

Developments in Child and Adolescent Psychiatry Over the Last 50 Years

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State of Child and Adolescent Psychiatry 50 Years Ago

The development of child and adolescent psychiatry in the first half of the 20th century was well described by Achenbach (1974), Cameron (1956), Kanner (1959), Parry-Jones (1989) and Warren (1974) with respect to both its strengths and limitations. The establishment of community child guidance clinics, much influenced by the Mental Hygiene movement, had the value of viewing psychopathology in the context of young people's real-life circumstances. The cost, however, was that there was both geographical and professional isolation from general psychiatry, pediatrics and academic research. Most treatment tended to be very open-ended and prolonged, usually without a well-defined focus (Rutter, 1982a). There tended, also, to be a rigid separation in the functioning of the unholy trinity of the psychiatrist, the psychologist and the psychiatric social worker. In addition, there was a tendency to blame parents for the disorders of their children – as indexed by concepts of the schizophrenogenic mother (Jackson, 1960) and “refrigerator” parents (Bettelheim, 1967), in relation to schizophrenia and autism, respectively. The dominant theories were the several varieties of psychoanalysis (Eisenberg, 2001), clinical practice was mostly not evidence-based, and there was a paucity of specific treatments (Chess, 1988). Furthermore, very little attention was paid to diagnosis. The prevailing terminology concerned “maladjustment” and official classifications referred only to “behavior disorders of childhood.”

However, very important changes were afoot (Rutter, 1998). Although systematic diagnosis was not yet in fashion, Kanner (who wrote the first definitive English-language textbook in 1935) had already done much to foster critical thinking about different patterns of psychopathology and to encourage a questioning approach (as exemplified by his 1969 paper on differential diagnosis). Also, his first description of autism (Kanner, 1943) not only provided a model of top-level clinical observation, but established the reality of a disorder that was distinctively different from others. Similarly, approaching diagnosis psychometrically rather than clinic-

ally, Hewitt and Jenkins (1946) wrote a pioneering monograph identifying different patterns of psychopathology. The tide was beginning to turn with respect to both diagnosis and classification in both child and adult psychopathology (Meehl, 1954).

Although biological causes had only a very limited role in clinical thinking at that time, Pasamanick and Knobloch (1966), in relation to their concept of a continuum of reproductive casualty, postulated the importance of prenatal and perinatal risk factors. Studies of children with epilepsy as, for example, by Pond (1961) and by Ounsted (1955) were also influential in pointing to the interplay between biological and psychosocial risk factors. The concept of so-called “minimal brain dysfunction” was beginning to be established. It did not stand the test of empirical investigation (Rutter, 1982b) but, nevertheless, it did force people to pay attention to biological risk factors. In the realm of treatment, the value of stimulants in the treatment of children with hyperkinetic disorders was beginning to be appreciated and, in adult psychiatry, neuroleptics were starting to be developed for the treatment of schizophrenia. At about the same time, there was the birth of behavioral therapies (Wolpe, 1958). At first, these were largely considered in relation to adults, rather than children, but the application to children soon followed (Rachman, 1962; Yule & Berger, 1972).

Academic child and adolescent psychiatry scarcely existed in the 1950s although there were some chairs in the subject in North America and mainland Europe and there were the beginnings of systematic clinical research (Hersov, 1986; Remschmidt & van Engeland, 1999; Schowalter, 2000).

However, the report that probably did most to change the field in a radical fashion was Bowlby's (1951) review of “maternal deprivation” for the World Health Organization. Spitz and Goldfarb had previously drawn attention to the damaging effects of institutional care but Bowlby drew on a much wider range of evidence and did most to pull together the ideas. For quite a while, his views were treated with extreme hostility by both academic psychologists and by psychoanalysts. The former pointed to the weakness of much of the research and the latter to the heresy that the causal factors lay in real-life experiences rather than internal conflict. Despite the controversies, Bowlby's observations on young children's responses to separation from their parents led to enduring changes in hospital practice. Professionals, almost for the first time, were forced to become aware of young

children's sensitivities and of the importance of personal social relationships. The pioneering films by Robertson and Robertson (1971) were particularly influential in persuading people of the reality of many of the features that Bowlby was emphasizing.

Developments in Empirical Research Over the Last 50 Years

The fruits of empirical research over the last 50 years are considered in more detail in chapters throughout this book. Here, however, we seek to highlight some of the key developments in research strategies and research concepts, as well as giving credit to some of the pioneers who played a crucial part in taking the field forward (see also Clarke & Clarke, 1986; Hersov, 1986).

Longitudinal Studies

The value of long-term follow-up studies was most clearly established in Robins' now classic study of deviant children grown up (1966). Her findings demonstrated the important links between conduct disorders in childhood and antisocial personality disorders in adult life; they also showed for the first time how psychopathology in childhood was associated with a much increased risk of adverse environments in adulthood. The several Californian longitudinal studies were important in showing the value of prospective longitudinal studies (Elder, 1974, 1998) and the first British national birth cohort study, established by James Douglas in 1946, blazed the trail for long-term longitudinal epidemiological studies (Douglas, 1964). In more recent times, the Dunedin (Moffitt, Caspi, Rutter *et al.*, 2001) and Christchurch (Ferguson & Horwood, 2001) longitudinal studies have been particularly influential in showing the value of an hypothesis-testing approach and in demonstrating the importance of having multiple sources of measurement. Cohen's "Children in the community" longitudinal study, too, was very informative on psychopathological progressions over time (Cohen & Brook, 1987; Cohen & Cohen, 1996). Accordingly, as a consequence, there is now a substantial body of knowledge on the continuities and discontinuities between psychopathology in childhood and adult life (Rutter, Kim-Cohen & Maughan, 2006; see chapter 13, this volume). The follow-up study of the Glueck's sample of delinquent boys, undertaken by Laub and Sampson (2003) requires specific mention both because of the quite extraordinary duration of the follow-up (to age 70) and also because of its creative and rigorous combination of quantitative and qualitative approaches in order to gain an understanding, not only of risk and protective factors in relation to antisocial behavior, but also of the mechanisms through which they might operate. One key development was the recognition of the value of archival longitudinal data because of what could be gained from secondary analyses by researchers bringing new perspectives to the topic. Elder (1974, 1998) was a pioneer in that connection.

Epidemiology

With respect to epidemiology, the Isle of Wight studies (Rutter, 1989b; Rutter, Graham & Yule, 1970; Rutter, Tizard & Whitmore, 1970) showed how this could be useful for both the testing of causal hypotheses and for the planning of services. It was innovative in using systematic standardized interview techniques of tested reliability, in showing the value of using children as informants with respect to their own psychopathology, in demonstrating the frequency of mixed patterns of symptomatology (now more usually considered under the concept of comorbidity), in indicating the relatively strong associations between psychopathology and reading difficulties, in noting the differences between psychopathology beginning in childhood and that beginning in adolescence, and in observing the relatively low level of agreement among reports from different informants even when each had been shown to be reliable.

The Waltham Forest longitudinal epidemiological study was similarly important in noting that, contrary to the given wisdom of the day (and some opinions even now), psychopathological problems in the preschool period were often precursors of later psychiatric disorder (Richman, Stevenson & Graham, 1982). The clinical follow-up study undertaken later by Campbell (1994) gave the same message. More recently, a large-scale study of the prevalence of mental health problems in the UK has provided national benchmark estimates of the level of service needs in the population (Meltzer, Gatward, Goodman *et al.*, 2000). All of the epidemiological studies noted the high proportion of individuals with manifest disorders who were not receiving treatment.

Measurement

Several developments warrant mention in the domain of measurement. To begin with, there was widespread appreciation that it was essential in interviewing to use systematic standardized approaches (see chapter 19). Two rather different ways of providing standardization have been employed. In North America, this was achieved through the use of a uniform set of structured questions giving rise to "yes" or "no" answers with respect to particular well-defined elements of psychopathology. The Diagnostic Interview Schedule for Children (DISC) and Diagnostic Interview for Children and Adolescents (DICA) represent methods of this kind (Reich, 2000; Shaffer, Fisher & Lucas, 1999; Shaffer, Fisher, Lucas *et al.*, 2000). In the UK there tended to be a preference for investigator-based methods in which standardization is achieved by explicit specification of the psychopathological concepts and of the rules for their coding. This approach also differs in that the objective is the attaining of detailed descriptions of actual real-life behavior, rather than affirmative or negative answers to closed questions. Child and Adolescent Psychiatric Assessment (CAPA) provides the prototype for this approach in the field of general psychopathology (Angold, Prendergast, Cox *et al.*, 1995) and the Autism Diagnostic Interview-Revised (ADI-R) does so in the field of symptomatology associated with autism (Rutter, Le Couteur & Lord, 2003). The 1950s had

seen the demonstration of the limitations of retrospective recall (Radke-Yarrow, Campbell & Burton, 1970) and this led to a preference for longitudinal data when they were possible. On the other hand, there was a recognition that, even with longitudinal data, there had to be a degree of retrospective recall. More recent reviews have shown both the value and the limitations of retrospective and prospective data (Hardt & Rutter, 2004). From a methodological point of view, Caspi, Moffitt, Thornton *et al.*'s (1996b) development of the life history calendar approach constituted an important step forward.

Somewhat similar developments took place in the design of questionnaires. On the whole, the UK preference has been for shorter scales and the US preference for longer ones. However, it has been shown that the agreement between the two tends to be quite high (Goodman & Scott, 1999) and with all scales there has been an appreciation of the importance of having measures that have parallel versions for parents, teachers and the children themselves. Key players in these developments include Achenbach and Edelbrock (1981) in the USA, and Rutter (1967) and Goodman, Ford, Simmons *et al.*, (2003) in the UK. Another development, however, was the appreciation of the need for questionnaires that focused on specific features, as well as those that focused on general psychopathology. These are considered in more detail in chapter 20.

In parallel with the interviews to assess psychopathology, there was development of interviews to assess aspects of family functioning. Brown and Rutter (1966) and Rutter and Brown (1966) showed that reliable ratings were possible on quite subtle features such as warmth and hostility and that attention needed to be paid to tone of voice as well as the words used. This led to the development of measures of marital quality (Quinton, Rutter & Rowlands, 1976) and of negative expressed emotion (Brown & Rutter, 1966; Rutter & Brown, 1966). At first, the latter was based on lengthy interviews but briefer versions of reasonable reliability and validity were later developed (Magaña, Goldstein, Karno *et al.*, 1986; Sandberg, Rutter, Giles *et al.*, 1993).

In the field of observational studies, probably the most important development was the recognition of the value of using standardized situations as a way of providing a "press" for eliciting a particular behavior. Mary Ainsworth's development of the "Strange Situation" measurement of attachment security/insecurity (Ainsworth, Blehar, Waters *et al.*, 1978) and the Autism Diagnostic Observation Schedule (Lord, Rutter, DiLavore *et al.*, 2001) for assessing autistic features constitute particularly good examples of this approach.

Binet had pioneered the measurement of intellectual level early in the 20th century. However, the field was taken forward in a major way by the scales developed by Wechsler for the measurement of intelligence in adults and in children (Wechsler, 1986, 1992). New standards were set and, through the establishment of separate verbal and visuospatial factors, the means were provided for the quantification of more specific cognitive skills and for the study of particular patterns of cognitive strengths and limitations (see chapter 21). Similarly, Neale (1958) pioneered measures of reading that differentiated

between accuracy and comprehension, and Reynell (1969) did much the same with respect to her differentiation of language expression and comprehension. Basic research on memory functions was undertaken by Baddeley (1990) and by Tulving (1983) and there was the burgeoning development of a range of specialized tests of various neuropsychological functions – many at first to be used with adults and later extended to children (CANTAB, 1987; Connors, 1992; Reitan & Wolfson, 1993; Robbins, James, Owen *et al.*, 1998).

Diagnosis and Classification

In the 1950s, knowledge on diagnosis and classification in the whole of psychiatry was extremely limited. Robins and the Washington University group (Feighner, Robins, Guze *et al.*, 1972; Robins & Guze, 1970) pioneered the revolution in thinking on the topic – arguing forcefully for the importance of diagnostic distinctions, providing standardized measures of psychopathology and demonstrating how the validity of diagnostic distinctions could be put to the test. The original work concerned adult disorders but the application to mental disorders in childhood soon followed (Cantwell, 1988; Rutter, 1965). The end product was the highly systematized classifications of DSM-IV (American Psychiatric Association, 2000) and ICD-10 (World Health Organization, 1996). There can be no doubt that these constituted hugely important advances, but they carried with them the disadvantage of implying that the diagnostic differentiations were much more valid than the evidence justified. A better balance has now been achieved between an appreciation of the value of rules and operationalization of concepts on the one hand, and, on the other, a recognition that the existing schemes are no more than a best guess that will have to be modified as new research findings become available. The issues are more fully discussed in chapters 2 and 4.

Clinical Delineation of Hitherto Unrecognized Disorders

It is important to appreciate too that clinical observations have had a crucial role in the identification of diagnostic patterns. The best example of this is provided by Kanner's (1943) delineation of the syndrome of autism, with a scrupulously careful and astute detailed account of the clinical features shown by 11 children – almost all of which have been validated by subsequent systematic research. However, there are many other examples (see chapter 4). The key point is that clinical discoveries are still being made and that each of these original observations necessarily led to a two-way interplay between research and clinical practice (Rutter, 1998).

Psychosocial Influences

Several different types of advances have been important in providing an understanding of how family influences may affect psychopathology. Brown, working with adults, introduced the crucial methodological and conceptual checks needed to test for the causal impact of negative life events (Brown & Harris, 1989). Hetherington's (1989, 2005) longitudinal studies of the effects of divorce and remarriage showed the value of multimodal

methods of measurement and highlighted some of the key mediating mechanisms and sources of individual differences. Harlow and Harlow's (1965) experiments with rhesus monkeys, although somewhat controversial by contemporary ethical standards (Blum, 2003), were crucially important in showing that the influences involved intimate relationships ("love" in Harlow & Harlow's language) and not just "stimulation" or feeding. Hinde's studies with the same species were equally important in a different way, through the elegance of his experimental control and his demonstration of the effects of mother–infant separation in much more ordinary naturalistic circumstances (Hinde & McGinnis, 1977). Patterson (1981) was equally pioneering in his combination of quantitative observational studies and studies of intervention with humans. The result of these various developments has been an appreciation of the reality of family influences, together with an acceptance that the magnitude of effects has been exaggerated in the past (Rutter, 2005a).

In parallel with studies of the family, a range of studies has also demonstrated the importance of school influences (Rutter, Maughan, Mortimore *et al.*, 1979; Rutter & Maughan, 2002), of peer group influences (Dodge, Dishion & Lansford, 2006) and of community effects (Sampson, Raudenbush & Earls, 1997). The old style exclusive focus on parenting has given way to a realization of the much broader operation of psychosocial influences outside, as well as inside, the family. Bronfenbrenner (1979) was especially influential in pointing to the interplay between these various social systems. More recently, there has been demonstration of the impact of prenatal, as well as postnatal stress effects (McEwan & Lasley, 2002), of prenatal effects of physical toxins (Rutter, 2005b) and of the effects in adolescence of heavy cannabis use (Arseneault, Cannon, Witton *et al.*, 2004). The sometimes long-term sequelae of physical and sexual child abuse have become better recognized (see chapters 28 and 29) and it has come to be appreciated that multiple indirect causal pathways may be involved (Rutter, 1989a), as well as more direct effects on brain functioning (Rutter, 2006b).

Testing Causal Hypotheses

Over the course of the 20th century, there accumulated a substantial literature on environmental risk and protective factors for mental disorders and, at first, it was assumed that the statistical association represented environmental risk mediation. Two key papers provided a major challenge to those associations. First, Bell (1968) noted that the associations could reflect children's influences on family interactions and functioning, as well as socialization effects deriving from children's upbringing in the family. This seminal paper had been preceded by Thomas, Chess, Birch *et al.*'s (1963) demonstration of the importance of children's temperamental features (at that time termed "primary reaction patterns"). Second, Plomin brought together an impressive body of evidence showing that some of the effects of environmental risk factors were actually genetically mediated (Plomin & Bergeman, 1991). At first, many psychosocial researchers were reluctant to accept the

validity of both challenges but eventually the message was accepted and greater reliance came to be placed on the range of epidemiological and/or longitudinal designs that could deal with the possibilities of child effects and of genetic mediation (Campbell & Stanley, 1963; Rutter, 1981; Rutter, Pickles, Murray *et al.*, 2001; Rutter, 2007; Shadish, Cook & Campbell, 2002; see chapter 5). The result was a convincing demonstration of the reality of environmental risk and protective effects, combined with a realization that many of the effects were quantitatively quite small (a recognition that paralleled the comparable conclusion on the effects of individual genes – see below).

Animal Experiments

Up until very recently, child psychologists and psychiatrists have paid rather little attention to animal studies. Bowlby (1969) deserves high credit for his integration of human and animal studies in his consideration of the development of selective social attachments. Mention has already been made of the parenting studies of Harlow and Hinde. Suomi (2005) has carried the monkey studies forward in important ways through his investigation of the operation of gene–environment interactions, and Meaney (2001), through rodent studies, has revolutionized thinking on the ways in which early nurturing experiences may change gene expression – and hence alter genetic effects (Rutter, 2006a). Gross and Hen's (2004) mouse studies of the serotonergic system were important in showing how early postnatal developmental processes have a key role in later anxiety-like behavior. Amaral and Corbett's (2003) ablation studies of the amygdala in monkeys has cast new light on the role of this part of the brain in social stress reactions, and Insel and Young's (2001) studies of voles have provided vital clues on possible genetic influences on social relationships. As indicated by the important studies of Rett syndrome, animal models have also been shown to be crucially important in testing hypotheses on gene actions (Guy, Hendrich, Holmes *et al.*, 2001; Zoghbi, 2003). In addition, animal experiments have demonstrated the effects of experiences on brain structure and function (Greenough, Black & Wallace, 1987; Rosenzweig, Krech, Bennett *et al.*, 1962).

Factors Within the Child

Temperament

The last 50 years have also seen the emergence of a strong interest in temperamental features as influences on psychological development and psychopathology. Three main approaches may be identified. First, Thomas, Chess, Birch *et al.* (1963) and Thomas, Chess & Birch (1968) used an inductive approach to parent reports to develop nine individual categories concerned with adaptation to the environment, and also composite constructs of "easy" and "difficult" child features. Second, Buss and Plomin (1984) used a more psychometric approach to pick out temperamental features that were both manifest early in life and also subject to strong genetic influences. Kagan and Snidman (2004) pioneered the combination of observational and physiological measures and argued that although temperamental

features could be dimensionally measured, they might operate more as categories at the extremes of the distribution. Caspi, Moffitt, Newman *et al.*, (1996a) have also been especially influential through their demonstration of the long-term continuities from as early as age 3 years. Stevenson and Graham (1982) have queried whether the differentiation between temperament and psychopathology is valid, and Rutter (1987a) has highlighted the need to study the interconnections between temperament, broader concepts of personality and constructs of personality disorder.

Cognitive Features

In the 1960s, the ingenious and creative experimental studies of Hermelin and O'Connor (1970) were pioneering in showing that experimental methods could be applied even to young, handicapped, non-verbal children with autism, and in pointing to the likelihood that cognitive deficits would underlie the social impairments that were characteristic of autism. Their research paved the way to the more recent studies of "theory of mind" deficits, lack of central coherence and impairments in executive planning (Baron-Cohen, 1997; Frith, U., 2003; Happé, 1994). Somewhat similar attempts were made to identify specific cognitive deficits thought to underlie attention deficit/hyperactivity disorders (ADHD) (see chapter 34) and schizophrenia (see chapter 45). The results of research have proved somewhat more difficult to interpret in these two fields, but there is no doubt that the study of cognitive deficits is proving to be a most fruitful line of research (Pennington, 2002). The early studies did not address the neural basis of the deficits but that has changed with the availability of functional brain imaging and the recognition that cognitive neuroscience needs to integrate brain and mind (see below).

In parallel but separate from the study of cognitive deficits, there has been investigation of the possible role of cognitive biases in the origins of antisocial behavior (Dodge, Bates & Pettit, 1990; Dodge, Pettit, Bates *et al.*, 1995), of depression (Beck, Rush, Shaw *et al.*, 1979; Teasdale & Barnard, 1993) and in the development of internal working models of attachment relationships (Bretherton, 2005; Main, Hesse & Kaplan, 2005). There is now ample evidence of the existence of biased processing, and there is recognition of the likely psychopathological importance of such biases (Rutter, 1987b), but there continues to be a remarkable paucity of studies that have put causal hypotheses regarding the possible etiological role of cognitive biases to the test. That constitutes a major unmet research challenge for the future.

Brain Imaging

Major technological advances have made it possible to undertake quantified structural and functional brain imaging studies – particularly using magnetic resonance imaging (MRI) methods (see chapter 11). Claims have sometimes been made that the functional studies show the brain in action, but this conveys a somewhat misleading impression in that they do not identify the specific neural mechanisms. What they do do, however, is show the parts of the brain involved in particular

mental tasks, or influenced by particular chemical substances. Provided that the studies are undertaken with the necessary experimental controls and the necessary between-task and between-group contrasts, they are invaluable in showing differences between psychopathological groups in the ways in which tasks are dealt with (see chapter 11). Thus, the functional imaging studies of individuals with autism have been informative in showing not just weak activation of the brain areas ordinarily involved in "mind reading" (which is poor in autism), but normal functioning in areas dealing with earlier aspects of sensory processing (Frith, C., 2003). The implication is that the deficit in autism probably lies in an impairment in neural connectivity rather than a deficit in any one localized brain area. Studies comparing the activation of brain systems associated with pharmacological and psychological interventions (Goldapple, Segal, Garson *et al.*, 2004) have been informative in noting both similarities and differences in the mediation of therapeutic effects. The combination of molecular genetic and functional imaging strategies has been particularly informative in understanding inter-individual differences in human memory performance and memory-related brain activations (de Quervain & Papassotiropoulos, 2006) and in demonstrating that the moderation of responses to stress and adversity brought about by a genetic variant of the serotonin transporter promoter operates in normal individuals and not just those with clinical depression (Hariri, Drabant, Munoz *et al.*, 2005). Also, developmental studies using imaging methods are beginning to cast valuable light on the development of the brain (Gogtay, Giedd, Lusk *et al.*, 2004; Shaw, Greenstein, Lerch *et al.*, 2006) and of the changes in the brain following the onset of an overt schizophrenic psychosis (Rapoport, Addington, Frangou *et al.*, 2005).

EEG Methods

During the 1970s and 1980s, optimistic claims were made regarding the potential of neurometrics – meaning the quantified application of electroencephalographic (EEG) methods (Prichep, 1983). The optimism has not been borne out by subsequent research, but functional imaging using magnetoencephalography (MEG) is providing the means to study the temporal processing of tasks, which complements the spatial processing studies by MRI. Its use is too recent to assess its potential but it appears more promising than neurometrics. In addition, evoked potentials and a range of other EEG techniques have proved their usefulness (see chapter 17).

Neurochemistry

Neurochemistry, too, suffered from premature claims – as exemplified, for example, by the so-called "pink spot" supposed to be characteristic of schizophrenia. The problem was that most of the research constituted little more than a gigantic fishing expedition based on the most rudimentary understanding of neurochemistry. During the last 50 years, however, there has been a dramatic growth in the understanding of neurotransmitters and their functions (Andreasen, 2001) and there is now the potential for a much more

focused hypothesis-testing approach which is likely to pay rich dividends (see chapter 16).

Genetics

Finally, there has been the tremendous growth in the recognition of the importance of genetic influences on psychopathology, and in the understanding of how they operate (see chapter 23). At first, there was considerable resistance to suggestions that genetic factors might be important but, over the years, the weight of evidence from twin and adoptee studies of high quality made it impossible not to recognize that there were important genetic influences on all forms of human (and animal) behavior (Plomin, DeFries, McClearn *et al.*, 2001; Rutter, 2006a). Perhaps inevitably, this was accompanied by an unfortunate genetic evangelism seeking to dismiss the role of environmental influences, and to imply a much more deterministic role of genetics than is in fact the case. Nevertheless, the reality is that there is the imprint of genetic influences on almost all aspects of psychological functioning. The difference from the evangelism concerns the appreciation that many genetic influences are indirect, operating through gene–environment correlations and interactions. Hence, rather than separating disorders into those due to nature and those due to nurture, most disorders reflect a complex multifaceted co-action between the two (Rutter, 2006a; Rutter, Moffitt & Caspi, 2006). The potential of genetics has increased enormously through the possibility of identifying individual susceptibility genes (numerous pioneers were crucial in that connection; Rutter, 2006a), and through the appreciation of the value of studying gene–environment correlation and interactions (Eaves, Last, Martin *et al.*, 1977; Plomin, DeFries & Loehlin, 1977; Rutter & Silberg, 2002). Empirical advances have come especially from the human epidemiological studies of Caspi, McClay, Moffitt *et al.* (2002), Caspi, Sugden, Moffitt *et al.* (2003) and Caspi, Moffitt, Cannon *et al.* (2005), the imaging studies of Weinberger and colleagues (Hariri & Weinberger, 2003; Hariri, Drabant & Weinberger, 2006) and the animal studies of Suomi (2005).

Randomized Controlled Trials

Preceding the work on “natural experiments” to test causal hypotheses was the recognition that, if the effects of planned interventions were to be tested in rigorous fashion, randomized controlled trials were essential, and the means to conduct them in a systematic fashion had to be developed. The key point underlying this recognition was the appreciation that it was likely that the individuals volunteering to receive some new treatment were likely to differ systematically from those who declined the treatment. The solution had to lie in random assignment to the new treatment and to the old treatment with which it was to be compared (Everitt & Pickles, 1999). In medicine as a whole, in the UK Hill (1965) was a pioneer in showing what was needed, and Cochrane (see Starr & Chalmers, 2003), also in the UK, was instrumental in pointing out the dangers of reliance only on published studies, because of the bias against publishing negative findings. Cochrane-style reviews of evaluations have come to be accepted as the

standard. The USA has led the field in its recognition of the need for multicenter collaboration in order to test the effects of treatment and in its willingness to provide the funds to do this, such as the MTA trial on ADHD (see chapter 34) and the trial of antidepressants (see chapter 37). Harrington and others in the UK have also played a crucial part in undertaking randomized controlled trials and in emphasizing their importance (Harrington, Whittaker, Shoebridge *et al.*, 1998a; Harrington, Kerfoot, Dyer *et al.*, 1998b; Harrington, Whittaker & Shoebridge, 1998c). In the USA, Rapoport deserves particular credit, not just for the methodological rigor of her studies, but, more particularly, for her recognition of the need to test whether beneficial effects of medication were diagnosis-specific (Rapoport, 1980; Rapoport, Buchsbaum, Zahn *et al.*, 1978). Earlier on, Eisenberg warrants special mention for a study that showed the negative effects of withdrawal or refusal of treatment, as distinct from treatment not being available as part of a randomized controlled trial (Molling, Lockner, Sauls *et al.*, 1962). Almost all the early drugs used in psychiatry were discovered serendipitously, with little input from biological studies (Ayd & Blackwell, 1970). The field is now quite different as a result of the burgeoning of knowledge on neurotransmitters (see chapter 16).

More recently, Weisz highlighted the major differences between treatments delivered by experts in a research setting and what are supposed to be the same treatments administered on a community-wide basis by generalists rather than specialists – the results of the latter being much weaker in almost all cases (Weisz, Weersing & Henggeler, 2005). Weisz also has been influential in pointing out that only a tiny proportion of studies have included any kind of measurement of the factors mediating benefits (Weersing & Weisz, 2002a,b).

Treatment Advances

Both psychological and drug treatments have changed out of all recognition over the last 50 years. In the mid 20th century neither had much to offer, whereas now there is a substantial range of interventions bringing proven benefits. Initially, psychological methods were mainly based on a psychoanalytic approach focused almost exclusively on mental conflict and mental mechanisms rather than on real-life experiences; with a focus on the past rather than the present; and with an avoidance of any consideration of problem-solving strategies. Alternatively, they involved a rather general “supportive” function without specific focus or goals. Behavioral methods then came on the scene with their rather mechanistic application of learning principles to bring about specific changes in symptomatic behavior. They provided a huge challenge as a result of the limited evidence that they could be effective in the short term, and the much shorter duration and greater focus of the methods. In addition, they brought the claim of being based on a scientific foundation and the potential for identifying the mechanisms underlying treatment efficacy.

For some while, the psychodynamic and behaviorist camps

seemed to be in open conflict with one another. Six developments played a key part in changing that situation. First, systematic studies – such as that undertaken by Reid and Shyne (1969) – showed that, on the whole, time-limited focused psychotherapeutic methods were more effective than open-ended unfocused ones. Second, Malan (1979) argued for the value of, and pioneered the use of, briefer psychotherapeutic techniques (with adults, but the point also applies to childhood). Third, both family therapy (see chapter 65) and attachment-based concepts (Holmes, 2001) forced greater attention to the here and now of social interactions and of problematic behavior. Fourth, psychologists began to develop interventions based on problem-solving approaches of various kinds. Fifth, psychologists and psychiatrists came to recognize the important role of cognitive processes and to develop cognitive methods of behavioral treatment (see chapter 63). Sixth, behaviorists similarly came to recognize the need to take into account both thought processes, and past, as well as present, experiences. Important differences remain among psychological treatments but, to a far greater extent than previously, they have become more evidence-based and wider ranging in their methods. Amongst other things, this has meant that many interventions now include work in schools and in the community as well as work in the clinic, whether individual or family oriented.

Pharmacological treatments have undergone equally great changes. Fifty years ago dextroamphetamine was the only drug used with children (to treat hyperkinesis) and, with adults, chlorpromazine and reserpine were just about the only neuroleptics available. Neither antidepressants nor anxiolytics had come on the scene. Strikingly, then and to a considerable extent even recently, nearly all of the major classes of useful therapeutic drugs were discovered by chance rather than through basic biological research (Ayd & Blackwell, 1970). Of course, basic research into neurotransmitters has revolutionized our understanding of how drugs might work (see chapter 16) and clearly there is the potential for a much more rational development of new classes of drugs, but for the most part that has yet to happen. Later chapters review the evidence on what can be achieved by pharmacological treatments; here we simply draw attention to a few major themes.

In many respects, the most important change in therapeutic practice lies less in the details of individual methods than in the acceptance that practice needs to be evidence-based. This has led to the development of specific treatment guidelines such as those produced by the National Institute for Health and Clinical Excellence (NICE) in the UK (e.g., 2005), and in the USA by the Food and Drug Administration (FDA) (e.g., 2004), the American Academy of Pediatrics (e.g., 2001) and the American Academy of Child and Adolescent Psychiatry (e.g., Dulcan, 1997). Meta-analyses have been informative, not only in the assessment of efficacy, but also in the identification of risks, as with suicidality and antidepressant drugs (Hammad, Laughren & Racoosin, 2006).

Apart from the vast body of research on the use of stimulants to treat ADHD, most of the research with children has involved extrapolations from studies of adults. That has meant

that, until very recently, drug companies have not bothered to test their products with children and very little is known on the extent to which benefits and side-effects are the same for children as for adults. The findings with antidepressants, although far from conclusive, suggest there may be important differences – as do the findings with regard to stimulants and cannabis. The effects of age differences, and the mechanisms they reflect, constitute a still largely neglected (but crucially important) research area. As a consequence of this neglect, most drugs used to treat children have not been specifically approved for use in this age group. Fortunately, the situation is being remedied in many countries and there is now at last an official pediatric formulary in the UK (*British National Formulary for Children*, Costello, 2005). The USA passed legislation in the late 1990s requiring manufacturers to assess the efficacy and safety of drugs likely to be used with children, and this led to increased drug company research on psychotropic drugs applicable to children (Wolraich, 2003).

As in adults, most psychiatric disorders in children are recurrent or chronic. Yet we know relatively little about the effects of drug treatments on long-term outcome. Also, there are sizeable groups of child disorders for which there is no very satisfactory drug treatment. That applies, for example, to autism spectrum disorders, conduct disorders, most anxiety disorders and substance abuse. Of course, there are drugs that bring about limited symptom relief in these disorders but their effects on the basic condition are unimpressive. It is notable that there are considerable international variations in the extent to which drugs are used to treat childhood psychopathology. Thus, their use in the USA is much greater than in the UK (Bramble, 2003; Wolraich, 2003).

As a result of these considerations, although we are very positive about the future of pharmacotherapy, our optimism is guarded and is accompanied by the view that if real progress is to be achieved, there will need to be much more fundamental research into drug actions in children, as well as into the neural underpinning of disorders, and also more experimental studies examining the complex (and sometimes seemingly contradictory) connections between the nature and timing of the neurochemical effects and the behavioral responses (Bundgaard, Larsen, Jorgensen *et al.*, 2006).

Perhaps an even greater need, with respect to both psychological and pharmacological treatments, concerns the development of an understanding of the mechanisms underlying the large individual differences in treatment response. Pharmacogenomics should help but its achievements so far have been quite modest.

Theories

In many respects, one of the biggest changes during the last 50 years has been the demise of the “big” theories purporting to explain the whole of life and seeking to provide support through the provision of a religious certainty. That was the style of psychoanalysis when one of us (M.R.) first entered psychiatry and it was followed by the somewhat similar style

of other “universalist” theories such as family systems theories, Eriksonian lifespan theory, behaviorism and, most recently, attachment theory. Each of these has been important in bringing important insights and in highlighting important issues and findings. Current thinking has been the better for what they have contributed. Nevertheless, their faults have been profound and have rightly led to their being classified as history and not contemporary science or even a contemporary guide to clinical practice. That is because they tended to be “sold” as the explanation of all psychopathology (that which explains all probably explains nothing); because they conveyed an impression of certainty, whereas both science and clinical practice have to take on board the extent of uncertainty; because implicitly, and sometimes explicitly, they (like world religions) denied the validity of other views; and because they both lacked a sound empirical basis and failed to recognize the need for empirical data to resolve troubling questions and dilemmas.

The rejection of the “big” theories has definitely not meant a denial of the importance of theory and, even less, should it imply a reversion to “dustbowl empiricism.” On the contrary, there has been an increasing strength of theory and of hypothesis testing, as exemplified throughout the chapters of this book. The difference is that these are mini-theories designed to test competing alternative hypotheses about what a particular set of empirical findings might mean – in short, a postulate about what might constitute the basic mediating mechanisms or processes. As the Nobel prize winning biologist Medawar (1982) argued, science involves in equal degrees the telling of “stories” about what might be happening and the conducting of experiments to determine which aspects of the “story” are supported and which are not. The findings in turn should lead to a further story and further testing in iterative fashion.

Some people might argue that we have “big” theories today – quoting, perhaps, genetics or neurotransmitters or developmental psychopathology as examples. In our view, none of these has the same qualities as the rejected “big” theories. Thus, genetics provides an understanding of a range of mediating and moderating mechanisms that have a major role in psychopathological development, but new mechanisms that did not derive out of genetic theory continue to be discussed, and it makes no claim to account for everything. Similarly, neurotransmitters are centrally implicated in most neural processes but the understanding of their functioning does not amount to a single theory. The situation with respect to developmental psychopathology is similar. It provides an invaluable research and conceptual perspective but it incorporates a range of mechanisms, and not just one integrative model. Moreover, its strength lies in the questions it poses and the strategies it provides for tackling research questions, and not in any one overarching model.

Developmental Psychopathology

Nevertheless, developmental psychopathology has provided an invaluable research and conceptual perspective that has proved

to be as relevant for adult as for child psychiatry (Rutter, in press). There has been an explicit focusing on continuities and discontinuities in risk processes and psychopathology across the lifespan and between normality and disorder. Amongst other things, this has led to a recognition of the importance of early neurodevelopmental impairment in schizophrenia and of early life experiences in the genesis of depression, as well as the high frequency with which adult mental disorders have their first onset in childhood (see chapter 13).

The Growth of Academic Child and Adolescent Psychology and Psychiatry

As several reviews have documented, academic child and adolescent psychiatry was already being established in both Europe and North America during the first half of the 20th century (Remschmidt, 1996; Schowalter, 2000), but it really took off after World War II when it came to be recognized as a speciality in most major countries, professional appointments began to be established (so that they now exist in most, but not all, medical schools), official training standards were established during the 1960s–1980s, and there was a tremendous increase in the number of scientific publications and in the availability of research training fellowships (Hersov, 1986). In that connection, reference must be made to the role of the *Journal of Child Psychiatry and Psychology* (JCPP) and the *Journal of the American Academy of Child and Adolescent Psychiatry*. The JCPP, although developed by a pioneering psychoanalyst, Miller, was crucial in its explicit rejection of adherence to any particular theory and in its interdisciplinary coverage. It has gone from strength to strength since its launch in 1956. The American Academy journal took much longer to achieve the same breadth of approach but now it too aspires to the same aims. Both journals have been important in seeking to emphasize research–clinical links.

It is clear that a child and adolescent psychopathology has gained greatly in academic strength over the last 50 years. Several features have probably played a part. Most especially, child psychiatry has gained enormously from the central involvement of leading psychologists in most of the key research developments. Sometimes this involved interdisciplinary collaboration but, especially in the USA, the psychopathological advances took place independently of psychiatry and outside medical schools. The research contributions of psychologists have most especially concerned autism, ADHD, antisocial behavior, depression, psychological treatments, genetics and brain imaging – to give just a few examples. Some of the pioneers have been recognized already in this chapter and the role of others pervades all chapters of this book. Also, many clinicians have received formal research training – sometimes through training fellowships and sometimes through working in research units and centers. In addition, researchers have been quick to see the need and value of basic science and of methodologies derived from basic science – such as quantitative and molecular genetics, structural and functional brain

imaging, and experimental strategies, as well as hypothesis-testing approaches in epidemiological and longitudinal research.

Academic impetus has come from the centers, formal and informal, established by research pioneers who fostered the careers of numerous younger researchers (usually spanning a range of disciplines). The child psychiatry research societies (providing both mutual support and leadership) set up during the 1980s in both the UK and Germany served a similar role. What is striking in viewing the field as a whole is the extent to which concepts and findings in child psychiatry have made an impact on general psychiatry, and vice versa. A degree of autonomy in child and adolescent psychiatry has clearly been beneficial but its close research integration with the rest of psychiatry, with psychology and, to a lesser extent, with pediatrics has been equally crucial.

Children's Understanding and Role in Decision-Making

Fifty years ago, scarcely anyone considered it either necessary or worthwhile to solicit children's views on their placement when their parents' marriage broke up, or on their medical treatment or on their participation in research. Today, it is widely accepted that it is essential and useful to determine children's views in relation to treatment (British Medical Association, 2000) and to research (Royal College of Psychiatrists' Working Party, 2001). The same applies to placements following family break-up. This massive change in view has derived in part from the growing body of evidence that even very young children can, and do, conceptualize and understand. Of course, compared with adults they are more limited in their ability to look back, look forward and anticipate long-term consequences, but their cognitive capacities clearly mean that their voices must be heard and taken into account as part of shared decision-making on all major issues, while at the same time recognizing that too much responsibility should not be placed on their shoulders.

All of this represents real progress, but both dilemmas and inequities remain. A key dilemma concerns the age of criminal responsibility, which varies incredibly widely across the world. The point is that whereas even preschool children have quite a well-developed sense of what is right and wrong, nevertheless, their overall ability to be fully responsible is less than that of most adults. Even more crucially, their actions will be influenced by their immaturity and their response to criminal court proceedings means that their needs should play a part in deciding how they should be dealt with (Commission of Families & the Well-Being of Children, 2005).

The chief inequity is that in many countries (including the UK and USA) it is illegal, as well as unacceptable, for adults to assault another adult but it is not illegal for parents to beat their children if "reasonable chastisement" can be claimed. In short, children have fewer human rights in that connection than do adults. The tide is turning in many European countries (as it did earlier with respect to corporal punishment in schools),

but societies continue to be reluctant to abandon the notion that children are their parents' property, with their parents having very wide permission to treat them in any way that they think fit. Much remains to be done.

Ethics

Across the whole of medicine there has come an appreciation of the need to pay serious attention to ethical issues in both treatment and research, and to accept that ethical review needs to be undertaken by interdisciplinary committees that are independent from the research and the researchers. This is not something specific to child psychiatry, although there is the particular need to be aware of the possible problems in adults taking decisions on behalf of children (Royal College of Psychiatrists' Working Party, 2001). There is an awareness of the realities of research fraud and plagiarism (Giles, 2005), of experts in their court reports making unsupportable claims, of researchers destroying data to avoid them being examined when an accusation of fraud has been made (White, 2005), of acceptance of grants from grant-giving bodies having unacceptable aims (such as racism), or having a long-standing record of suppressing unwanted research findings (as with tobacco funding; Glantz, Barnes, Bero *et al.*, 1995), or concealing the source of their research funding. Strong concerns have also been expressed with regard to the role of pharmaceutical companies concealing findings, exerting influence on academic institutions and ghost-writing papers under the name of academics who have not had access to the data (Healy, 2004; but see Diller, 2006 for a balanced discussion of the issues). We accept that there have been abuses but, equally, we think that some of the concerns have been somewhat unbalanced. Moreover, the involvement of drug companies in product development is essential and many companies have responded appropriately by taking steps to ensure fair practice. Unquestionably, standards have risen in a most important way. There is an emphasis on a required transparency with respect to both the conduct of research and its funding. Also, there is a general acceptance that there must be efficient research governance to ensure that ethical standards are maintained.

Equally, however, there is now a growing appreciation that it is in everyone's interest that high-quality research be undertaken if our preventive and therapeutic services are to be improved in the future. Accordingly, there is some danger that mindless bureaucratic rules will prevent, or at the very least make very difficult, some of the types of research that are most needed (Academy of Medical Sciences, 2006). In many countries, including both the USA and the UK, consumer groups have had a very positive influence in urging that top-quality research is needed and that the challenge is to ensure that it is undertaken to the highest ethical standards. In that connection, a problem-solving approach is required. Consumer groups have also had a powerful advocacy role in pointing out the shortcomings in service provision and in making initiatives to improve services. Thus, in the UK this has been

evident with respect to Young Minds (dealing with child and adolescent psychopathology generally) and both the National Autistic Society (NAS) and the Association For All Speech-Impaired Children (AFASIC) – to give but two examples of groups with more focused interests. The availability of the Internet has also meant that patients and their families are now much better able to come to clinics with both knowledge and incisive questions.

Organization of Services

The last 50 years has seen major changes in the organization and content of clinical services. It is not possible to provide a statement of universal trends because there are such great differences between countries (Remschmidt & van Engeland, 1999). Thus, for example, as Chess (1988) and Eisenberg (1986) described so vividly, in the 1950s and 1960s, American psychiatry (child and adult) was totally dominated by psychoanalysis, associated with an assumption that almost all causation was environmental, and that parents were largely to blame for the problems of their children. This was followed by a massive swing to biological models, leading Eisenberg (1986) to express concern that a “brainless” psychiatry was being replaced by a “mindless” psychiatry. Today, the use of drugs occupies a prominent place in therapeutic interventions in the USA to a degree that would have been inconceivable in the 1950s and 1960s. By contrast, despite a broadening of approaches and the development of community services, and psychodynamically oriented treatments, psychoanalysis continues to occupy a predominant position in French child psychiatry (Jeammet, 1999).

Nevertheless, despite these (and numerous other) divergencies, some important trends can be discerned that apply widely, albeit not universally. It has come to be generally accepted that there is an interplay among multiple causal influences – genetic, environmental and developmental – and that all adequate clinical services must provide a range of therapeutic interventions. Nevertheless, in most parts of the world, there is a continuing shortage of clinicians (of any discipline) who have been trained to an appropriate level in the growing list of treatments of demonstrated efficacy. Although the days are numbered for the single-therapy clinician who believes that one method serves all needs, such practitioners are still numerous.

There has also been a substantial growth in research-led specialist clinics devoted to the care of individuals with particular kinds of psychopathology and to the development of improved methods of treatment for such conditions; clinics for autism spectrum disorder, for ADHD, for conduct disturbances, for eating disorders, for obsessive-compulsive disorders and for depression all constitute examples of this kind. There can be little doubt that this constitutes a most beneficial advance, but it is important to ensure that a specific focus does not lead to neglect of a broad approach to the problems presented

by individual patients. It is necessary also to consider what should be the future of the generalist clinician. We suggest that, as with the rest of medicine, it is likely that most clinicians will (and should) develop special areas of interest and expertise. We hope, however, that this will not lead to exclusionary approaches because there will always be a need to recognize that reasons for referral do not boil down to a list of pre-decided diagnoses.

The growth of these specialist clinics has led to an awareness that, for many conditions, it may not be desirable for an arbitrary division on age grounds between child/adolescent and adult psychiatry. Thus, a young person with a serious eating disorder needs to be assessed and treated by an eating disorder specialist who spans age groups, without regard for whether they are above or below the age of 16 (or whatever bureaucratic cut-off is in operation). There are special skills involved in dealing with children, and certainly it will usually be desirable to have in-patient units that cater specifically for different levels of maturity. Nevertheless, there is a need for an integration between child and adult psychiatry because of the research evidence that the majority of major mental disorders in adult life had their onset in childhood or early adolescence (Rutter, Kim-Cohen & Maughan, 2006).

Despite this desirable blurring of age boundaries, there has also been the growth of at least one relatively new age specialization – infant psychiatry. The positive aspect of this development has been the appreciation that very young children can and do suffer from mental disorders which require skilled assessment and treatment. The less desirable feature has been the often heavy, exclusive reliance on psychoanalysis and attachment theory, and the weak links with developmental pediatrics. It is also striking that there has *not* been the development of good services for young adults who suffer from the continuation of a neurodevelopmental disorder (see chapters 13 and 3). That is something that will have to be remedied in the years ahead.

There has been an appreciation that it is desirable that many mental health problems should be dealt with at the primary care level, without referral to specialized clinics. The use of community psychiatric nurses, school counselors and primary care consultative services are all examples. There has been a paucity of adequate evaluations of their efficacy and this is much needed, but the general notion of intervening early as part of universal services seems sound. The key challenge is to ensure that those providing these early interventions are appropriately trained and supervised, with adequate access to consultative advice when needed. It is also relevant that there have been major developments in special educational services (see chapter 74).

In some countries (such as the UK), a model of a multitier service has developed, with different levels of expertise at each tier (Hill, 1999). In principle, that sounds desirable but it is less clear how well it works in practice. It was preceded by a breaking down of the divisions that had grown up between community child guidance clinics and hospital-

based psychiatric out-patient clinics. Increasingly, staff work in both settings. Once again, however, the aspiration of good integration between the two has not always resulted in the desired practice.

Two negative influences on service development need to be mentioned. First, economic goals have come to have an increasing dominance. In many places this has meant that clinicians are discouraged from participating in research because it is not a part of their clinical contract. Equally, however, clinical researchers are expected to provide clinical services that bring in funds, rather than those that make sense in relation to research and development goals. Second, in some countries (perhaps especially the UK), professional advancement for social workers and nurses has depended on their taking administrative responsibility rather than on their clinical skills as applied to the development of better methods of treatment.

Finally, we note that not all aspects of child and adolescent mental health services have developed equally strongly. In many places, forensic psychiatry, services for individuals with substance use disorders and services for those with an intellectual disability remain rather Cinderella-like subspecialties. It appears that, to a large extent, this is a consequence of a weaker integration between research and practice. There are positive developments in each of these areas but much remains to be done.

Conclusions

The last 50 years has seen an amazing revolution in child psychiatry, a revolution that parallels that in the rest of psychiatry. As a consequence, the body of knowledge, and the range of therapeutic interventions, have increased in a way that would have seemed scarcely conceivable 50 years ago. We welcome these many gains but we draw attention to four key issues. First, it is crucial to appreciate the giant strides made by the iconoclastic pioneers of half a century ago. Today, the need for researchers who will question the given wisdom of the day is just as great as it ever was. Second, the advances in basic science have opened up vital avenues of development for clinical practice, and it is essential that these are pursued in a vigorous fashion. Equally, however, we need to recognize that the pathways work in both directions. Namely, some of the creative ideas stem from clinical science as well as from basic science, and clinical science involves far more than the translation of findings from the laboratory to interventions at the bedside. Third, the supposed division between basic science and clinical science is somewhat artificial. Some of the most important science represents an amalgam of the two (Rutter, 2005c). Finally, we need to appreciate the crucial role of clinical observations. Their value has been dramatically evident in the identification of new syndromes but it is equally important in thinking about causal processes and about clinical interventions. The interplay between clinical practice and empirical research is two-way, not unidirectional.

Further Reading

- Rutter, M. (in press). Scientific foundations of clinical practice. In: R. Williams, K. W. M. Fulford, & M. Shooter (Eds.), *Psychiatry in the 21st century: Principles, possibilities and challenges*. London: Gaskell.
- Rutter, M. (in press). Developing concepts in developmental psychopathology. In: J. Hudziak (Ed.), *Genetic and environmental influences on developmental psychopathology*. Arlington, VA: American Psychiatric Publishing.

References

- Academy of Medical Sciences. (2006). *Personal data for public good: Using health information in medical research*. London: Academy of Medical Sciences.
- Achenbach, T. (1974). *Developmental psychopathology*. New York: Ronald Press.
- Achenbach, T., & Edelbrock, C. (1981). Behavioral problems and competencies reported by parents of normal and disturbed children aged 4 through 16. *Monographs of the Society for Research in Child Development*, 46, 1–82.
- Ainsworth, M., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum Associates.
- Amaral, D. G., & Corbett, B. A. (2003). The amygdala, autism and anxiety. In: Novartis Foundation Symposium 251, *Autism: Neural basis and treatment possibilities* (pp. 177–197). Chichester, UK: John Wiley & Sons Ltd.
- American Academy of Pediatrics, Subcommittee on Attention-Deficit/Hyperactivity Disorder and Committee on Quality Improvement. (2001). Clinical practice guideline: Treatment of the school-aged child with attention-deficit/hyperactivity disorder. *Pediatrics*, 108, 1033–1044.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (DSM-IV)*, 4th edn. Text Revision. Washington, DC: American Psychiatric Association.
- Andreasen, N. C. (2001). *Brave new brain*. Oxford: Oxford University Press.
- Angold, A., Prendergast, M., Cox, A., Harrington, R., Simonoff, E., & Rutter, M. (1995). The child and adolescent psychiatric assessment (CAPA). *Psychological Medicine*, 25, 739–753.
- Arseneault, L., Cannon, M., Witton, J., & Murray, R. M. (2004). Causal association between cannabis and psychosis: examination of the evidence. *British Journal of Psychiatry*, 184, 110–117.
- Ayd, F. J., & Blackwell, B. (Eds.). (1970). *Discoveries in biological psychiatry*. Philadelphia, PA: Lippincott.
- Baddeley, A. (1990). *Human memory*. London: Lawrence Erlbaum Associates.
- Baron-Cohen, S. (1997). *Mindblindness: An essay on autism and theory of mind*. Massachusetts: The MIT Press.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York: Guilford Press.
- Bell, R. Q. (1968). A reinterpretation of the direction of effects in studies of socialization. *Psychological Review*, 75, 81–95.
- Bettelheim, B. (1967). *The empty fortress: Infantile autism and the birth of the self*. London: Collier-Macmillan.
- Blum, D. (2003). *Love at Goon Park*. Chichester, UK: Wiley.
- Bowlby, J. (1951). *Maternal care and mental health*. Geneva: World Health Organization.
- Bowlby, J. (1969). *Attachment and Loss* (Vol. 1), *Attachment*. London: Hogarth Press.
- Bramble, D. (2003). Annotation: The use of psychotropic medications in children: a British view. *Journal of Child Psychology and Psychiatry*, 44, 169–179.
- Bretherton, I. (2005). In pursuit of the internal working model construct and its relevance to attachment relationships. In: K. E.

- Grossmann, K. Grossmann, & E. Waters (Eds.), *Attachment from infancy to adulthood* (pp. 13–47). London: Guilford Press.
- British Medical Association. (2000). *Consent, rights and choices in health care for children and young people*. London: BMJ Books.
- Bronfenbrenner, U. (1979). *The ecology of human development: experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Brown, G., & Harris, T. O. (1989). *Life events and illness*. New York: Guilford Press.
- Brown, G. W., & Rutter, M. (1966). The measurement of family activities and relationships: A methodological study. *Human Relations*, 19, 241–263.
- Bundgaard, C., Larsen, F., Jorgensen, M., & Gabrielson, J. (2006). Mechanistic model of acute autoinhibitory feedback action after administration of SSRIs in rats: Application to escitalopram-induced effects on brain serotonin levels. *European Journal of Pharmaceutical Sciences*, 29(5), 394–404.
- Buss, A. H., & Plomin, R. (1984). *Temperament: early developing personality traits*. Hillsdale NJ: Lawrence Erlbaum.
- Cameron, K. (1956). Past and present trends in child psychiatry. *Journal of Mental Science*, 102, 599–603.
- Campbell, S. B. (1994). Hard-to-manage preschool boys: externalizing behavior, social competence, and family context at two-year follow-up. *Journal of Abnormal Child Psychology*, 22, 147–166.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Boston, MA: Houghton Mifflin Company.
- CANTAB. (1987). *The Cambridge neuropsychological test automated battery*. Cambridge: Cambridge Cognition Ltd.
- Cantwell, D. P. (1988). DSM-III studies. In: M. Rutter, A. H. Tuma, & I. S. Lann (Eds.), *Assessment and diagnoses in child psychopathology* (pp. 3–36). New York: Guilford Press.
- Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., et al. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 297, 851–854.
- Caspi, A., Moffitt, T. E., Cannon, M., McClay, J., Murray, R., Harrington, H., et al. (2005). Moderation of the effect of adolescent-onset cannabis use on adult psychosis by a functional polymorphism in the COMT gene: Longitudinal evidence of a gene X environment interaction. *Biological Psychiatry*, 57, 1117–1127.
- Caspi, A., Moffitt, T. E., Newman, D. L., & Silva, P. A. (1996a). Behavioral observations at age 3 years predict adult psychiatric disorders: longitudinal evidence from a birth cohort. *Archives of General Psychiatry*, 53, 1033–1039.
- Caspi, A., Moffitt, T. E., Thornton, A., Freedman, D., Amell, J. W., Harrington, H. L., et al. (1996b). The Life History Calendar: A research and clinical assessment method for collecting retrospective event-history data. *International Journal of Methods in Psychiatric Research*, 6, 101–114.
- Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H. L., et al. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science*, 301, 386–389.
- Chess, S. (1988). Child and adolescent psychiatry come of age: a fifty year perspective. *Journal of American Academy of Child and Adolescent Psychiatry*, 27, 1–7.
- Clarke, A. M., & Clarke, A. D. (1986). Thirty years of child psychology: a selective review. *Journal of Child Psychology and Psychiatry*, 27, 719–759.
- Cohen, P., & Brook, J. S. (1987). Family factors related to the persistence of psychopathology in childhood and adolescence. *Psychiatry*, 50, 332–345.
- Cohen, P., & Cohen, J. (1996). *Life values and adolescent mental health*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Commission of Families & the Well-Being of Children. (2005). *Families and the state. Two-way support and responsibilities*. Bristol: Policy Press.
- Connors, C. K. (1992). *Manual for the Connor's continuous performance task*. Toronto: Multi Health Systems.
- Costello, I. (Ed.). (2005). *British National Formulary for Children*. London: BMJ Publications.
- de Quervain, D. J.-F., & Papassotiropoulos, A. (2006). Identification of a genetic cluster influencing memory performance and hippocampal activity in humans. *Proceedings of the National Academy of Sciences*, 103, 4270–4274.
- Diller, L. H. (2006). *The last normal child: Essays on the intersection of kids, culture and psychiatric drugs*. Westport, CT: Praeger.
- Dodge, K. A., Bates, J. E., & Pettit, G. S. (1990). Mechanisms in the cycle of violence. *Science*, 250, 1678–1683.
- Dodge, K. A., Pettit, G. S., Bates, J. E., & Valente, E. (1995). Social information-processing patterns partially mediate the effects of early physical abuse on later conduct problems. *Journal of Abnormal Psychology*, 104, 632–643.
- Dodge, K. A., Dishion, T. J., & Lansford, J. E. (Eds.). (2006). *Deviant peer influences in programs for youth: Problems and solutions*. New York: Guilford Press.
- Douglas, J. W. B. (1964). *The home and the school*. London: MacGibbon & Kee.
- Dulcan, M. (1997). Practice parameters for the assessment and treatment of children, adolescents and adults with attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36(Suppl), 85S–121S.
- Eaves, L. J., Last, K. S., Martin, H. G., & Jinks, J. L. (1977). A progressive approach to non-additivity and genotype-environmental covariance in the analysis of human differences. *British Journal of Mathematical and Statistical Psychology*, 30, 1–42.
- Eisenberg, L. (1986). Mindlessness and brainlessness in psychiatry. *British Journal of Psychiatry*, 148, 497–508.
- Eisenberg, L. (2001). The past 50 years of child and adolescent psychiatry: A personal memoir. *Journal of American Academy of Child and Adolescent Psychiatry*, 40, 743–748.
- Elder, G. H. (1974). *Children of the Great Depression*. Chicago: University of Chicago Press.
- Elder, G. H. (1998). The life course as developmental theory. *Child Development*, 69, 1–12.
- Everitt, B. F., & Pickles, A. (1999). *Statistical aspects of design and analysis of clinical trials*. London: Imperial College Press.
- Feighner, J. P., Robins, E., Guze, S. B., Woodruff, R. A., Winokur, G., & Muno, R. (1972). Diagnostic criteria for use in psychiatric research. *Archives of General Psychiatry*, 26, 57–63.
- Ferguson, D. M., & Horwood, L. J. (2001). The Christchurch Health and Development Study: Review of Findings on Child and Adolescent Mental Health. *Australian and New Zealand Journal of Psychiatry*, 35, 287–296.
- Food and Drug Administration. (2004). *Public Health Advisory: suicidality in children and adolescents being treated with antidepressant medications*. Retrieved from <http://www.fda.gov/cder/dru/antidepressants/SSRIHA200410.htm> Feb. 16, 2007.
- Frith, C. (2003). What do imaging studies tell us about the neural basis of autism? In: Novartis Foundation Symposium 251. *Autism: Neural basis and treatment possibilities* (pp. 149–176). Chichester, UK: John Wiley & Sons Ltd.
- Frith, U. (2003). *Autism: explaining the enigma* (2nd ed.). Oxford, UK: Blackwell Publishing.
- Giles, J. (2005). Taking on the cheats. *Nature*, 435, 258–259.
- Glantz, S. A., Barnes, D. E., Bero, L., Hanauer, P., & Slade, J. (1995). Looking through a keyhole at the tobacco industry. The Brown and Williamson documents. *Journal of the American Medical Association*, 274, 219–224.
- Gogtay, N., Giedd, J. N., Lusk, L., Hayashi, K. M., Greenstein, D., Vaituzis, A. C., et al. (2004). Dynamic mapping of human cortical development during childhood through early adulthood. *Proceedings of the National Academy of Sciences USA*, 101, 8174–8179.

- Goldapple, K., Segal, Z., Garson, C., Lau, M., Bieling, P., Kennedy, S., *et al.* (2004). Modulation of cortical–limbic pathways in major depression: Treatment-specific effects of cognitive behavior therapy. *Archives of General Psychiatry*, *61*, 34–41.
- Goodman, R., & Scott, S. (1999). Comparing the strengths and difficulties questionnaire and the child behavior checklist: is small beautiful? *Journal of Abnormal Child Psychology*, *27*, 17–24.
- Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2003). Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *International Review of Psychiatry*, *15*, 166–172.
- Greenough, W. T., Black, J. E., & Wallace, C. S. (1987). Experience and brain-development. *Child Development*, *58*, 539–559.
- Gross, C., & Hen, R. (2004). The developmental origins of anxiety. *Nature Reviews Neuroscience*, *5*, 545–552.
- Guy, J., Hendrich, B., Holmes, M., Martin, J. E., & Bird, A. (2001). A mouse MECP2-null mutation causes neurological symptoms that mimic Rett syndrome. *Nature Genetics*, *27*, 322–326.
- Hammad, H. A., Laughren, T., & Racoosin, J. (2006). Suicidality in pediatric patients treated with antidepressant drugs. *Archives of General Psychiatry*, *63*, 332–339.
- Happé, F. (1994). *Autism: an introduction to psychological theory*. London: UCK Press.
- Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: Review of the evidence. *Journal of Child Psychology and Psychiatry*, *45*, 260–273.
- Hariri, A. R., & Weinberger, D. R. (2003). Imaging genomics. *British Medical Bulletin*, *65*, 259–270.
- Hariri, A., Drabant, E., Munoz, K., Kolachana, B., Venkata, S., Egan, M., *et al.* (2005). A susceptibility gene for affective disorders and the response of the human amygdala. *Archives of General Psychiatry*, *62*, 146–152.
- Hariri, A. R., Drabant, E. M., & Weinberger, D. R. (2006). Imaging genetics: Perspectives from studies of genetically driven variation in serotonin function and corticolimbic affective processing. *Biological Psychiatry*, *59*, 888–897.
- Harlow, H. F., & Harlow, M. K. (1965). The effect of rearing conditions on behavior. *International Journal of Psychiatry*, *13*, 43–51.
- Harrington, R., Whittaker, J., Shoebridge, P., & Campbell, F. (1998a). Systematic review of efficacy of cognitive behaviour therapies in child and adolescent depressive disorder. *British Medical Journal*, *316*, 1559–1563.
- Harrington, R., Kerfoot M., Dyer, E., McNiven, F., Gill, J., Harrington, V., *et al.* (1998b). Randomized trial of a home based family intervention for children who have deliberately poisoned themselves. *Journal of the American Academy of Child and Adolescent Psychiatry*, *37*, 512–518.
- Harrington, R., Whittaker, J., & Shoebridge, P. (1998c). Psychological treatment of depression in children and adolescents: A review of treatment research. *British Journal of Psychiatry*, *173*, 291–298.
- Healy, D. (2004). *Let them eat Prozac: The unhealthy relationship between the pharmaceutical industry and depression*. New York: New York University Press.
- Hermelin, B., & O'Connor, N. (1970). *Psychological experiments with autistic children*. Oxford: Pergamon.
- Hersov, L. (1986). Child psychiatry in Britain: The last 30 years. [Review.] *Journal of Child Psychology and Psychiatry*, *27*, 781–801.
- Hetherington, E. M. (1989). Coping with family transitions: winners, losers and survivors. *Child Development*, *60*, 1–14.
- Hetherington, E. M. (2005). Divorce and the adjustment of children. *Pediatric Review*, *26*, 163–169.
- Hewitt, L. E., & Jenkins, R. L. (1946). *Fundamental patterns of maladjustment*. Springfield, IL: State of Illinois.
- Hill, A. B. (1965). The environment and disease: Association or causation? *Proceedings of the Royal Society of Medicine*, *58*, 295–300.
- Hill, P. (1999). Child and adolescent psychiatry in the United Kingdom. In: H. Remschmidt, & H. van Engeland (Eds.), *Child and adolescent psychiatry in Europe*. Steinkopff: Darmstadt; Springer: New York.
- Hinde, A., & McGinnis, L. (1977). Some factors influencing the effect of temporary mother–infant separation: Some experiments with rhesus monkeys. *Psychological Medicine*, *7*, 197–212.
- Holmes, J. (2001). *The search for the secure base: Attachment theory and psychotherapy*. London: Brunner-Routledge.
- Insel, T. R., & Young, L. J. (2001). The neurobiology of attachment. *Nature Reviews: Neuroscience*, *2*, 129–136.
- Jackson, D. D. (1960). A critique of the literature on the genetics of schizophrenia. In: D. D. Jackson (Ed.), *The Etiology of Schizophrenia* (pp. 37–87). New York: Basic Books.
- Jeammet, P. (1999). Child and adolescent psychiatry in France. In: H. Remschmidt & H. van Engeland (Eds.), *Child and adolescent psychiatry in Europe*. Steinkopff: Darmstadt; Springer: New York.
- Kagan, J., & Snidman, N. (2004). *The long shadow of temperament*. Cambridge, MA: Belknap Press of Harvard University Press.
- Kanner, L. (1943). Autistic disturbances of affective contact. *The Nervous Child*, *2*, 217–250.
- Kanner, L. (1959). The Thirty-Third Maudsley Lecture: Trends in child-psychiatry. *Journal of Mental Science*, *105*, 581–593.
- Kanner, L. (1969). Children haven't read those books, reflections on differential diagnosis. *Acta Paedopsychiatrica*, *36*, 2–11.
- Laub, J. H., & Sampson, R. J. (2003). *Shared beginnings, divergent lives: Delinquent boys to age 70*. Cambridge, MA: Harvard University Press.
- Lord, C., Rutter, M., DiLavore, P. C., & Risi, S. (2001). *Autism Diagnostic Observation Schedule*. Los Angeles, CA: Western Psychological Services.
- Magaña, A. B., Goldstein, M. J., Karno, M., & Miklowitz, D. J. (1986). A brief method for assessing expressed emotion in relatives of psychiatric patients. *Psychiatric Research*, *17*, 203–212.
- Main, M., Hesse, E., & Kaplan, N. (2005). Predictability of attachment behavior and representational processes at 1, 6 and 19 years. In: K. E. Grossmann, K. Grossmann, & E. Waters (Eds.), *Attachment from infancy to adulthood* (pp. 245–304). London: Guilford Press.
- Malan, D. (1979). *Individual psychotherapy and the science of psychodynamics*. London: Butterworths.
- McEwan, B., & Lasley, E. N. (2002). *The end of stress*. Washington, DC: Joseph Henry Press.
- Meaney, M. J. (2001). Maternal care, gene expression, and the transmission of individual differences in stress reactivity across generations. *Annual Review of Neuroscience*, *24*, 1161–1192.
- Medewar, P. (Ed.). (1982). *Pluto's Republic*. Oxford: Oxford University Press.
- Meehl, P. E. (1954). *Clinical versus statistical prediction: A theoretical analysis and a review of the evidence*. Minneapolis: University of Minnesota Press.
- Meltzer, H., Gatward, R., Goodman, R., & Ford, T. (2000). *Mental health of children and adolescents in Great Britain*. London: Stationery Office.
- Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). *Sex differences in antisocial behavior: Conduct disorder, delinquency, and violence in the Dunedin Longitudinal Study*. Cambridge, UK: Cambridge University Press.
- Molling, P., Lockner, A., Sauls, R. J., & Eisenberg, L. (1962). Committed delinquent boys: The impact of perphenazine and of placebo. *Archives of General Psychiatry*, *7*, 70–76.
- Neale, M. D. (1958). *Neale analysis of reading ability*. London: Macmillan.
- National Institute for Health and Clinical Excellence. (2005). *Depression in children and young people: identification and management in primary, community and secondary care*. Retrieved from www.nice.org.uk or <http://www.nice.org.uk/page.aspx?o=cg028> Feb. 16, 2007.

- Ounsted, C. (1955). The hyperkinetic syndrome in epileptic children. *Lancet*, *ii*, 303–311.
- Parry-Jones, W. L. (1989). The history of child and adolescent psychiatry: its present day relevance. *Journal of Child Psychology and Psychiatry*, *30*, 3–11.
- Pasamanick, B., & Knobloch, H. (1966). Retrospective studies on the epidemiology of reproductive casualty: old and new. *Merrill-Palmer Quarterly of Behavioural Development*, *12*, 7–26.
- Patterson, G. R. (1981). *Coercive family process*. Eugene, OR: Castalia Publishing.
- Pennington, B. (2002). *The development of psychopathology: Nature and nurture*. New York: Guilford Press.
- Plomin, R., & Bergeman, C. S. (1991). The nature of nurture: Genetic influence on “environmental” measures. *The Behavioural and Brain Sciences*, *14*, 373–427.
- Plomin, R., DeFries, J. C., & Loehlin, J. C. (1977). Genotype–environment interaction and correlation in the analysis of human behavior. *Psychological Bulletin*, *84*, 309–322.
- Plomin, R., DeFries, J., McClearn, G. E., & McGuffin, P. (Eds.). (2001). *Behavioral genetics* (4th ed.). New York: Worth Publishers.
- Pond, D. A. (1961). Psychiatric aspects of epileptic and brain-damaged children. *British Medical Journal*, *2*, 1378–1382.
- Prichep, L. (1983). Neurometrics: Quantitative evaluation of brain dysfunction in children. In: M. Rutter (Ed.), *Developmental Neuropsychiatry* (pp. 213–238). Edinburgh: Churchill Livingstone.
- Quinton, D., Rutter, M., & Rowlands, O. (1976). An evaluation of an interview assessment of marriage. *Psychological Medicine*, *6*, 577–586.
- Rachman, S. (1962). Learning theory and child psychology: therapeutic possibilities. *Journal of Child Psychology & Psychiatry*, *3*, 149–168.
- Radke-Yarrow, M. J. D., Campbell, J. D., & Burton, R. V. (1970). Recollections of childhood: A study of the retrospective method. *Monographs of the Society for Research in Child Development*, *35*, 1–83.
- Rapoport, J. (1980). Diagnostic significance of drug response in child psychiatry. In: L. Eisenberg (Ed.), *Psychopathology of children and youth* (pp. 154–170). New York: Josiah Macy Jr Foundation.
- Rapoport, J., Addington, A., Frangou, S., & MRC Psych. (2005). The neurodevelopmental model of schizophrenia: Update 2005. *Molecular Psychiatry*, *10*, 434–449.
- Rapoport, J., Buchsbaum, M. S., Zahn, T. P., Weingartner, H., Ludlow, C., & Mikkelsen, E. J. (1978). Dextroamphetamine: cognitive and behavioural effects in normal prepubertal boys. *Science*, *199*, 560–563.
- Reich, W. (2000). Diagnostic interview for children and adolescents (DICA). *Journal of the American Academy of Child and Adolescent Psychiatry*, *39*, 59–66.
- Reid, W. J., & Shyne, A. W. (1969). *Brief and extended casework*. New York: Columbia University Press.
- Reitan, R. M., & Wolfson, D. (1993). *The Halstead-Reitan Neuropsychology Test Battery: Theory and clinical interpretation*. Tucson, AZ: Neuropsychology Press.
- Remschmidt, H. (1996). Changing views: New perspectives in child psychiatric research. *European Child & Adolescent Psychiatry*, *5*, 2–10.
- Remschmidt, H., & van Engeland, H. (Eds.). (1999). *Child and adolescent psychiatry in Europe*. Darmstadt: Steinkopff; New York: Springer.
- Reynell, J. (1969). *Reynell developmental language scales*. Windsor, UK: NFER Publishing Company.
- Richman, N., Stevenson, J., & Graham, P. (1982). *Preschool to school: a behavioral study*. London: Academic Press.
- Robertson, J., & Robertson, J. (1971). Young children in brief separation: A fresh look. *Psychoanalytic Study of the Child*, *26*, 264–315.
- Robins, E., & Guze, S. B. (1970). Establishment of diagnostic validity in psychiatric illness: its application to schizophrenia. *American Journal of Psychiatry*, *126*, 983–987.
- Robins, L. (1966). *Deviant children grown up: A sociological and psychiatric study of sociopathic personality*. Baltimore: Williams & Wilkins.
- Robbins, T. W., James, M., Owen, A. M., Sahakian, B. J., Lawrence, A. D., McInnes, L., et al. (1998). A study of performance on tests from the CANTAB battery sensitive to frontal lobe dysfunction in a large sample of normal volunteers: implications for theories of executive functioning and cognitive aging. *Cambridge Neuropsychological Test Automated Battery. Journal of the International Neuropsychological Society*, *4*, 474–490.
- Rosenzweig, M. R., Krech, D., Bennett, E. L., & Diamond, M. C. (1962). Effects of environmental complexity and training on brain chemistry and anatomy: a replication and extension. *Journal of Comparative Physiology & Psychology*, *55*, 429–437.
- Royal College of Psychiatrists’ Working Party. (2001). *Guidelines for researchers and for research ethics committees on psychiatric research involving human participants*. (Council Report No. CR82). London: Royal College of Psychiatrists.
- Rutter, M. (1965). Classification and categorization in child psychiatry. *Journal of Child Psychology and Psychiatry*, *6*, 71–83.
- Rutter, M. (1967). A children’s behaviour questionnaire for completion by teachers: Preliminary findings. *Journal of Child Psychology & Psychiatry*, *8*, 1–11.
- Rutter, M. (1970). Autistic children: Infancy to adulthood. *Seminars in Psychiatry*, *2*, 435–450.
- Rutter, M. (1981). Epidemiological/longitudinal strategies and research in child psychiatry. *Journal of the American Academy of Child Psychiatry*, *20*, 513–544.
- Rutter, M. (1982a). Psychological therapies in child psychiatry: Issues and prospects. *Psychological Medicine*, *12*, 723–740.
- Rutter, M. (1982b). Syndromes attributed to “Minimal Brain Dysfunction” in childhood. *American Journal of Psychiatry*, *139*, 21–33.
- Rutter, M. (1987a). Temperament, personality and personality disorder. *British Journal of Psychiatry*, *150*, 443–458.
- Rutter, M. (1987b). The role of cognition in child development and disorder. *British Journal of Medical Psychology*, *60*, 1–16.
- Rutter, M. (1989a). Pathways from childhood to adult life. *Journal of Child Psychology and Psychiatry*, *30*, 23–51.
- Rutter, M. (1989b). Isle of Wight revisited: twenty-five years of child psychiatric epidemiology. *Journal of American Academy Child Adolescent Psychiatry*, *28*, 633–653.
- Rutter, M. (1998). Practitioner review: Routes from research to clinical practice in child psychiatry: Retrospect and prospect. *Journal of Child Psychology and Psychiatry*, *39*, 805–816.
- Rutter, M. (2005a). Environmentally mediated risks for psychopathology: Research strategies and findings. *Journal of American Academy of Child and Adolescent Psychiatry*, *44*, 3–18.
- Rutter, M. (2005b). Adverse preadoption experiences and psychological outcomes. In: D. M. Brodzinsky, & J. Palacios (Eds.), *Psychological issues in adoption: Theory, research and application* (pp. 67–92). Westport, CT: Greenwood Publishing.
- Rutter, M. (2005c). Autism research: Lessons from the past and prospects for the future. *Journal of Autism and Developmental Disorders*, *35*, 241–257.
- Rutter, M. (2006a). *Genes and behavior: Nature–nurture interplay explained*. Oxford: Blackwell Publishing.
- Rutter, M. (2006b). The psychological effects of early institutional rearing. In: P. J. Marshall, & N. A. Fox (Eds.), *The Development of Social Engagement* (pp. 355–392). New York: Oxford University Press.
- Rutter, M. (in press). Developing concepts in developmental psychopathology. In: J. J. Hudziak (Ed.), *Genetic and environmental*

- influences on developmental psychopathology*. Arlington, VA: American Psychiatric Publishing.
- Rutter, M. (2007). Proceeding from observed correlation to causal inference: The use of natural experiments. *Perspectives on Psychological Science*, 2, 377–395.
- Rutter, M., & Brown, G. W. (1966). The reliability and validity of measures of family life and relationships in families containing a psychiatric patient. *Social Psychiatry*, 1, 38–53.
- Rutter, M., Graham, P., & Yule, W. (1970). A neuropsychiatric study in childhood. *Clinics in Developmental Medicine* 35/36. London: Heinemann/SIMP.
- Rutter, M., Kim-Cohen, J., & Maughan, B. (2006). Continuities and discontinuities in psychopathology between childhood and adult life. *Journal of Child Psychology and Psychiatry*, 47(3/4), 276–295.
- Rutter, M., Le Couteur, A., & Lord, C. (2003). *ADI-R: Autism Diagnostic Interview – Revised*. Los Angeles, CA: Western Psychological Services.
- Rutter, M., & Maughan, B. (2002). School effectiveness findings 1979–2002. *Journal of School Psychology*, 40, 451–475.
- Rutter, M., Maughan, B., Mortimore, P., Ouston, J., & Smith, A. (1979). *Fifteen thousand hours: Secondary schools and their effects on children*. London: Open Books; Cambridge, MA: Harvard University Press. Reprinted, 1994, London: Paul Chapman Publishers.
- Rutter, M., Moffitt, T. E., & Caspi, A. (2006). Gene–environment interplay and psychopathology: multiple varieties but real effects. *Journal of Child Psychology and Psychiatry*, 47(3/4), 226–261.
- Rutter, M., Pickles, A., Murray, R., & Eaves, L. (2001). Testing hypotheses on specific environmental causal effects on behavior. *Psychological Bulletin*, 127, 291–324.
- Rutter, M., & Silberg, J. (2002). Gene–environment interplay in relation to emotional and behavioral disturbance. *Annual Review of Psychology*, 53, 463–490.
- Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, Health and Behaviour*. London: Longmans; [Reprinted 1981, Melbourne, FA: Krieger.]
- Sampson, R. J., Raudenbush, S. W., & Earls, F. W. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277, 918–924.
- Sandberg, S., Rutter, M., Giles, S., Owen, A., Champion, L., Nicholls, J., et al. (1993). Assessment of psychosocial experiences in childhood: methodological issues and some illustrative findings. *Journal of Child Psychology and Psychiatry*, 34, 879–897.
- Schwalter, J. (2000). Child & adolescent psychiatry comes of age, 1944–1994. In: R. W. Menninger & J. C. Nemiah (Eds.), *American psychiatry after World War II* (pp. 461–480). Washington, DC: American Psychiatric Press.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston & New York: Houghton Mifflin Company.
- Shaffer, D., Fisher, P. W., & Lucas, C. P. (1999). Respondent-based interviews. In: D. Shaffer, C. P. Lucas, & J. E. Richters (Eds.), *Diagnostic Assessment in Child and Adolescent Psychopathology* (pp. 3–33). New York: Guilford Press.
- Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH Diagnostic Interview Schedule for Children version IV (NIMH DISC-IV): description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39, 28–38.
- Shaw, P., Greenstein, D., Lerch, J., Clasen, L., Lenroot, R., Gogtay, N., et al. (2006). Intellectual ability and cortical development in children and adolescents. *Nature*, 30, 676–679.
- Starr, M., & Chalmers, I. (2003). *The evolution of the Cochrane Library, 1988–2003*. UPDATE software: Oxford. Retrieved from www.update-software.com/history/clibhist.htm Feb. 16, 2007.
- Stevenson, J. P., & Graham, P. (1982). Temperament: a consideration of concepts and methods. *Ciba Foundation Symposium*, 89, 36–50.
- Suomi, S. J. (2005). Aggression and social behaviour in rhesus monkeys. *Novartis Foundation Symposium*, 268, 216–222; discussion 222–226, 242–253.
- Teasdale, J. D., & Barnard, P. J. (1993). *Affect cognition and change: Re-modelling depressive thought*. Hove, UK: Lawrence Erlbaum Associates.
- Thomas, A., Chess, S., Birch, H. G., Hertzog, M. E., & Korn, S. (1963). *Behavioral individuality in early childhood*. New York: New York University Press.
- Thomas, A., Chess, S., & Birch, H. G. (1968). *Temperament and behavior disorders in children*. New York: New York University Press.
- Tulving, E. (1983). *Elements of episodic memory*. New York: Oxford University Press.
- Volkmar, F. R., & Nelson, D. S. (1990). Seizure disorders in autism. *Journal of the American Academy of Child & Adolescent Psychiatry*, 1, 127–129.
- Warren, W. (1974). *Child Psychiatry and the Maudsley Hospital: An historical survey*. Unpublished Third Kenneth Cameron Memorial Lecture, Institute of Psychiatry Library.
- Wechsler, D. (1986). *Wechsler Adult Intelligence Scales – Revised*. New York: Psychological Corporation.
- Wechsler, D. (1992). *Wechsler Intelligence Scales For Children – Revised*. New York: Psychological Corporation.
- Weersing, V. R., & Weisz, J. R. (2002a). Mechanisms of action in youth psychotherapy. *Journal of Child Psychology and Psychiatry*, 43, 3–29.
- Weersing, V. R., & Weisz, J. R. (2002b). Community clinic treatment of depressed youth: benchmarking usual care against CBT clinical trials. *Journal of Consultant Clinical Psychology*, 70, 299–310.
- Weisz, J. R., Weersing, V. R., & Henggeler, S. W. (2005). Jousting with straw men: Comment on Westen, Novotny, and Thompson-Brenner (2004). *Psychological Bulletin*, 131, 418–426.
- White, C. (2005). Christopher Gillberg, the psychiatrist at the centre. *British Medical Journal*, 331, 180.
- Wolpe, J. (1958). *Psychotherapy of reciprocal inhibition*. Stanford, CA: University Press.
- Wolraich, M. L. (2003). Annotation: The use of psychotropic medications in children: an American view. *Journal of Child Psychology and Psychiatry*, 44, 159–168.
- Woodhouse, W., Bailey, A., Rutter, M., Bolton, P., Baird, G., & Le Couteur, A. (1996). Head circumference in autism and other pervasive developmental disorders. *Journal of Child Psychology & Psychiatry*, 37, 785–801.
- World Health Organization. (1996). Multiaxial classification of child and adolescent psychiatric disorders: *The ICD-10 classification of mental and behavioural disorders in children and adolescents*. Cambridge, UK: Cambridge University Press.
- Yule, W., & Berger, M. (1972). Behaviour modification principles and speech delay. In: M. Rutter & J. A. M. Martin (Eds.), *The child with delayed speech* (pp. 204–219). *Clinics in Developmental Medicine No 43*. London: Heinemann/Spastics International Medical Publications.
- Zoghbi, H. Y. (2003). Postnatal neurodevelopmental disorders: Meeting at the synapse? *Science*, 302, 826–830.