



Emotion regulation as central to psychopathology across childhood and adolescence: a commentary on Nobakht et al. (2023)

Spencer C. Evans,  and Shannon Shaughnessy 

Department of Psychology, University of Miami, Coral Gables, FL, USA

Oppositional defiant disorder: manifestations and mechanisms

Oppositional defiant disorder (ODD) is a significantly impairing behavioral condition, which affects ~3%–5% of youth in the population and represents one of the most common reasons for clinical referrals (Hawes et al., 2023). Developmental pathways and presentations of ODD are heterogenous and largely defined by two main symptom dimensions: *defiance* (i.e. argumentative/defiant/headstrong behavior) and *irritability* (i.e. angry/irritable mood). Substantial progress has been made toward understanding the genetic, neurobiologic, psychological, and social-environmental factors implicated in the development and maintenance of ODD, and evidence-based treatments like behavioral parent training are typically effective. However, key questions remain regarding how irritability and defiance develop over time (i.e. mechanisms of etiology and development) and how interventions might help (i.e. mechanisms of prevention and treatment; Hawes et al., 2023). This limited mechanistic understanding is unfortunate because developing and refining interventions requires clear theoretical models and empirical tests of not only whether interventions work, but also *how* they work. A better understanding of the mechanisms driving changes in irritability, defiance, and total ODD symptoms could lead to important advances in clinical care.

The data needed to answer such questions cannot solely come from experimental or intervention research. While treatment studies are useful, they typically focus on clinical outcomes, not mechanistic questions, and they are often underpowered. Such studies are not likely to yield generalizable answers to questions about how change occurs. Studies that can help answer such questions include large-scale, long-term longitudinal designs that collect repeated measures via multiple informants, methods, and intervals across development. These studies could tell us more about why a child might experience increases or decreases in their symptoms over time, which could lead to better understanding and treatment.

Victimization and emotion regulation as putative pathways

To this end, Nobakht, Steinsbekk, and Wichstrøm (2023) investigated the development of ODD symptoms from early childhood (age 4) through mid-adolescence (age 14) – a key period for onset, maintenance, and peak prevalence of the disorder (Hawes et al., 2023). The authors looked at two variables as putative factors contributing to the development of ODD: emotion regulation (ER) and victimization.¹ In their longitudinal model, ER and victimization can be interpreted as two competing hypotheses about etiology: That is, for a given child, to what extent are longitudinal increases in ODD symptoms predicted by them having previously experiencing (a) decreased ER and/or (b) increased victimization?

Nobakht et al. (2023) used a large sample ($N = 1,042$) from the Trondheim Early Secure Study, an ongoing, prospective cohort study following a representative Norwegian sample born in 2003–2004 (ntnu.edu/tess). Data were collected biennially over six waves, roughly at ages 4, 6, 8, 10, 12, and 14. Study strengths include the large sample size and rigorous measurement; the authors used multiple informants (parents, teachers, and youths) and methods (rating scales and diagnostic interviews). This approach makes it harder to detect significant associations given that these associations cannot be artificially inflated through mono-informant or mono-method biases. ODD symptom counts (not a perfect ODD severity indicator, but not a bad one either) were measured via structured diagnostic interviews (PAPA/CAPA) given to parents, adding youth-report at older waves when it became developmentally appropriate. Children's ER was assessed at ages 6–14 by teacher-report on the ER Checklist. Finally, victimization was assessed at ages 8–14 by child self-report using the Revised Olweus Bully Victimization Scale. Random intercept cross-lagged panel models (RI-CLPMs) were estimated to examine associations among ODD, ER, and victimization over time. Notably, the RI-CLPM extends the standard CLPM by adding random intercepts at the *between-person* level, which means the cross-lagged and autoregressive paths isolate relations between variables as they occur at the *within-person* level. In

Conflict of interest statement: No conflicts declared.

other words, the RI-CLPM allows researchers to test whether changes in X predict changes in Y over time, while taking into account the between-person differences and trait-like stability in these variables (Orth, Clark, Donnellan, & Robins, 2021).

Indeed, the most fascinating aspects of Nobakht et al.'s (2023) findings emerged from disentangling within- vs. between-person variance. At a within-person level, reductions in ER predicted increases in ODD symptoms 2 years later – a result that was consistent across all 4 of 4 possible intervals. Further, these ER effects predicted within-person increases for irritability and defiance equally, suggesting that ER is a significant driver behind *both* of ODD's key symptom dimensions (Hawes et al., 2023). In striking contrast, victimization did not predict ODD symptoms from any occasion to the next – that is, across 0 of 3 possible intervals. These results provide a clear answer to the competing hypotheses noted above, suggesting that *poor ER, but not victimization*, drives increases in ODD symptoms from middle childhood through adolescence.

Other interesting findings emerged at a between-person level. Mean ODD symptoms increased from ages 4 to 10 and decreased thereafter. Both victimization and ER decreased from ages 8 to 10, after which ER continued to decrease and victimization plateaued. This suggests something important about ER: on average, teacher-reported ER *decreased* as children got older, from ages 8 to 10 ($d = -0.11$; $p = .03$), 10 to 12 ($d = -0.15$, $p = .005$), and 12 to 14 ($d = -0.34$, $p < .001$).² That is, most children got worse at regulating their emotions as they entered adolescence, and those who showed the sharpest declines in ER tended to show more irritability and defiance later on. Finally, these longitudinal results are overlain on top of stable trait-like associations: ODD was significantly correlated with ER but not victimization, meaning that children who generally had more severe symptoms of ODD also tended to be worse at regulating their emotions overall. As the authors note, these findings must be interpreted within this particular Norwegian context (where rates of ODD are lower than other countries) and in light of the 2-year intervals (as shorter or longer intervals might reveal different findings; Nobakht et al., 2023). Still, these findings are intriguing and suggest potentially important implications.

Findings are functions of models: different options for different inferences

Nobakht et al.'s use of the RI-CLPM to separate within- versus between-person effects warrants closer discussion. In recent years, criticisms of the CLPM and applications of the RI-CLPM have become quite popular (Orth et al., 2021). At the time of this writing, a targeted Google Scholar search on this topic (for 'random intercept cross-lagged panel

model' OR 'ri-clpm') yields ~1,540 results, of which 97% were published since 2015. But unlike certain properties of research studies (e.g. large samples and reliable measurements), there is no single longitudinal analytic model that can be considered an unqualified strength or better than its alternatives. Rather, *many* options for longitudinal models are available, with different ones being ideal for different purposes. Orth et al. (2021) describe and test not just two (CLPM vs. RI-CLPM) but seven different approaches to analyzing panel data, with each approach asking different, nuanced questions about change over time. These seven options are just within the cross-lagged panel space, to say nothing of other alternatives – for example, latent growth curve, growth mixture, multilevel, latent difference, and time series models.

These analytic nuances are not to be ignored. For example, the research question answered by the CLPM is as follows: Do individuals with low X *relative to others* experience subsequent *rank-order increases* in Y ? For RI-CLPM, the question is: When individuals experience *lower-than-usual* X , does this predict subsequent increases in Y *relative to themselves*? Orth et al. (2021) found that these different analytic approaches, when applied to the same data, led to different conclusions. They do not endorse one over the other, but recommend the CLPM for between-person questions and the RI-CLPM for within-person questions. To return to Nobakht et al. (2023), we wonder: Is it possible that ER predicting ODD is a within-person process, whereas Victimization predicting ODD is a between-person process? If so, their analysis was well-situated to detect the former but not the latter. These questions resonate with considerations of ecological context; victimization might be highly specific to the occasions, contexts, and lags of measurement. That is, victimization does not occur to the same youths or to the same degree every year. Rather, sometimes youths encounter peer difficulties related to a particular classroom, school-year, or classmate – all of which could change in subsequent years. For example, our team found that victimization unidirectionally predicted higher levels of irritability, anxiety, and depression over time in children ages 8–11 – but these effects emerged in a CLPM over the course of a single school year, from fall to spring (Karlovich, Fite, & Evans, 2023). Critically, the absence of within-person prospective effects from victimization to psychopathology in Nobakht et al.'s analysis should *not* be interpreted as evidence that victimization is unassociated with psychopathology. Ample research shows that victimization can be an important risk factor for internalizing and externalizing psychopathology across development, and there is a need for intervention and prevention efforts targeting youth who get victimized (Arseneault, Bowes, & Shakoor, 2010).

Is ER a central driver of psychopathology?

These findings from Nobakht et al. (2023) provide further support for the central role ER plays in the development of ODD. Notably, specific deficits in ER have also been implicated in other forms of psychopathology, including attention-deficit/hyperactivity disorder, conduct disorder, autism spectrum disorder, and disorders of mood, anxiety, eating, substance use, stress, and personality (Cole, Hall, & Hajal, 2017). Viewed in this context, Cole et al. have identified common denominators of ER (or perhaps more accurately, emotional *dysregulation*) across disorders: emotions change too abruptly or slowly, endure despite ineffective attempts to regulate them, interfere with appropriate behavior, and are context-inappropriate in their expression or experience. This work may raise the question of whether ER is related to psychopathology or a central pillar thereof. This is where findings such as Nobakht et al.'s (2023) can be especially informative. While it is true that ER did 'travel with' ODD in terms of concurrent associations, their findings also showed that decrements in ER consistently preceded increases in irritability and defiance across development. This association was markedly unidirectional; ODD symptoms did not predict subsequent changes in ER. Such findings lend much-needed evidence to a scientific space that is encumbered with theoretical and conceptual confusion (Cole et al., 2017). It seems that ER deficits may indeed be a driving force behind ODD, defiance, and irritability – the latter being a transdiagnostic feature associated with ODD as well as anxiety, depression, and other forms of psychopathology (Derella, Johnston, Loeber, & Burke, 2019).

Findings suggesting that ER drives the *development* and *maintenance* of youth psychopathology are suggestive for intervention, but they do not necessarily imply that ER would be an ideal treatment target or mechanism. This is where intervention studies are needed. For example, Derella et al. (2019) found that the Stop Now and Plan (SNAP) intervention led to improved ER skills, which in turn led to substantial reductions in irritability. That is, ER was the mechanism of change. More of this kind of evidence is now beginning to accumulate across psychopathology. One recent meta-analysis revealed small to moderate effects of interventions on youth ER outcomes, correlating to improvements in mood and anxiety (Moltrecht, Deighton, Patalay, & Edbrooke-Childs, 2021). New primary tests of intervention mediation hypotheses are now needed. In the same way that ER may be a central driver of psychopathology, the evolution of transdiagnostic interventions has allowed treatment programs to be developed that could centrally address myriad forms of psychopathology in youth – perhaps through their effect on ER. For example, the FIRST³ therapy program is currently being tested for its effectiveness

in treating youth anxiety, depression, trauma, and conduct problems in outpatient care – and whether these changes are mediated by improvements in ER (Bailin et al., 2023).

In conclusion, Nobakht et al.'s (2023) findings add meaningfully to a growing literature suggesting that ER may be a central driver and treatment target for ODD and psychopathology more broadly. Longitudinal studies – both observational and experimental – are needed to provide further tests of such hypotheses. But any research with longitudinal data must consider the precise theory and questions regarding the within- and/or between-person hypotheses being tested. There is a need for more research on ER, victimization, and psychopathology across development. Among the more pressing at this stage are *whether*, *how*, and *when* youths' ER can be modified (e.g. through which intervention strategies), and with *what* benefits for youths' mental health (e.g. how effective, and how effective across different disorders). If ER really is a central driver of youth psychopathology, it is time to leverage this knowledge for the benefit of youth and families.

Data availability statement

There are no data associated with this submission.

Endnotes

1. Nobakht et al. (2023) use the term 'bullying victimization' in their study. We use a slightly broader and more concise term, 'victimization,' to refer to a child being victimized by peers, including but not limited to bullying.
2. Although not reported in the paper, we estimated approximate effect sizes for the difference between one wave (t) and the next ($t + 1$) as Cohen's $d = ([t + 1] - t) / SD_{\text{pooled}(t, [t+1])}$ using M and SD estimates from Table 1 (Nobakht et al., 2023). Corresponding p -values are from their Table 2 representing tests of wave-to-wave changes in each variable.
3. A mnemonic device for Feeling calm, Increasing motivation, Repairing thoughts, Solving problems, and Trying the opposite.

Correspondence

Spencer C. Evans, Department of Psychology, University of Miami, 5665 Ponce De Leon Blvd, Flipse Building, Coral Gables, Florida, 33146, USA; Email: sevens@miami.edu

References

- Arseneault, L., Bowes, L., & Shakoor, S. (2010). Bullying victimization in youths and mental health problems: 'Much ado about nothing'? *Psychological Medicine*, 40, 717–729.

- Bailin, A., Cho, E., Sternberg, A., Evans, S. C., Hollinsaid, N. L., Bearman, S. K., & Weisz, J. R. (2023). Principle-Guided Psychotherapy for Children and Adolescents (FIRST): study protocol for a randomized controlled effectiveness trial in outpatient clinics. *Trials*, *24*(1). <https://doi.org/10.1186/s13063-023-07717-y>
- Cole, P.M., Hall, S.E., & Hajal, N.J. (2017). Emotion dysregulation as a vulnerability for psychopathology. In S.P. Hinshaw & T.P. Beauchaine (Eds.), *Child and adolescent psychopathology* (3rd edn) (pp. 346–386). Hoboken, NJ: Wiley.
- Derella, O.J., Johnston, O.G., Loeber, R., & Burke, J.D. (2019). CBT-enhanced emotion regulation as a mechanism of improvement for childhood irritability. *Journal of Clinical Child and Adolescent Psychology*, *48*(sup1), S146–S154.
- Hawes, D.J., Gardner, F., Dadds, M.R., Frick, P.J., Kimonis, E.R., Burke, J.D., & Fairchild, G. (2023). Oppositional defiant disorder. *Nature Reviews Disease Primers*, *9*, 31.
- Karlovich, A.R., Fite, P.J., & Evans, S.C. (2023). Bidirectional associations between peer victimization and emotional symptoms in youth: The moderating role of sleep quality. *School Mental Health*, *15*, 431–443.
- Moltrecht, B., Deighton, J., Patalay, P., & Edbrooke-Childs, J. (2021). Effectiveness of current psychological interventions to improve emotion regulation in youth: A meta-analysis. *European Child and Adolescent Psychiatry*, *30*, 829–848.
- Nobakht, H.N., Steinsbekk, S., & Wichstrøm, L. (2023). Development of symptoms of oppositional defiant disorder from preschool to adolescence: The role of bullying victimization and emotion regulation. *Journal of Child Psychology and Psychiatry*. Advance online publication. <https://doi.org/10.1111/jcpp.13845>
- Orth, U., Clark, D.A., Donnellan, M.B., & Robins, R.W. (2021). Testing prospective effects in longitudinal research: Comparing seven competing cross-lagged models. *Journal of Personality and Social Psychology*, *120*, 1013–1034.

Accepted for publication: 9 October 2023