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Editorial

Mood dysregulation across developmental psychopathology — general concepts and disorder specific expressions

Mood regulation problems are a common source of concern for clinicians, parents and young people alike. Some forms of mood dysregulation – in particular, perhaps, those involving depressed and elated mood – have received extensive research attention across the years. By contrast, there is vanishingly little research on irritable mood, anger and touchiness, even though these problems are among the most prominent that any clinician is likely to encounter.

The aim of this Special Issue (SI) is to help build an evidence base on mood regulation problems of this kind, and to stimulate further research in the field. The guest editors of the SI are extremely grateful to the contributing authors, who responded with enthusiasm to the invitation for contributions addressing this key issue in psychopathology. Each article went through JCPP's standard rigorous process of external review. The contributions are important not least because they challenge a number of long-held views, highlight the clinical relevance of mood regulation problems, and identify areas where there is a pressing need for further research. We hope that the SI will provide clinicians (who often feel ill-equipped to deal with such forms of mood dysregulation), with some practically translatable knowledge. We also hope it will offer researchers a framework for approaching outstanding questions about aetiology, and for exploring the mechanisms that underlie the problems many children and young people face in regulating their moods.

Measuring mood dysregulation

A first prerequisite for advance in these areas is the availability of valid and reliable measurement tools. At this stage, mood dysregulation is rarely if ever measured in clinics, and research on how to ascertain it in other settings has been scarce. Two articles in the current issue mark advances this area. First, the article by *Wakschlag and colleagues* deals with the measurement of temper tantrums in a community sample of preschoolers. They used an extensive set of questions relating to the intensity of tantrums and, crucially, the context in which they occur. They then analysed the data using item response theory, a statistical approach to modeling the probability of people (in this case mothers) endorsing particular items. The findings showed that frustration in

expectable contexts was very common (over 80%), while there were only few children with tantrums that occurred unexpectedly, or at high frequency, or who had long-lasting tantrums. Such findings could provide a particularly valuable yardstick of assessment for clinicians.

The article by *Stringaris and colleagues* addresses older age-groups, and introduces a concise new scale (the ARI – Affective Reactivity Index) to capture irritability in children and adolescents. Preliminary tests in the US and UK, and in both clinical and non-clinical samples, suggest that it could be useful for clinicians, and also in research; the items form an internally consistent, single factor, and scores discriminate sub-groups of young people with different problems in theoretically meaningful and predictable ways.

Early development of mood dysregulation

Mood regulation problems are thought to begin very early in the life course, as extensively discussed in several of the articles in this SI. However, questions about their structure and developmental trajectory remain. Focusing on this early developmental period, *Martinos et al.* examine links between infant temperament and electrophysiological measures of attention. It is known that infants capable of sustained attention are also better at mood regulation. The findings by *Martinos and colleagues* indicate that infants' emotion regulation abilities are linked to the peak latency of Nc, a neurophysiological marker of attention. Also, children's ability to self regulate is differentially linked to Nc amplitude in response to emotional cues (fearful vs. happy faces). These findings reveal early brain mechanisms of mood regulation and further the case for focusing on attentional processes as a potential target for intervention.

Moving to slightly older ages, *Ezpeleta and colleagues* use data from a community sample of preschoolers to examine the factor structure and validity of dimensions of oppositionality as measures

The findings presented in this special issue provide a rich picture of mood regulation problems, their relationship with psychopathology and personality structure, and their implications for treatment

of mood dysregulation. Their approach is prompted by findings in older children and adolescents that Oppositional Defiant Disorder (ODD) is a complex multidimensional category, encompassing not only disruptive behaviour problems but also indicators of dysregulated mood. Although the specifics of these past findings vary somewhat, key features include the identification of an irritable/affective dimension within ODD that seems more strongly associated with risk for internalizing than externalizing difficulties, and a corresponding subset of headstrong/oppositional behaviours that carries stronger risks for later disruptiveness. *Ezpeleta and colleagues* extend tests of these models to preschoolers, and conclude that similar dimensions of oppositionality, with moderate to acceptable reliability and convergent and discriminant validity with other psychological constructs, can be identified very early in life.

Mood dysregulation and disorder

Understanding the relationship between mood regulation and other psychiatric disorders poses a key challenge. Previous research, discussed in detail in various places in the SI, suggests that mood dysregulation is associated with a wide range of disorders, and particularly with psychiatric comorbidity. Moreover, children with psychiatric disorders who also have mood dysregulation problems seem more impaired than those who do not. These findings pose challenges for psychiatric nosology (how should we account diagnostically for mood dysregulation?) and also for aetiological research (what mechanisms underlie the overlap of mood dysregulation with psychiatric disorders?) This SI hosts five articles with new findings directly relevant to these topics.

The article by *Adleman et al* uses structural magnetic resonance imaging to tackle one of the major controversies in psychiatry in recent years: the boundaries of bipolar disorder in young people. Mood dysregulation in the form of irritability has been at the very centre of this debate, and has received considerable international attention. The study by *Adleman et al* uses a longitudinal design to compare the brain structure of children with severe mood dysregulation (SMD, a phenotype of severe and persistent irritability), bipolar disorder (BD) and healthy volunteers. They find that SMD and BD show overlaps in brain structure that differentiate them from healthy volunteers. However, they also find that children with BD can be differentiated from those with SMD cross-sectionally, and also in the aberrant developmental trajectories of certain brain structures, such as the lateral parietal cortex and precuneus, that seem characteristic of BD. These findings add to the evidence suggesting that severe and persistent irritability is unlikely to be an early manifestation of bipolar disorder.

The overlap between ADHD and mood dysregulation is a second area of intense scientific interest that

carries important clinical implications. Anger outbursts, tantrums, and easy annoyance have long been observed to occur with considerable frequency in children suffering with ADHD; what is unclear, however, is whether mood dysregulation problems in children with ADHD arise from the neuropsychological characteristics of the disorder. *Banaschewski et al* address this question in a large sample of children with ADHD, their unaffected siblings and controls using a battery of neuropsychological tests that tap into processes such as prepotent inhibition and delay aversion. Their findings cast doubt on the hypothesis that emotional lability (the authors' preferred description of mood dysregulation) is directly linked to such neuropsychological deficits. The authors show that the link between neuropsychological deficits and emotional lability is largely accounted for by the association of ADHD with such deficits. These findings suggest that mood dysregulation is independent of such cognitive and motivational deficits at least in those with ADHD, and emphasize the need to consider alternative mechanisms that could account for the overlap.

Mood dysregulation is also common in autism; indeed, drugs such as risperidone and aripiprazole have been licensed for the treatment of irritability in autism in the US. To date, however, there is a dearth of evidence about the nature of these overlaps, and *Simonoff and colleagues* provide some of the first systematic evidence from a large and representative sample of children and young people with Autism Spectrum Disorders (ASDs). They find that the severity of autism and mood dysregulation are strongly associated. Links between mood problems and emotional symptoms in children with ASDs were similar to those reported in typically-developing children. They find less evidence, however, that neurocognitive correlates of mood problems identified in the general population, such as emotion recognition and cognitive rigidity, are also related to mood problems in children with ASDs. This raises the important question as to whether the mechanisms of overlap between mood dysregulation and ASD are specific to this disorder.

The next two articles take a different approach, using longitudinal data to explore the implications of mood dysregulation over time. As noted earlier, a number of recent studies have highlighted an intriguing pattern whereby irritability at one stage in the life course is associated with increased risk for emotional difficulties later in development. *Barker and colleagues* extend this approach to explore early adolescent callous-unemotional traits and internalising difficulties, as outcomes of childhood irritability. They also begin the important process of identifying mediators of 'heterotypic' continuities of this kind, focusing on victimization by peers. Using data from a large general population sample they find that irritability in late childhood does indeed increase the likelihood of peer victimization – but

that victimization can also function to exacerbate irritability. By early adolescence, some combinations of these earlier influences increase risks for internalizing problems, while others seem more salient for callous-unemotional traits. As the authors argue, knowledge of environmental stressors as well as behavioural characteristics may be important in planning treatments for children with irritable dispositions.

Burke uses a longitudinal design to explore the overlap of mood dysregulation with later internalizing problems and personality characteristics in a referred sample studied from childhood into early adult life. The results confirm previous findings of a robust relationship between irritability and later depression and anxiety. Importantly, they also show that irritability is a predictor of the personality trait of neuroticism, but not of other personality traits. This sets the scene for much-needed research on the boundaries between mood regulation problems and personality structure.

Finally, we explore the implications of mood dysregulation for treatment outcomes. According to a long-held view, children with mood regulation problems are particularly difficult to treat. This view may not only be counterproductive for the therapeutic relationship, but also incorrect. *Scott and O'Connor*, using data from a parenting intervention trial for antisocial children, challenge this notion by examining whether treatment effectiveness is moderated by the presence of dysregulated mood. The results indicate that the parents of children with and without dysregulated mood made similar changes to their parenting following the intervention. The behavior of emotionally dysregulated children had improved significantly at one-year follow-up. Non-emotionally dysregulated children did not show significant improvement, however. If replicated, these findings have important implications for treatment decisions in clinical settings and make ascertainment of mood regulation problems an important goal.

Taken together, the findings presented in this special issue provide a rich picture of mood regulation problems, their relationship with psychopathology and personality structure, and their implications for treatment. It is encouraging that mood regulation problems are now measurable in ways likely to be meaningful for clinicians, and it is

important to remember that they present very early in development. Difficulties in mood regulation occur in a wide range of disorders, and the findings in this SI challenge some commonly-held notions about the mechanisms underlying this overlap. It appears that some of the usual suspects – such as inhibitory deficits in the case of ADHD – may not be adequate to explain the overlap with mood dysregulation. The articles in this issue indicate new avenues that researchers could pursue to better understand why some children with psychiatric disorders also have problems in regulating their mood. Similarly, the results presented here contest the long-standing view that mood regulation problems are invariably a hindrance to clinicians' efforts and treatments. Overall, it appears that mood regulation problems may afford an opportunity to reconsider treatment strategies as much as mechanisms underlying psychopathology.

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References

Articles in this issue (with author names italicised on first mention above) are listed and linked in the online table of contents for this issue, available at: <http://onlinelibrary.wiley.com/doi/10.1111/jcpp.2012.53.issue-11/issuetoc>