-Barke	Professor	December 1997 – December 2016
Catherine Thompson	Research Fellow	November 2014 – September 2019
Period when the claimed impact occurred: August 2013 – July 2020		
Is this case study continued from a case study submitted in 2014? N		
<p>1. Summary of the impact</p> <p>Attention-Deficit/Hyperactivity Disorder (ADHD), the most commonly diagnosed neurodevelopmental disorder, affects around 5-7% of children. A comprehensive management strategy for individuals with ADHD should include pharmacological and non-pharmacological (e.g., parent training) approaches. Annual costs of untreated ADHD in the UK have been estimated at GBP670 million. The Department of Health and Social Care has expressed concerns over the management of this condition in the UK, which fails to be evidence-based in many clinical settings. The ADHD research programme at the University of Southampton has generated the most rigorous body of evidence synthesis available worldwide on the treatment of ADHD, which has:</p> <ol style="list-style-type: none"> 1. Informed international clinical guidelines (e.g., from the American Academy of Pediatrics, 67,000 members), including the recent European guidance for ADHD management during the pandemic, and increased awareness of evidence-based practices among clinicians (e.g., around 2000 members of the World Federation of ADHD) and patients (e.g., from <i>ADHD Europe</i>, including 28 organisations from 23 countries) worldwide; 2. Informed the development of a unique parent training strategy, the New Forest Parenting Programme (NFPP), which has been included in guidelines and recommendations both nationally and internationally, and has been tested and implemented in the UK and internationally. 		
<p>2. Underpinning research</p> <p>A first line of research on ADHD, led by Professor Samuele Cortese, has generated the most comprehensive evidence synthesis, at the international level, on the pharmacological and non-pharmacological ADHD treatment. This research activity has been conducted on behalf of the European ADHD Guidelines Group (EAGG), of which Cortese and Professor Edmund Sonuga-Barke are members. Regarding the pharmacological treatment, in 2015-2018 Cortese led a large-scale international project [3.1], which provided the first ever meta-analytic comparative evidence on the efficacy/tolerability of ADHD medications across the lifespan. The analysis in children focused on school-aged participants, given the ethical concerns around the use of medications in pre-schoolers. Sonuga-Barke co-authored a 2013 EAGG guidance paper on the management of side effects of medications for ADHD (led by Cortese before his arrival at Southampton) [3.2]. Another series of meta-analyses led by Sonuga-Barke, and co-authored by Cortese before and soon after his arrival at Southampton, focused on the non-pharmacological treatments, e.g. [3.3], showing that, whilst there is no solid evidence that these treatments improve ADHD core symptoms, they are efficacious for important related aspects associated with ADHD; for example, parent training was found efficacious for oppositional behaviours/conduct disorders symptoms that are often comorbid with ADHD. Informed by this evidence, a distinct but related line of research, the New Forest Parenting Programme (NFPP), led by Professor Margaret Thompson and Consultant Nurse (ADHD) Dr</p>		

Cathy Laver-Bradbury, aims to develop, test, and disseminate a non-pharmacological, behavioural parent training approach for children with ADHD, and their families. Currently, based on the evidence from the EAGG, NFPP focuses on non-core symptoms (i.e., conduct and oppositional problems) related to ADHD. In the past five years, the ADHD Southampton team, under the lead of Thompson, has expanded the breadth and scope of NFPP, showing its efficacy for pre-school children [3.4]. The team has also worked with colleagues internationally to develop NFPP versions for different cultures/languages, including USA [G1], Denmark [G2], Japan [3.5], Hong Kong, South Africa, India and China. These NFPP versions have been successfully tested in randomised controlled trials (RCTs) (e.g., [3.6]). Subsequently, a grant from the NIHR [G3] enabled the team to develop the NFPP to be an online parenting programme and to run a successful RCT pilot study. Based on parental reports, conduct problems improved significantly more in the treatment group compared to the control group (report to NIHR; Thompson et al., 2017). Subsequently, a Research for Capability Funding from Solent Trust NHS Trust supported a pilot study that led to a successful grant application to the NIHR [G4] for a five-year programme (OPTIMA; PI Sonuga-Barke; PI in Southampton: Dr Jana Kreppner; Cortese: co-investigator in Southampton) aimed to carry out a large multi-centre trial of a revised version of the NFPP online programme.

More recently, the ADHD Southampton group has also led the publication of the European guidance on the pharmacologic and non-pharmacological management of ADHD during the Covid-19 pandemic [3.7].

3. References to the research

- 3.1 Cortese S**, Adamo N, Del Giovane C, Mohr-Jensen C, Hayes A, Carucci S, Atkinson L, Tessari L, Banaschewski T, Coghill D, Hollis C, Simonoff E, Zuddas A, Barbui C, Purgato M, Steinhausen H, Shokraneh F, Xia J, Cipriani A (2018). Comparative efficacy and tolerability of medications for Attention-Deficit/Hyperactivity Disorder in children, adolescents and adults: a systematic review and network meta-analysis. *Lancet Psychiatry* 5(9):727-738. [https://doi.org/10.1016/S2215-0366\(18\)30269-4](https://doi.org/10.1016/S2215-0366(18)30269-4)
- 3.2 Cortese S**, Holtmann M, Banaschewski T, Buitelaar J, Coghill D, Danckaerts M, Dittman RW, Graham J, Taylor E, Sergeant J; European ADHD Guidelines Group: Banaschewski T, Brandeis D, Buitelaar J, Coghill D, Cortese S, Daley D, Danckaerts M, Dittmann R, Döpfner M, Ferrin M, Graham J, Hollis C, Holtmann M, Konofal E, Lecendreux M, Rothenberger A, Santosh P, Sergeant JA, Simonoff E, **Sonuga-Barke EJ**, Steinhausen H-, Stringaris A, Taylor E, van der Oord S, Wong I, Zuddas A, Sergeant J (2013). Practitioner review: current best practice in the management of adverse events during treatment with ADHD medications in children and adolescents. *Journal of Child Psychology and Psychiatry* 54(3):227-46. *Journal of Child Psychology and Psychiatry* 54(3):227-46. <https://doi.org/10.1111/jcpp.12036>
- 3.3 Daley D**, van der Oord S, Danckaerts M, Maite F, Döpfner M, **Cortese S**, **Sonuga-Barke EJ** (2014). The impact of behavioural interventions for children and adolescents with attention-deficit/hyperactivity disorder: a meta-analysis of randomized controlled trials across multiple outcome domains. *Journal of the American Academy of Child and Adolescent Psychiatry* 53(8):835-47. <https://doi.org/10.1016/j.jaac.2014.05.013>
- 3.4 Sonuga-Barke EJ**, Barton J, Daley D, Hutchings J, Maishman T, Raftery J, Stanton L, Laver-Bradbury C, Chorozioglou M, Coghill D, Little L, Ruddock M, Radford M, Yao GL, Lee L, Gould L, Shipway L, Markomichali P, McGuirk J, Lowe M, Perez E, Lockwood J, **Thompson MJJ** (2017). A comparison of the clinical effectiveness and cost of specialised individually delivered parent training for preschool attention-deficit/hyperactivity disorder and a generic, group-based programme: a multi-centre, randomised controlled trial of the New Forest Parenting Programme versus Incredible Years. *European Child & Adolescent Psychiatry*. Oct 30:1-3. <https://doi.org/10.1007/s00787-017-1054-3>
- 3.5 Shimabukuro S**, Daley D, **Thompson M**, Laver-Bradbury C, Lovern K, Tripp G (2020). Supporting Japanese Mothers of Children at Risk for Attention Deficit Hyperactivity Disorder (ADHD): A Small Scale Randomized Control Trial of Well Parent Japan. *Journal of Child and Family Studies* 29, 1604–1616. <https://doi.org/10.1007/s10826-020-01704-6>

- 3.6** Lange AM, Daley D, Frydenberg M, Houmann T, Kristensen LJ, Rask C, **Sonuga-Barke EJ**, Søndergaard-Baden S, Udipi A, Thomsen PH (2018). Parent training for preschool ADHD in routine, specialist care: a randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 57(8), 593-602. <https://doi.org/10.1016/j.jaac.2018.04.014>
- 3.7** **Cortese S**, Asherson P, **Sonuga-Barke E**, Banaschewski T, Brandeis D, Buitelaar J, Coghill D, Daley D, Danckaerts M, Dittmann RW, Doepfner M, Ferrin M, Hollis C, Holtmann M, Konofal E, Lecendreux M, Santosh P, Rothenberger A, Soutullo C, Steinhausen HC, Taylor E, Van der Oord S, Wong I, Zuddas A Simonoff E; European ADHD Guidelines Group (2020). ADHD management during the COVID-19 pandemic: guidance from the European ADHD Guidelines Group. *Lancet Child and Adolescent Health*, 4(6):412-414. [https://doi.org/10.1016/S2352-4642\(20\)30110-3](https://doi.org/10.1016/S2352-4642(20)30110-3)

Key Grants

- G1** PI Sonuga-Barke, NIHR (RP-PG-0108-10061), 2009-2014, GBP2,029,787 [ref. 3.4]
G2 PI Lange, TrygFonden Organisation, Denmark, 2012-2016, GBP1,000,000 [ref. 3.6]
G3 PIs Kreppner and Thompson, PDG from the NIHR (RP-DG-0614-10002), 2016-17, GBP99,000
G4 PI Sonuga-Barke, NIHR (RP-PG-0618-20003), 2020-25, GBP1,882,936

4. Details of the impact

Impact of evidence synthesis on national and international clinical guidelines

Due to its methodological rigour and comprehensive nature, the evidence synthesis on ADHD treatments has been influential to inform national and international clinical guidelines/policies. At the national level, in line with the evidence synthesis conducted by the EAGG [3.3], the NICE 2018 guidelines for ADHD [5.1] changed their recommendations, indicating parent training as an intervention for problems with oppositional behaviours associated with ADHD, rather than for ADHD core symptoms, as it was reported in the previous NICE guidelines. The 2018 network meta-analysis on ADHD medication [3.1] was selected by the NIHR as an “NIHR Signal” publication, which highlights research considered to contain the evidence most valuable to decision makers [5.2]. At the international level, this network meta-analysis has been crucial for a number of guidelines, such as those from the European ADHD adulthood network [5.3], the German guidelines (estimated to influence the practice of 20,000 professionals [5.4]), and the Danish guidelines, with the Danish Health Authority [letter, 5.5] stating: “*Without this valuable input, formulation of a recommendation had not been possible*”. The guidance paper on the management of side effects of ADHD medications [3.2] has informed the recent Guidelines on ADHD management by the American Academy of Pediatrics (67,000 members) [5.6]. Recently, The New England Journal of Medicine invited Cortese to summarise the evidence synthesis on ADHD in a review article, which in less than 3 months from its publication, has been viewed by more than 25,000 readers [5.7].

Impact of the New Forest Parenting Programme (NFPP)

The NFPP has shown tangible outcomes in randomised controlled trials (RCTs). In a RCT conducted in 2013 [3.4], the NFPP for parents of pre-schoolers was shown to be as efficacious as another commonly used treatment (*Incredible Years*) but significantly less expensive. NFPP was cheaper than group-based interventions for ADHD (IY) recommended by NICE (GBP1,591 vs. GBP2,103 per parent). In a RCT carried out in 2018, NFPP was superior to intensive treatment-as-usual within routine care in Denmark [3.6]. NFPP has been widely disseminated and implemented. The self-help book on NFPP has been purchased by over 3,429 parents since it was launched in 2014, with the Danish, Hebrew and Czech versions of the book being launched in the same year. The book is available for sale on Amazon and currently has 40 reviews and 4.5 out of 5 stars, with 71% reviews scoring 5/5 [5.8]. The number of therapists trained nationally and internationally continues to grow. Nationally, the Southampton team has trained groups of trainers in Nottingham, and then Newcastle, Mansfield, Richmond, Bromley, North Staffs, Isle of Wight, Jersey, Guernsey, which are adopting Nottingham city’s approach to embed the work in the community out of the CAMHS. 75% of the foster carers trained in Nottinghamshire stated that the “group changed the way they support your child” [5.9]. The

NFPP is also endorsed by the Early Intervention Foundation [5.10]. Internationally, training took place in Denmark and Japan [5.11] and, more recently, in China and soon Iceland. Furthermore, the NFPP is endorsed in the recent Guidelines on ADHD management by the American Academy of Pediatrics [5.6]. Additionally, NFPP set the groundwork to develop an online programme for parents of children with disruptive behaviours (PI: Prof. Sonuga-Barke, currently at Kings' College London) [5.12].

Overall impact of the Southampton ADHD group research activity on professionals and patients

The ADHD research activity in Southampton has been crucial to raising awareness of evidence-based practices among professionals, alongside families of children with ADHD and teachers, at the national and international level and has been defined as “highly influential in the field” by the Chair of the European Network for Hyperkinetic Disorders (Eunethydis) [5.13]. In an international survey of 103 professionals on the guidance for management of ADHD during the Covid-19 pandemic, 60% considered the Southampton-led European guidance as “very helpful” and 45% stated the guidance was endorsed/used by their work institution [5.14]. The President of ADHD Europe, a European network of 28 national associations of families with children with ADHD, stated the guidance “proved to be a very helpful resources and has been circulated to all our members” [5.15].

5. Sources to corroborate the impact

- 5.1 NICE 2018 guidelines on ADHD. Available at <https://nice.org.uk/guidance/ng87>: [3.3] is cited in reference 117 and contributed to provide the NICE Committee with relevant studies to be included in their own meta-analysis; New Forest Parent Training (NFPT) cited on pages 107 and 123.
- 5.2 <https://discover.dc.nihr.ac.uk/content/signal-000671/methylphenidate-remains-first-choice-drug-treatment-for-children-and-young-people-with-adhd>
- 5.3 Kooij et al. Updated European Consensus Statement on diagnosis and treatment of adult ADHD. Eur Psychiatry. 2019;56:14-34. <https://doi.org/10.1016/j.eurpsy.2018.11.001>. [3.1] is cited on page 22.
- 5.4 Impact on German guidelines (Letter Prof. Banaschewski, Central Institute of Mental Health, Germany).
- 5.5 Impact on Danish Guidelines (Letter Danish Health Authority).
- 5.6 Guidelines of the American Academy of Pediatrics: Wolraich et al. Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. Pediatrics. 2019;144(4):e20192528. <https://doi.org/10.1542/peds.2019-2528>. [3.2] is cited four times on page 14. NFPP is mentioned in reference #85.
- 5.7 Cortese. New England Journal of Medicine. 2020, 383(11):1050-1056. <https://doi.org/10.1056/NEJMra1917069>
- 5.8 Amazon reviews Step by Step Help for Children with ADHD (NFPP) <https://www.amazon.co.uk/Step-Help-Children-ADHD-Self-Help/dp/1849050708>.
- 5.9 Feedback parents Nottinghamshire on NFPP.
- 5.10 NFPP endorsed by the Early Intervention Foundation. <https://guidebook.eif.org.uk/programmes/the-new-forest-parenting-programme>
- 5.11 Letter Dr. Lange (Denmark) and Letter Professor Trip (Japan).
- 5.12 <https://familiesunderpressure.maudsleycharity.org/>
- 5.13 Letter from the Chair of the European Network for Hyperkinetic Disorders (Eunethydis).
- 5.14 International survey on the guidance for ADHD during the Covid-19 pandemic. <https://forms.office.com/Pages/DesignPage.aspx#FormId=-XhTSvQpPk2-iWadA62p2OcSwxan6xpMt6Z5JWGmwJIUQTQxRVZBVEdCTTJDWFZMWIcxSDEwQ1VJSi4u&Token=e01bda351e4c463898173bbe6bd183>
- 5.15 Letter from the President of ADHD Europe (families associations).