

reported by Jansen et al<sup>4</sup> in 3-year-old children. Research suggests that impaired neuromotor development precedes schizophrenia onset, although most children with impaired neuromotor functioning do not develop schizophrenia.<sup>2</sup> In contrast, children who later met criteria for BD exhibited a higher level of motor performance during childhood than controls.<sup>1</sup> Our results highlight that the genetic predisposition for schizophrenia covaries with motor deficits observable during infancy in a community-based sample. Given that the prevalence of schizophrenia is low, these early features represent indices of liability rather than precursors of the disorder.

This study has certain limitations. Genetic pleiotropy or early environmental factors could also explain the association.<sup>1</sup> Selective nonresponse to neuromotor assessment could bias the analysis. The power of the BD GWAS might have been insufficient to detect associations between BD PRS and neuromotor development. Despite limitations, this study has several strengths, including an objective and prospectively assessed measure of neuromotor development in a large homogeneous sample of infants.

To our knowledge, this is the first evidence that genetic liability for schizophrenia may covary with altered neuromotor development in infancy. Future research will show whether early neuromotor development can support early screening of susceptible groups possibly defined by genetic risk.

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**Accepted for Publication:** September 20, 2017.

**Published Online:** November 8, 2017. doi:[10.1001/jamapsychiatry.2017.3459](https://doi.org/10.1001/jamapsychiatry.2017.3459)

**Author Contributions:** Drs Serdarevic and Tiemeier had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

**Study concept and design:** Serdarevic, Jansen, Jaddoe, Tiemeier.

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**Obtained funding:** White, Posthuma, Tiemeier.

**Administrative, technical, or material support:** White.

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**Conflict of Interest Disclosures:** None reported.

**Funding/Support:** Dr Tiemeier was supported by NWO 024.001.003 from the Dutch Ministry of Education, Culture and NWO 016.VICI.170.200 from the Science and the Netherlands Organization for Scientific Research Consortium on Individual Development. Dr Serdarevic was supported by grant 2013-2548/001-001-EMA2 from Erasmus Mundus Western Balkans postdoctoral scholarship financed by the European Commission. Dr Jansen was supported by grant SSWO S14-27 from the Sophia Foundation for Scientific Research. The Generation R Study is supported by the Erasmus Medical Center–Rotterdam, the Erasmus University Rotterdam, the Netherlands Organization for Scientific Research, and the Ministry of Health, Welfare, and Sport.

**Role of the Funder/Sponsor:** The funding organizations had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

**Additional Contributions:** We gratefully acknowledge the contribution of participating mothers, general practitioners, hospitals, midwives, and pharmacies in Rotterdam. Frank C. Verhulst, MD, PhD (Department of Child and Adolescent Psychiatry and Psychology, Erasmus Medical Center), and Tamara van Batenburg, PhD (Department of Child and Adolescent Psychiatry and Psychology, Erasmus Medical Center), provided neuromotor data. They did not receive compensation for their contribution to this study.

**Additional Information:** Drs Serdarevic, Jansen, and White are members of the Generation R Study Group, Erasmus Medical Center Rotterdam, the Netherlands.

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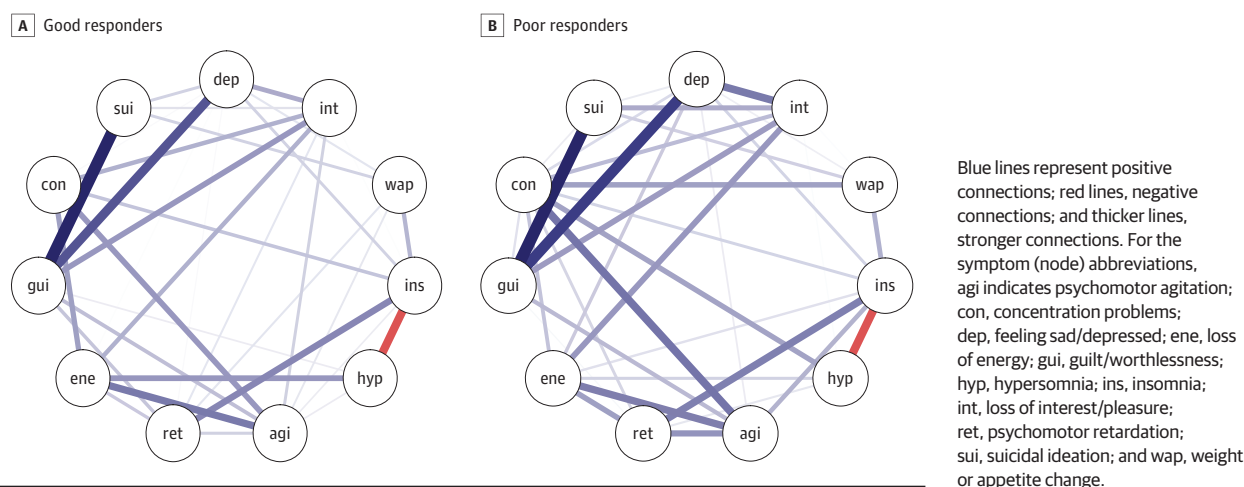
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## Assessment of Symptom Network Density as a Prognostic Marker of Treatment Response in Adolescent Depression

One in 4 adolescents with depression does not respond favorably to treatment.<sup>1</sup> Prognostic markers to identify this nonresponder group are lacking and urgently needed.<sup>2</sup> It has been suggested that the network structure of depressive symptoms (ie, group-level covariance or connectivity between symptoms) may be informative in this regard.<sup>3</sup> Intuitively, one may expect that more densely connected networks would be more inclined to result in negative spirals (eg, sleeplessness causes an individual to be too tired to go out, which leads to a lack of friends, resulting in sadness) and therefore more liable to non-response. An influential naturalistic study by van Borkulo et al published in *JAMA Psychiatry*<sup>3</sup> reported that adult patients with depression who continue to experience problems in sub-

**Figure 1. Network Structures of Depressive Symptoms in 233 Relatively Good and 232 Poor Responders to Treatment**



sequent years have more densely connected networks at baseline than patients who later recover. Here, we performed a conceptual replication of that study in adolescents with depression who participated in a psychological treatment trial. We tested whether network characteristics at baseline were prognostic for long-term outcomes.<sup>1</sup>

**Methods** | Patients with depression completed the 33-item Mood and Feelings Questionnaire (MFQ) prior to treatment, with regular additional assessments up to 12 months after the end of treatment (ie, mean [SD], 22 [4.7] months after baseline assessment). The MFQ assesses recent self-reported depressive symptoms on a 4-point scale (never, sometimes, often, and always), with total scores ranging from 0 to 66 (higher scores indicate more severe depressive symptoms).<sup>4</sup> In accordance with van Borkulo et al,<sup>3</sup> 11 items optimally representing *DSM-5* symptoms of depression were selected for use in the present study conducted from June 29, 2010, to January 17, 2013, with data analyses performed from February 1 to June 25, 2017. The study was approved by the Cambridgeshire Research Ethics Committee and local National Health Service provider trusts. All patients and parents gave written informed consent.

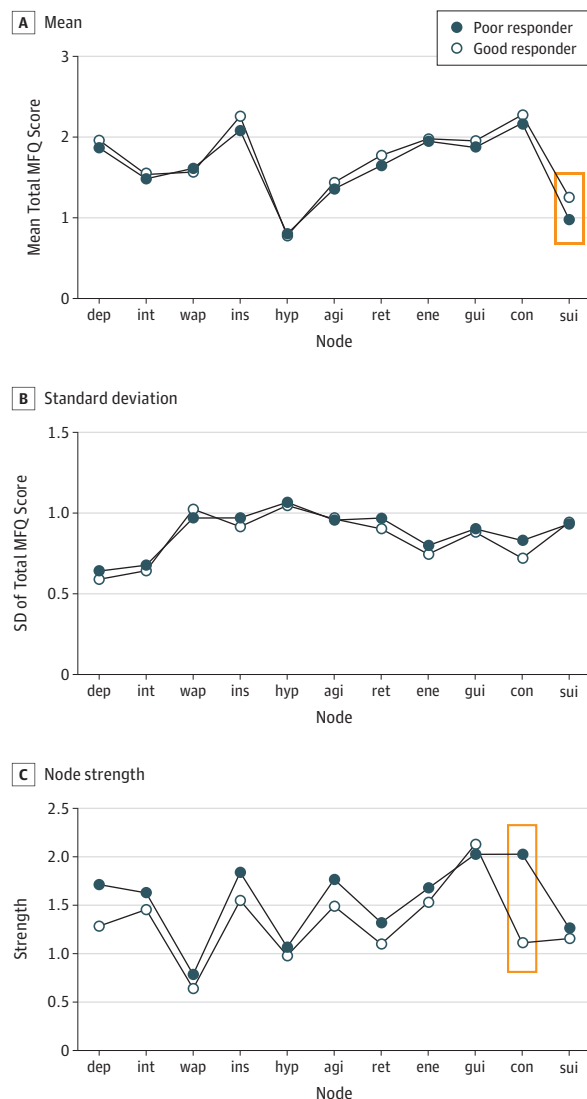
To derive 2 equally sized groups, relatively good and poor responders were differentiated by the median percentage change between baseline and final follow-up of the MFQ summary score (median [interquartile range], −66% [41.2%]). Baseline regularized partial correlation matrices were estimated based on Spearman correlation coefficients.<sup>5</sup> From those, the weighted sum of all absolute connections in the network (network density) as well as in each node (node strength) was derived. Parameters were compared using permutation testing (global  $\alpha = .05$ ; adjusted  $\alpha$  per node per item,  $.05/11 = .005$ ; 1-sided).<sup>6</sup> All analyses were performed using R, version 3.2.4 (The R Foundation), with the qgraph package, version 1.3.5.

**Results** | The cohort consisted of 465 adolescents with depression (349 [75.1%] were girls; aged 11-17 years). Good

responders had higher mean (SD) MFQ summary scores at baseline (47.5 [9.2] vs 44.3 [11.6];  $P = .006$ ) and higher mean (SD) levels of suicidality (1.25 [0.9] vs 1.00 [0.9];  $P < .001$ ) compared with poor responders. Although global network strength was higher in poor responders, the difference was not significant (good responders, 3.6; poor, 4.3;  $P = .15$ ; **Figure 1**). There were no differences in local node strength except for that of “concentration problems,” which at the uncorrected  $\alpha$  level was more connected to the other nodes in the poor responders than in the good responders (good responders, 1.1; poor responders, 2.0;  $P = .02$ ; **Figure 2**). Sensitivity analyses indicated similar findings when treatment response was defined as below clinical threshold (ie, MFQ score  $<27$ ) at the final follow-up.<sup>4</sup>

**Discussion** | Applying the same statistical methods as those used in the study by van Borkulo et al,<sup>3</sup> which had a similarly sized sample of adults with depression followed up naturalistically, we found no significant association between higher network strength and poorer outcomes. That the direction of the association in our study was consistent with the results of the previous study, however, indicates that further investigation of the validity of network strength as a prognostic marker is warranted. There were 2 important methodological differences between the studies. First, the previous one was a naturalistic cohort study, whereas here we evaluated treatment outcomes. Stronger symptom networks may be prognostic of depression persistence in naturalistic settings but not when symptoms (and perhaps networks) are actively being challenged. Second, network density may not have equal prognostic value in adult and adolescent groups. For instance, denser networks may be a consequence and a behavioral marker of longer illness duration or recurrent episodes but have no such signature in first-episode depression in adolescents. Unfortunately, this hypothesis cannot be tested within the current sample of adolescents with depression, most of whom were experiencing their first episode.

**Figure 2. Differences in Total Mood and Feelings Questionnaire (MFQ) Mean Score, SD of the Mean Score, and Node Strength by Symptom Between Good and Poor Responders to Treatment**



Red boxes outline statistically significant differences. Symptom (node) abbreviations are defined in the caption to Figure 1.

With network analyses taking an astonishing flight in psychiatry, we recommend cautious application of group-level network density as a prognostic marker. Crucial steps to be taken by the field include further replication studies as well as in-depth psychometric evaluation of the reliability and clinical correlates of network parameters.

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**Accepted for Publication:** October 3, 2017.

**Published Online:** November 29, 2017. doi:10.1001/jamapsychiatry.2017.3561

**Author Contributions:** Drs Schweren and Fried had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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**Acquisition, analysis, or interpretation of data:** All authors.

**Drafting of the manuscript:** Schweren, Goodyer.

**Critical revision of the manuscript for important intellectual content:** All authors.

**Statistical analysis:** All authors.

**Obtained funding:** Goodyer.

**Administrative, technical, or material support:** Schweren, Goodyer.

**Study Supervision:** Fried.

**Conflict of Interest Disclosures:** Dr Goodyer reported serving as a paid consultant for Lundbeck and licensing the Brief Psychosocial Intervention to Lundbeck for use in a clinical trial. No other disclosures were reported.

**Funding/Support:** The Improving Mood with Psychoanalytic Psychotherapy and Cognitive Behaviour Therapy (IMPACT) trial was funded by the Health Technology Assessment program of the National Institute for Health Research (06/05/01). Dr Schweren is a research associate funded by the Friends of Peterhouse. Drs Fried and van Borkulo are funded by Consolidator Grant 647209 from the European Research Council.

**Role of the Funder/Sponsor:** The funding sources had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; or the decision to submit the manuscript for publication.

**Additional Contributions:** We thank all members of the IMPACT consortium.

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## Pediatric Use of Antipsychotic Medications Before and After Medicaid Peer Review Implementation

In response to the growing cardiometabolic safety concerns about the use of atypical antipsychotic (AAP) medications in children,<sup>1,2</sup> several state Medicaid agencies have adopted a novel, more clinically nuanced and individualized approach to reviewing the appropriateness of AAP use, namely, peer review prior authorization (PA) policies.<sup>3</sup> Physicians must receive preapproval through contracted clinicians (peer reviewers) to prescribe AAPs to certain-aged children. We assessed the effect of peer review PA policies on AAP use among Medicaid-insured youth according to age restriction criteria.