# Disentangling Child and Family Influences on Maternal Expressed Emotion Toward Children With Attention-Deficit/Hyperactivity Disorder

Kim L. Cartwright, M.Sc., Paraskevi Bitsakou, Ph.D., David Daley, Ph.D., Richard H. Gramzow, Ph.D., Lamprini Psychogiou, Ph.D., Emily Simonoff, M.D., Margaret J. Thompson, M.D., Edmund J. S. Sonuga-Barke, Ph.D.

**Objective:** We used multi-level modelling of sibling-pair data to disentangle the influence of proband-specific and more general family influences on maternal expressed emotion (MEE) toward children and adolescents with attention-deficit/hyperactivity disorder (ADHD). **Method:** MEE was measured using the Five Minute Speech Sample (FMSS) for 60 sibling pairs (aged 5 through 17 years) each comprising one proband with ADHD and one child without ADHD. Questionnaire measures were used to assess child and adolescent conduct and emotional problems and maternal depression and ADHD. Multi-level models partitioned the effects of five MEE components (initial statement [IS], relationship [REL], warmth [WAR], critical comments [CC], and positive comments [PC]) into proband-specific and general family effects. **Results:** Significant proband-specific effects were confirmed for all MEE components, with higher levels of MEE expressed toward probands with ADHD than siblings without ADHD. For REL, PC, and CC, this effect was explained by comorbid child conduct problems rather than ADHD. Only low WAR was associated with child ADHD itself. Furthermore, only low WAR was related to variations in more general family characteristics, especially levels of maternal depression. **Conclusions:** MEE toward children with ADHD was influenced by proband-specific factors. For most components, these were driven by comorbid symptoms of conduct problems rather than ADHD itself. WAR was different; it was influenced by both child-specific and more general characteristics of the family. Further studies utilising a longitudinal design are required to establish the direction of causation and extend our understanding of the relationship between EE components and ADHD. J. Am. Acad. Child Adolesc. Psychiatry, 2011;50(10):1042–1053. **Key Words:** ADHD, expressed emotion, sib-pairs, child effects, family effects

Variations in patterns of family interaction moderate the course and outcome of attention-deficit/hyperactivity disorder (ADHD).[1] Expressed emotion (EE) is a measure of the level of criticism and/or emotional involvement expressed by parents (or family members) toward their children (or relatives) that may be implicated in some of these effects.[2] Traditionally, individuals are classified as high in EE if their number of critical comments exceeds a set threshold or they show any signs of hostility or marked emotional overinvolvement[2]. In general, parental EE shows both concurrent[3-5] and longitudinal[6] associations with internalizing and externalizing problems in child and adolescent community and clinical populations. More specifically, parental EE (especially criticism) is associated with their children's ADHD.[7,8] For example, criticism is associated with both subtypes of ADHD in both clinic- and community-based samples.[6-8] The association between child ADHD and parental EE might be important clinically as it may drive some aspects of negative developmental trajectories associated with

This article is discussed in an editorial by Dr. Benjamin Lahey on page 975.

ADHD. Low levels of warmth and high levels of criticism at age seven were found to predict the extent to which children with ADHD developed conduct disorder.[9] Therefore, if the causes of high EE could be targeted then, in principle, developmental outcomes for children with ADHD could be improved. Unfortunately, little is known about what causes high EE in response to ADHD. For instance, it remains uncertain whether high levels of EE directed toward the child with ADHD represent (a) a general tendency of the parents of children with ADHD to be critical that affects all members of their family (whether or not the child has ADHD), or (b) a child-specific response elicited by the characteristics of the individual child with ADHD. Treatment trials suggest that parental negativity is at least in part a response to the behavior of the child with ADHD: medication-induced reductions in symptoms are associated with reductions in parental negativity during parent-child interactions.[10-12] However, these studies do not measure the extent to which such short-term changes would be related to more general reductions in patterns of hostility and criticism indexed by EE or the extent to which family dynamics or parental characteristics influence either initial levels of hostility or the treatment effects.

One way to address this question is to compare different parental responses to probands with ADHD and siblings without ADHD within the same family. Such an analysis is feasible as EE can be reliably estimated separately for each child.[13] This design allows the influence on parental EE associated with parental and other general family characteristics that differ between families but are shared by the two children to be disentangled from individual child characteristics that differ between probands with ADHD and siblings without ADHD within families. Multilevel modelling approaches to such proband-sibling data nested within families allow the relative contribution of each to be estimated. Furthermore, they can provide estimates of the importance of different specific family and child characteristics in explaining these two types of effects. It remains uncertain whether it is ADHD per se or other aspects of the make-up of the child with ADHD that are associated with high parental EE. In terms of child characteristics, one study demonstrated that not only was the EE-ADHD association stronger than an EE-conduct disorder (CD)/oppositional defiant disorder (ODD) link, but the EE-CD/ODD relationship did not withstand control of ADHD.[6] These findings are consistent with an earlier study in which comorbid CD/ODD was not related to high parental EE,[14] but are contradicted by the finding that ADHD and maternal high EE was driven by the child's co-occurring conduct and emotional problems.[8] In terms of more general putative familial influences on high parental EE, there are a number of obvious candidates to explore. There is a high prevalence of psychological problems in the parents of children with ADHD, especially adult ADHD itself,[15] but also depression, anxiety,[16] and aggression.[17] Maternal depression is associated with parental criticism and hostility[18] and aggression in parents is linked to poor parenting practices.[19]

The final question to be addressed relates to the extent to which different aspects of EE show a similar set of proband-specific and/or more general family influences. Previous studies have suggested only moderate correlations between EE components initial statement, warmth, relationship, critical comments, and emotional over involvement[7]: EE elements overlap to some degree, but each has the potential to afford discrete information. This leaves open the possibility that different components may be independently related to proband-specific effects and general family effects. For instance, it can be hypothesized that EE components most directly linked to a response to challenging behavior (e.g., criticism) would be most strongly subject to proband-specific influences while other aspects of EE (e.g., warmth) could be affected by more general characteristics of the family. Maternal depression has been linked specifically with low parental warmth[20] and low warmth in parents with depression may be linked to increased rates of externalizing child behavior.[21]

The current study had the following aims: to estimate the size of proband-specific and more general family influences on maternal EE toward probands with ADHD and their siblings without ADHD; to identify whether proband-specific effects are due to ADHD or to other child characteristics; to examine the role of maternal mental health in general family effects found; and to explore whether different components of maternal EE had different patterns of proband-specific and general family influence.

## METHOD

### Participants

Participants were British children and adolescents of white ethnicity with a clinical diagnosis of *DSM-IV*