

## Michael Rutter and the birth of academic child psychiatry: some personal reflections on his scientific approach and contribution

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Michael Rutter's commanding position in academic child psychiatry is witnessed by many recent obituary publications in scientific journals about his seminal impact across the astonishingly wide areas of understanding, where he contributed an approach of rigorous empirical enquiry that left no room for easy generalization. Quite rightly, these publications have emphasised the ways in which Mike was a model of scientific diligence and the creativity and care which he applied to unravelling the complex causes of developmental process in childhood and adolescence that make one person different from another—making some vulnerable to poor mental health and disorder and others resilient. This notice differs from many of these because it presents the reflections of a number of Mike's close collaborators, and is informed by our personal acquaintance with the person, as well as with his work. We focus here on several areas of his impact on our field—child rearing, attachment and deprivation, epidemiology and genetics—of the many which we could have chosen.

It must first be noted that his scientific development included many rich experiences, the impact of which can be seen throughout his career. Mike's innate energy and intellectual curiosity were further developed in the challenging atmosphere of the Maudsley Hospital and especially under the guidance of Professor Aubrey Lewis, who created an intellectually questioning environment in which assumptions about the nature and causes of mental illness and observations about their clinical presentation were both viewed equally as nothing more than an opportunity for scientific

hypothesis development and testing. At the same time, visits to the US led to an appreciation of American know-how and ambitious science. These experiences combined with his sense of egalitarianism, instilled by his Quaker upbringing, served to create a distinctive clinical and scientific approach. They led him to robustly challenge over-simple formulations, liberating the field from imprisonment in a world view of received ideas and all-embracing "theories". Mike was especially adept at using observational data creatively to draw inferences beyond mere causation. This was most clear in the way he identified numerous opportunities to use natural experiments, whether provided through social policy, genetic processes or environmental events and exposures. His work was driven by a healthy scepticism of received ideas and fuelled by the testing of assumptions and hypotheses using his methodological ingenuity. He had a remarkable talent for identifying key questions that would be susceptible to rational enquiry. We highlight a few examples from his work that demonstrate his signature qualities and impact on our field.

Mike's own early childhood was disrupted by evacuation from the UK to the US during World War II, where he formed a close relationship with the family caring for him. Placed in this context of personal experience, it's not hard to see why much of his scientific work would explore the qualities of early experience within families that are necessary and/or sufficient to promote children's mental health and well-being. At the time of the start of his career, it must be remembered, Bowlby's theories of the pre-eminence of maternal attachment dominated psychiatric thinking about early emotional development and the roots of mental disorder. This led to the implication that mothers of young children should stay at home to care for them. Challenging prevailing wisdom, Mike carefully looked at the evidence, and found that an exclusive relationship with the mother was not essential for the child's healthy social and emotional wellbeing, but rather that sensitive and secure care could also be provided by other caregivers, and just as effectively,

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if the mother was not available. Likewise Mike showed that if a mother died during a person's childhood it was not the death itself that impacted developmental and mental health but rather the quality of care that ensued. His book *Maternal Deprivation Reassessed* (1972) was hugely influential and led to a widespread revision of social policy. Mike also noted that young children varied considerably in their responses to maternal deprivation, which led to a lifetime's interest in individual differences in the interplay between vulnerability, risk and resilience.

Many years later, Mike revisited this topic. Many readers will remember the broadcast images of the blank stares of the filthy and emaciated children in Ceaușescu's brutally depriving Romanian orphanages just after his regime's fall at the end of the 1980's. Some parents, from the UK and other countries, acting with practical generosity and courage, rescued these children and adopted them as their own. The British government realised that a sizable group of certainly vulnerable, but also potentially psychologically damaged, children had come to live in the UK and turned to Mike for practical advice on meeting their needs. Alongside this important practical work, Mike recognised that with careful planning some of the previous methodological problems in studies of deprivation could be overcome by combining the natural experiment created by these adoptions with the systematic and repeated observation of developmental outcomes in a longitudinal design. He identified the importance of accounting for duration of deprivation to establish if there was an effect of the "dose of deprivation"—thus strengthening causal inference—and of including an "optimal adoption group" of UK children placed before they were 6 months old. Critical was the developmental follow-up throughout childhood, adolescence and early adult life to establish the long-term effects. He, and his colleagues, found that an initial and almost universally devastating effect of deprivation seen soon after adoption gave way to the subsequent remarkable catch-up observed for most children, but also the strong persistence of a distinctive pattern of neuro-developmental problems including autism, ADHD and disinhibited attachment for many of them into adult life, with negative long-term outcomes consistently related to the duration of deprivation experienced.

Mike also made key contributions to our understanding of the epidemiology of mental health problems in the child population as a whole. Epidemiology is a core building block in the development of any clinical discipline: to make progress in our scientific understanding of a condition, or to plan services, we need to know how common that condition is in the population, and who is most at risk. At the time Mike began his career, even very basic knowledge of this kind was almost completely lacking in the child mental health field—so, characteristically, he decided that a first key task must be to fill that gap. Still in his early

30 s, he gathered together a team of collaborators, designed interviews and questionnaires to assess child mental health problems in community samples, and identified an area (the Isle of Wight, just off the south coast of England) where the population was large enough to provide reliable estimates of prevalence and where, equally importantly, the local authorities were supportive of his plans. Finally, to provide the army of data collectors needed to carry out the surveys, he persuaded his London-based colleagues that the one thing they would most love to do was catch the ferry and spend a month on the Isle of Wight, visiting families and interviewing parents and children. The result was a series of studies that laid the foundations of academic child psychiatry, and whose insights continue to resonate today. They showed that clinically significant mental health problems were common in childhood, and often overlapped with educational difficulties; that apparently distinct conditions such as conduct and emotional disorders themselves showed high rates of overlap; and that many of the family factors long viewed as risks for disorder in clinical settings were also robustly associated with them in community samples. These initial surveys focused on 9–11 year-olds, but Mike immediately recognized their potential as a jumping-off point for examining a much wider range of issues. First, following the developmental approach so central to his thinking, he returned to study these same children in adolescence, and was among the first to document the sharp rise in mental health problems that occurs in the adolescent years. Second, from a methodological perspective, he was aware of the need for replication—and in particular, the need to determine whether the individual and family risks identified on the Isle of Wight would also be associated with disorder in the very different conditions of the inner city. So was born the inner London comparative study—and with it, a range of new insights into risk and protective factors for child mental health emanating from influences beyond the family, whether in the conditions of urban living or, following a series of further studies, in the environments children encountered at school.

Mike also recognised early on the value of genetically-informed study designs to explore the causes of individual differences. Early in his career he turned to the challenge of autism, at that time thought to be due to by rearing by 'refrigerator parents'. Mike undertook the first twin study of autism comparing identical and fraternal twins and showing large differences in MZ-DZ concordance rates, which revolutionised the thinking and research about autism causation. Once again, understanding the importance of replication, he extended these findings with a larger twin study that demonstrated how genetic factors are not deterministic but rather increase liability for a range of social and cognitive impairments, of which autism is the extreme end of the continuum. More broadly, Mike embraced genetically informed designs as a strategy to interrogate a wide range of issues in

developmental psychopathology. He had little patience for purely descriptive studies of the heritability of different traits but rather aimed to explore the mechanisms underpinning gene-environment interplay. Working with leading scientists worldwide, he used twin, adoption, family and assisted conception studies to explore many questions. Examples include: demonstrating that both gene-environment correlation and gene-environment interaction contribute to the increase in depression during adolescence; showing that adverse parenting strategies increase childhood behaviour problems, independently of genes; and confirming that prenatal smoking increases offspring ADHD via genetic rather than environmental pathways.

Mike worked with and trained many scientists at the Maudsley and internationally. His incisive intellect was renowned and the high standards he set for others were matched by his expectations of himself. He not only challenged the prevailing views of the time but was also prepared to re-examine his own ideas, as witnessed by the apparent contradiction between his findings of genetic causality of autism and the autistic outcomes of extreme deprivation in

the English Romanian Adoption study. Those collaborating with Mike learned the value of critical questioning of their own assumptions and findings. Less well known is Mike's commitment to clinical care. He trained generations of clinicians at the Maudsley as well as many international visitors. The same qualities of sleuth-like enquiry applied to Mike's approach to clinical formulation, where trainees learned to make careful observations, ask difficult questions and examine their own assumptions. Well into retirement, Mike continued to follow up many childhood patients and research participants into adult life, for whom appropriate services were often difficult to identify, and to advocate for their needs.

It is not enough to have great thoughts—they should be transferred into enlightened action. Mike brought this about through luminous reviews of many fields, consulting to national and international agencies, and recruiting talented individuals. We count ourselves immensely privileged to have worked with him.