

# Temper Tantrums in Healthy Versus Depressed and Disruptive Preschoolers: Defining Tantrum Behaviors Associated with Clinical Problems

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**Objective** To investigate whether differences in the tantrum behaviors of healthy versus mood and disruptive disordered preschoolers can be detected.

**Study design** Caregivers of 279 preschool children (3 to 6 years old) completed the Preschool-Age Psychiatric Assessment (Egger HL, Ascher B, Angold A. Preschool Age Psychiatric Assessment (PAPA): version 1.1. Durham, NC: Center for Developmental Epidemiology, Department of Psychiatry and Behavioral Sciences, Duke University Medical Center; 1999), which was used to determine preschoolers' diagnostic classification and to measure tantrum behaviors. Preschoolers were placed in 1 of 4 diagnostic groups, healthy, pure depressed, pure disruptive, and comorbid depressed/disruptive, on the basis of the application of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* algorithms. Parametric and non-parametric analyses were used to examine characteristics of children's tantrums: intensity, frequency, context, and recovery ability.

**Results** Disruptive preschoolers displayed violence during tantrums significantly more often than the depressed and healthy groups. The disruptive group had significantly more tantrums at school/daycare than the depressed and healthy groups. The disruptive group had a more difficult time recovering from tantrums than healthy preschoolers. In addition, depressed preschoolers were more aggressive toward objects and other people than healthy children. Finally, depressed preschoolers displayed significantly more self-harmful tantrum behaviors than preschoolers in the healthy and disruptive groups.

**Conclusion** These findings provide preliminary guidelines to parents, teachers, and practitioners in identifying tantrum behaviors that may be markers of a psychiatric disorder and therefore require mental health referral. (*J Pediatr* 2008;152:117-22)

Tantrums are common in early childhood, often prompting parents to seek consultation with pediatricians. Parents are often unsure about whether behaviors that occur during tantrums could indicate a serious behavioral problem. Although the popular press provides much information, surprisingly little empirical research has been conducted in this area.<sup>1</sup> The scant literature provides little information about potential "red flag" tantrum behaviors that cross the threshold into clinically significant problems or symptoms. Research providing empirical evidence that distinguishes normative versus clinically significant tantrum behaviors has important implications for advising caregivers and professionals.

Potegal and Davidson<sup>2</sup> found that common tantrum behaviors exhibited by 18- to 60-month-old children included behaviors such as crying and hitting, and occurred once a day on average, with a median duration of 3 minutes and with 75% of tantrums lasting between 1.5 and 5 minutes. Researchers have also found that 70% of 18- to 24-month-old children have tantrums.<sup>3</sup> Other authors have noted that the highest incidence of tantrums occur in the 3- to 5-year age range (75.3% of children).<sup>4</sup> A study of children exhibiting severe tantrums, found that 52% of these children had other non-tantrum-related behavioral/emotional problems.<sup>5</sup>

In this study, we hypothesized that the 3 diagnostic groups would have greater tantrum frequencies, durations, and intensities and have greater difficulty recovering from tantrums than the healthy group regardless of context. Specifically, it was expected that depressed preschoolers would display internally directed aggressive tantrums with higher frequencies, intensities, duration, and have more difficulty recovering from tantrums than

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ANOVA	Analysis of variance	MDD	Major depressive disorder
DSM-IV	<i>Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition</i>	OR	Odds ratio
		PAPA	Preschool Age Psychiatric Assessment

**Table I. Demographic characteristics of the current sample**

	Healthy (n = 150)	MDD-no dis (n = 21)	DIS-no mdd (n = 54)	MDD/DIS (n = 54)
Sex % (n)				
Male (n = 145)	47% (71)	48% (10)	55% (29)	65% (35)
Female (n = 133)	53% (79)	52% (11)	45% (25)	35% (19)
Age in Years % (n)				
3	30% (45)	29% (6)	43% (23)	20% (11)
4	47% (71)	24% (5)	42% (22)	41% (22)
5	23% (34)	48% (10)	15% (8)	39% (21)
Ethnicity (child) % (n)				
White	63% (95)	62% (13)	39% (21)	44% (24)
Black	31% (47)	20% (4)	41% (22)	39% (21)
Hispanic	0	0	4% (2)	0
Mixed race	5% (8)	10% (2)	17% (9)	15% (8)
Other	.7% (1)	5% (1)	0	2% (1)
Education % (n)				
Highest level some college	15% (23)	10% (2)	24% (13)	28% (15)
Highest level 4-year degree	58% (87)	76% (16)	63% (34)	56% (30)
Greater than 4-year degree	27% (40)	14% (3)	13% (7)	17% (9)
Marital Status % (n)				
Married	66% (99)	62% (13)	54% (29)	43% (23)
Seperated	2% (3)	10% (2)	2% (1)	6% (3)
Divorced	4% (6)	10% (2)	9% (5)	15% (8)
Widowed	1% (2)	0	0	0
Never married	27% (40)	19% (4)	35% (19)	36% (19)
Income % (n)				
0-\$20,000	22% (30)	16% (3)	36% (17)	35% (17)
\$20,001-\$40,000	13% (19)	11% (2)	15% (7)	27% (13)
\$40,001-\$60,000	17% (24)	21% (4)	17% (8)	18% (9)
\$60,000+	48% (67)	53% (10)	32% (15)	20% (10)

children in the healthy group. It was also expected that preschoolers with a disruptive disorder (ie, pure and comorbid) would have greater frequencies, durations, and intensities of tantrums and have more difficulty recovering from tantrums than preschoolers in the healthy and pure major depressive disorder (MDD) groups.

## METHODS

### Participants

Preschoolers between 3 and 5.11 years of age were recruited from multiple sites throughout the greater metropolitan St. Louis area for participation in a study examining the nosology of preschool depression. Recruitment was done through pediatricians' offices, primary care practices, and preschools/daycares that were accessible to the general community in an effort to increase the socioeconomic and ethnic diversity of the final sample. Specific sites of recruitment were chosen at random by using a geographically stratified method similar to studies that randomly choose zip codes. The Preschool Feelings Checklist,<sup>6</sup> a brief, validated screening measure for early-onset emotional disorders, was used to increase the likelihood of obtaining a sample with symptoms of depression. Earlier studies have indicated that the Preschool Feelings Checklist is a useful tool for identifying children who are at-risk for or who have mood disorders, disruptive disorders, or both.<sup>7</sup> Healthy preschoolers

and preschoolers with symptoms of depression, disruptive disorders, or both were recruited for study participation. Children with chronic medical illnesses, neurological problems, or both and children with pervasive developmental disorders, language, and/or cognitive delays were excluded from participation.

In the final sample, 304 children were ascertained, but only 279 were included in the analyses; 23 participants were excluded because of excessive missing tantrum data (Table I). All participants (n = 279) were categorized in the healthy group or 1 of the 3 diagnostic groups of interest. To be categorized as healthy, preschoolers did not meet DSM-IV criteria for any psychiatric disorder. The second group had *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) MDD without co-morbid attention deficit hyperactivity disorder, conduct disorder, and/or oppositional defiant disorder and was referred to as the "MDD-no dis" group. The MDD-no dis group was included so that tantrum characteristics specific to depression could be evaluated. The third group, comprised of preschoolers with DSM-IV attention deficit hyperactivity disorder, conduct disorder, and/or oppositional defiant disorder, but who had no diagnosis of MDD and were referred to as the "DIS-no mdd" group. Preschoolers with MDD and a disruptive disorder were referred to as the "MDD/DIS" group. Diagnostic classification was made on the basis of application of DSM-IV algorithms to symptoms as reported by caregivers. Sample sizes

for each of the 4 groups were: healthy ( $n = 150$ ), MDD-no dis ( $n = 21$ ), DIS-no mdd ( $n = 54$ ), and MDD/DIS ( $n = 54$ ).

## Procedure

Dyads participated in a 3- to 4-hour laboratory assessment, during which primary caregivers (94% mothers) were interviewed about their children's behaviors, emotions, and age-adjusted manifestations of psychiatric symptoms using the Preschool Age Psychiatric Assessment (PAPA).<sup>8</sup> The PAPA is an interviewer-based research diagnostic instrument for use in children 2 to 6 years of age that has been empirically validated and test re-test reliability has been previously established.<sup>9</sup> Trained interviewers administered the PAPA, which was audiotaped for later quality control.

Characteristics of preschoolers' tantrums (eg, intensity and frequency) were assessed by using the temper tantrum section of the PAPA. It is important to note that items from this section were not used in the DSM-IV algorithm to determine diagnostic status. Interviewers determined whether preschoolers' had exhibited  $\geq 1$  tantrums in the past 3 months. When tantrums had occurred in the last 3 months, interviewers determined the intensity level of the tantrum(s) by asking caregivers structured questions on the basis of a set of standard probes provided within the interview. When necessary, caregivers' responses were supplemented with unstructured follow-up questions by the interviewers to clarify participants' responses or elicit additional information about features of children's tantrums. Preschoolers were assigned to 1 of 3 possible tantrum intensity classifications. Classifications included: normative tantrums (tantrums that rarely escalate to excessive crying, shouting, and no destruction, violence, or both), excessive tantrums without aggression (tantrums that do not include aggression or violence but that included shouting, crying, and/or non directed flailing movements), or excessive tantrums with aggression (tantrums that in addition to crying and screaming include episodes of violence, aggression, or both toward objects, other people, or both). On the basis of the tantrum intensity level, interviewers proceeded to ask about the durational, frequency, contextual, behavioral, and recovery features of preschoolers' tantrums.

## RESULTS

Results from  $\chi^2$  and 1-way univariate analyses of variance (ANOVAs) indicated diagnostic groups differed significantly in age ( $F [3, 274] = 3.93, P < .05$ ) and family income ( $\chi^2 [9, n = 279] = 18.36, P < .05$ ). The MDD/DIS group was significantly older than the healthy and DIS-no mdd groups (Table I). The MDD/DIS group had significantly lower household incomes than the healthy ( $\chi^2 [3, n = 188] = 13.40, P < .01$ ) and MDD-no dis groups ( $\chi^2 [3, n = 68] = 8.13, P < .05$ ). No other differences were found.

### Temper Tantrum Intensity and Preschoolers' Diagnostic Classification

Results from a  $\chi^2$  indicated an overall significant difference ( $\chi^2 [6, n = 275] = 55.05, P < .001$ ) between tantrum

intensity and diagnostic group. Results from follow-up pairwise comparisons indicated that the MDD/DIS group was more likely to have engaged in excessive tantrums with aggression than the MDD-no dis (odds ratio [OR] = 9.77; 95% CI, 3.08-31.03;  $P < .001$ ) and healthy groups (OR = 9.21; 95% CI, 4.32-19.38;  $P < .001$ ). Similarly, the DIS-no mdd group was more likely to have engaged in excessive tantrums with aggression than the MDD-no dis (OR = 5.78; 95% CI, 1.89-17.61,  $P < .01$ ) and healthy groups (OR = 5.14; 95% CI, 2.73-10.73,  $P < .001$ ). No other significant differences were found.

For the next analyses, the 2 non-aggressive tantrum intensity levels (ie, normative tantrums and excessive tantrums without aggression) were combined to create a dichotomous tantrum variable (ie, "non-aggressive tantrums" or "excessive tantrums with aggression"). Results indicated significant ( $\chi^2 (3, n = 275) = 54.16, P < .001$ ) diagnostic group differences between the proportions of preschoolers who engaged in non-aggressive tantrums and preschoolers who engaged in aggressive tantrums. The MDD/DIS group was 9 times (95% CI, 3.08-31.03;  $P < .001$ ) more likely than the healthy and MDD-no dis groups to have displayed tantrums with violent aggression, destructive aggression, or both. Preschoolers in the DIS-no mdd group were 5 times (95% CI, 1.79-16.47;  $P < .01$ ) more likely than preschoolers in the healthy and MDD-no dis groups to have displayed tantrums with violent/destructive aggression. No other differences were found.

### Behavioral Characteristics of Preschoolers' Temper Tantrums

The dimensionality of 14 common tantrum behaviors was analyzed by conducting an exploratory factor analysis with an oblique (promax) rotation. The factor loadings are shown in Table II. Results from the exploratory factor analysis were used to create the 4 tantrum behavior scores, which comprised behaviors that significantly loaded onto each factor (Table II). Results indicated no effect of age or sex on the tantrum factor scores.

Results indicated that the DIS-no mdd group versus healthy ( $t = -6.93, P < .001$ ) and MDD/DIS ( $t = -6.07, P < .001$ ) groups had significantly higher destructive scores (Table III). The MDD-no dis versus healthy ( $t = -2.19, P < .05$ ) and MDD/DIS versus healthy ( $t = -5.28, P < .001$ ) groups had significantly higher self-injurious behaviors scores. The MDD-no dis versus the DIS-no mdd ( $t = 2.43, P < .01$ ) and MDD/DIS versus the DIS-no mdd ( $t = 3.07, P < .01$ ) groups had significantly higher self-injurious tantrum behavior scores. The DIS-no mdd versus healthy ( $t = 2.85, P < .01$ ), MDD/DIS versus healthy ( $t = 3.35, P < .001$ ), and MDD-no dis versus healthy ( $t = 4.70, P < .001$ ) groups had significantly higher non-destructive tantrum scores. Similarly, the DIS-no mdd versus healthy ( $t = 2.03, P < .05$ ) and MDD/DIS versus healthy ( $t = 3.11, P < .01$ ) groups had significantly higher oral aggressive tantrum behavior scores.

**Table II. Results from an oblique factor analysis examining tantrum behaviors**

	Aggressive destructive	Self-injurious	Non-destructive aggression	Oral aggression
Kicking others	.810			
Hitting others	.755			
Throwing objects	.697			
Breaking objects	.503			
Hitting self		.805		
Head banging		.628		
Holding breath		.623		
Biting self		.534		
Non-directed kicking			.690	
Stamping feet			.670	
Hitting wall			.615	
Biting others				.789
Spitting on others				.503

**Table III. Means and SDs for tantrum behaviors in diagnostic groups**

	Healthy (n = 150)	MDD-no dis (n = 21)	DIS-no mdd (n = 54)	MDD/DIS (n = 54)
Tantrum Frequency Mean (SD)				
Home	20 (56)	12 (22)	49 (51)	40 (75)
Daycare/School	.91 (4)	.86 (1)	15 (47)	4 (10)
Outside of home/school	2 (5)	2 (2)	19 (34)	15 (64)
Tantrum Duration Mean (SD)				
Duration in minutes and seconds	11:48 (12:16)	15:38 (10:17)	14:35 (12:40)	20:30 (19:27)
Tantrum Behaviors Mean (SD)				
Aggression/violence (4 behaviors possible)	1.32 (1.16)	2.00 (1.44)	2.72 (1.16)	2.88 (1.12)
Self-injurious (4 behaviors possible)	.16 (.44)	1.00 (1.16)	.28 (.68)	.96 (1.04)
Non-aggressive (3 behaviors possible)	1.38 (1.05)	2.07 (.60)	1.89 (.93)	2.10 (1.02)
Oral aggression (2 behaviors possible)	.24 (.54)	.54 (.68)	.56 (.70)	.70 (.80)

### Durational Features of Preschoolers' Temper Tantrum

Results from an ANOVA indicated a significant main effect of diagnostic group ( $F [3, 194] = 3.88, P < .05$ ) on total tantrum duration. Post hoc analyses revealed the MDD/DIS group had significantly longer tantrum durations than those in the healthy ( $t = 3.23, P < .01$ ) and DIS-no mdd groups ( $t = 1.76, P < .05$ ; Table III). No other significant differences were found.

### Frequencies of Preschoolers' Temper Tantrums in Three Different Domains

Results from a Kruskal-Wallis nonparametric ANOVA indicated a significant effect of diagnostic group status on tantrum frequency at home ( $\chi^2 [3, n = 201] = 36.75, P < .001$ ), school ( $\chi^2 [3, n = 168] = 10.87, P < .01$ ), and outside of home ( $\chi^2 [3, n = 181] = 32.19, P < .001$ ). Results from Mann-Whitney  $U$  tests indicated that the MDD/DIS group displayed significantly more tantrums within the home compared with the healthy ( $z = 3.27, P < .001$ ), DIS-no mdd ( $z = 1.94, P < .05$ ), and MDD-no dis ( $z = 2.19, P < .05$ ) groups. The DIS-no mdd group displayed significantly more tantrums within the home compared with the MDD-no dis ( $z = 3.36, P < .001$ ) and healthy ( $z = 5.61, P < .001$ ) groups. Within the school domain, the MDD-no dis ( $z = 1.98, P < .05$ ), DIS-no mdd ( $z = 3.06, P < .003$ ), and MDD/DIS ( $z = 2.24, P < .05$ ) groups had higher tantrum episode frequency scores than the healthy group. Preschoolers in the DIS-no mdd group displayed significantly ( $\chi^2 [3, n = 181] = 32.19, P < .001$ ) more tantrums outside of home/school than preschoolers in the MDD-no dis ( $z = 1.76, P < .05$ ), MDD/DIS ( $z = 2.24, P < .05$ ), and healthy ( $z = 5.43, P < .001$ ) groups. Preschoolers in the MDD/DIS group had significantly ( $z = 3.38, P < .001$ ) higher tantrum frequency scores outside of home than the healthy group.

.05) groups. The DIS-no mdd group displayed significantly more tantrums within the home compared with the MDD-no dis ( $z = 3.36, P < .001$ ) and healthy ( $z = 5.61, P < .001$ ) groups. Within the school domain, the MDD-no dis ( $z = 1.98, P < .05$ ), DIS-no mdd ( $z = 3.06, P < .003$ ), and MDD/DIS ( $z = 2.24, P < .05$ ) groups had higher tantrum episode frequency scores than the healthy group. Preschoolers in the DIS-no mdd group displayed significantly ( $\chi^2 [3, n = 181] = 32.19, P < .001$ ) more tantrums outside of home/school than preschoolers in the MDD-no dis ( $z = 1.76, P < .05$ ), MDD/DIS ( $z = 2.24, P < .05$ ), and healthy ( $z = 5.43, P < .001$ ) groups. Preschoolers in the MDD/DIS group had significantly ( $z = 3.38, P < .001$ ) higher tantrum frequency scores outside of home than the healthy group.

### Tantrum Recovery

Results from a  $\chi^2$  test indicated a significant ( $\chi^2 [2, n = 151] = 6.12, P < .05$ ) difference between diagnostic classification and preschoolers' recovery. ORs indicated that preschoolers in the MDD/DIS group were 6 times (95% CI, 2.19-13.95;  $P < .05$ ) more likely to be reported by caregivers

as having difficulty recovering from tantrums compared to children in the healthy group. No other diagnostic group differences were found.

## DISCUSSION

The behavioral characteristics of preschoolers' tantrums differed in relation to diagnostic group classification. Healthy children were reported to show significantly fewer violent, self-injurious, destructive, and orally aggressive tantrum behaviors than children with mood disorders, disruptive disorders, or both. Furthermore, healthy preschoolers had less severe and shorter tantrums and required less recovery time compared with children with DSM-IV diagnoses. Although replication of these findings is needed, results indicated that the "anatomy" of a tantrum in healthy preschoolers was significantly different from same age peers with mood disorders, disruptive disorders or both.

Despite these robust findings, they do not suggest that a single or group of behaviors during a tantrum episode could definitively indicate whether a child had or was at-risk for a psychiatric disorder. In several behavioral domains, as many as 30% of preschoolers in the healthy group displayed the same maladaptive behaviors as preschoolers with a psychiatric disorder, indicating that it was not uncommon even for healthy preschoolers to periodically display excessive or maladaptive tantrum behaviors. These findings underscore the notion that consideration for individual differences in emotion development and the enduring features of tantrum behaviors is of paramount importance. On the basis of these findings, the assessment of preschoolers' "tantrum style" is key to the determination of common/typical versus atypical tantrum behaviors that warrant a mental health evaluation.

Our results suggest there are 5 high risk "tantrum styles." These styles and suggested cutoffs were based on several quantitative characteristics of tantrum behaviors that most powerfully differentiated preschoolers in the healthy group from those in DSM-IV diagnostic groups. It is important to note that the clinical application of these tantrum styles and cutoffs as markers of early onset disorders has not been empirically established.

The 5 tantrum styles are: First, preschoolers' consistent (ie, >50% of the time during the last 10-20 tantrum episodes) display of aggression directed at caregivers, violently destructive behavior toward object, or both may indicate a clinical problem. Second, when preschoolers intentionally engage in self-injurious behavior during tantrums, regardless of tantrum frequency, duration, intensity, or context, this behavior should be considered very serious. Self-injurious behaviors during tantrums were rarely reported in preschoolers with the exception of those in the MDD groups. Third, preschoolers who display 10 to 20 discrete tantrum episodes on separate days at home, during a 30-day period, or on average who have more than 5 tantrums a day on multiple days while at school or outside of home/school are at greater risk of having a serious clinical problem. Fourth, extended tantrum duration, lasting >25 minutes on average, may indicate problems that are more

serious. Finally, preschoolers who are typically unable to calm themselves (ie, frequently require external assistance from a caregiver), regardless of tantrum intensity, frequency, or context, are at a much greater risk of having a clinical problem. On the basis of these findings, we propose that preschoolers who consistently exhibit the behaviors outlined may be in need of a referral to a mental health clinician for further evaluation. However, it is important to note that certain tantrum behaviors, such as a sudden onset of tantrums because of hunger, sleep problems, or illness, should not be considered alarming.

The second finding of interest was differences in tantrum behaviors between depressed and disruptive diagnostic groups. Consistent with the core characteristics of depression known in adolescents and adults, preschoolers with MDD displayed more internally directed anger (ie, self-injurious) than preschoolers in the healthy and DIS-no mdd groups. Depressed preschoolers regardless of comorbidity were significantly more likely to have engaged in self-injurious tantrum behaviors compared with preschoolers in all other groups. Although such behaviors are well known in older samples, this finding was particularly notable in young children. Conversely and less surprising was that DIS-no mdd preschoolers displayed more aggression toward other people, more tantrum behaviors out of home and school, and a poorer capacity to recover from tantrums compared with the MDD-no dis group, the healthy group, or both.

Limitations of this study include relying solely on parent-report to characterize preschoolers' tantrums. A related concern is that both the diagnostic and tantrum data were derived from the same informant. This study would have been strengthened by the inclusion of data about preschoolers' tantrums from teachers, babysitters, or family friends. Furthermore, the inclusion of observational data examining preschoolers' actual tantrum behaviors would have contributed additional support to these findings. Therefore, an important next step for future research is to include multi-informant methods when examining preschoolers' tantrums. An additional recommendation for future research would be to examine the relation among tantrum behaviors, parenting practices, and children's developmental and cognitive capacities.

An additional and complicated issue that arose in this study was whether it is accurate to equate the tantrums observed in "mentally healthy" children to normative/typical tantrums. Conceptually, children could easily be free of a psychiatric disorder but because of sensory integration dysfunction, preclinical cognitive and/or neurological conditions could be prone to severe types of temper tantrums. In addition, age-related differences should also be considered; that is, which developmental differences should be considered appropriate when comparing the tantrums of 3-versus 5-year-old children. In contrast to earlier studies conducted by Potegal and colleagues,<sup>10</sup> these results suggested no significant age differences in children's tantrums styles. One explanation for these differing findings is that earlier studies have included very young children (eg, 1-year-old). That is, the age differ-

ence may be caused by the inclusion of very young children compared with the more narrow age range of preschool age children used in this study. An important next step in temper tantrum research is to develop an operational definition of a “normal temper tantrum” that takes into account sensory issues, age, and mental status.

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