Loss of Temper and Irritability: The Relationship to Tantrums in a Community and Clinical Sample

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Abstract

Background: This study explores the relationship of irritability to tantrums and loss of temper in a community and clinical sample.

Methods: The community sample, recruited via commercial mailing lists, consisted of 462 6-year-olds whose parents completed the Child Behavior Checklist (CBCL), and Preschool Age Psychiatric Assessment (PAPA). Tantrums were assessed in the oppositional defiant disorder (ODD) section of the PAPA. Irritability was assessed in the depression section to identify persistently irritable and/or angry mood. The clinic sample, drawn from a child psychiatry clinic, included 229 consecutively referred 6-year-olds from 2005 through 2014 whose parents completed the CBCL and Child and Adolescent Symptom Inventory (CASI). Temper loss and irritability items came from the ODD and depression sections of the CASI, and tantrum description was taken from an irritability inventory. Children's Global Assessment Scale (CGAS) and the CBCL Dysregulation Profile were examined in both samples. Logistic and multiple regression were used to compare rates of diagnosis, CBCL subscales, CGAS, and tantrum quality between children with tantrums only and tantrums with irritability.

Results: Almost half (45.9%) of clinic children had severe tantrums; only 23.8% of those were said to be irritable. In the community, 11% of children had tantrums, but 78.4% of those were called irritable. However, irritability in the clinic, although less common, was associated with aggressive tantrums and substantial impairment. In contrast, irritability was associated with only a relatively small increase in impairment in the community sample.

Conclusions: Irritability may have different implications in community versus clinic samples, and tantrums assessed in the community may be qualitatively different from those seen in clinics.

Introduction

IN SPITE OF A LARGE CLINICAL AND DEVELOPMENTAL LITERATURE on reactive aggression (e.g., Tremblay et al. 2005), there remains a paucity of literature on actual tantrums or rage outbursts especially in school-aged children. This is surprising, as it is one of the primary reasons parents seek psychiatric help. For example, in one outpatient sample of 911 youth 5–17 years old, 12.6% of both parents and teachers, 24% of parents, and 9.5% of teachers described rage outbursts (Carlson and Dyson 2012) or tantrums in preschool children (eg, Potegal, Kosorek, Davidson 2003; Wakschlag et al, 2012). On an inpatient unit for 5–12-year-olds, 54.6% of children were psychiatrically hospitalized because of rages (Carlson et al. 2009).

Once considered reactive aggression, there has been a conceptual shift in recent years to understanding rage outbursts as part of a specific mood problem known as irritability (Stringaris et al. 2009,

2012b; Leibenluft and Stoddard 2013). Leibenluft et al. (2003 p. 207) suggested two different definitions for irritability. One “centers on the magnitude of the stimulus needed to elicit the angry response.” This is reactivity, or how quickly someone loses his or her temper. The second definition addresses the behavioral response, stating that “the more extreme forms of irritability are associated with responses that are of higher amplitude and longer duration than those of a child's unaffected peers.” If the former definition ascertains how short the fuse is, the anger and resulting reactive aggression describes the subsequent explosion.

Terms for the behavior or anger-induced aggression vary and include tantrums, rages, anger outbursts, explosive outbursts, meltdowns, and a number of terms parents use (e.g., “hissy fits,” “blowups,” or “fire-works”). There is no consistent term for such behavior in the literature, which makes it difficult to study. In fact, MEDLINE® searches produce quite different results depending upon which definition is searched.

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Studies of irritability that use semistructured interviews explore the mood component in the depression section. Severity is ascertained by the frequency with which irritability occurs, but confounds the mood with the behavior. For example, in the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Aged Children—Present and Lifetime Version (KSADS-PL) (2009 modification), the threshold score is “feeling irritable 50% of the time” or “often shouts or loses temper.” In the Washington University in St. Louis (WASH U) KSADS (Geller et al 2002), the most severe ratings are “most of the time angry or very angry or frequent uncontrollable tantrums.” The severe mood dysregulation module of the KSADS-PL (Leibenluft 2011) is designed to study irritable mood, and it is concerned with the mood’s chronicity and whether others notice it. The Preschool Age Psychiatric Assessment (PAPA) (Egger and Angold 2004) addresses “increased ease of precipitation of externally directed anger” and asks if the child “has had more tantrums.” For each of these interviews, there is only one rating, so that mood and tantrums are measured simultaneously. Therefore, it is not possible to ascertain what the child does during a tantrum or outburst.

Mood reactivity is ascertained in the severe mood dysregulation module (Leibenluft 2011) added to the KSADS-PL (Kaufman et al. 1996) by asking about specific behaviors such as swearing, throwing or destroying things, or actually hurting someone. What is recorded is how often any of those behaviors occur, so that the severest rating is a “reaction out of proportion to the stressor,” with “verbal rages or aggression toward people or property” occurring three times a week. There are no data supporting the choice of this frequency threshold, with the threshold apparently chosen as incontrovertibly frequent enough.

Other interviews do not define reactivity as such, but the oppositional defiant disorder (ODD) items inquire about how easily angered or annoyed the child is, or how often the child loses his or her temper. Again, frequency is recorded, but no questions address the quality or severity of tantrums. Only the PAPA specifically asks about tantrums and measures whether they are nondestructive (actions against property) or destructive (against people or objects) as well as asking about frequency (see Table S1) (supplementary material is available in the online article at www.liebert.com/jcap).

The new *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed. (DSM-5) (American Psychiatric Association 2013) condition of disruptive mood dysregulation disorder (DMDD), although controversial (Parens et al. 2010), has resulted in an increased focus on both irritability (Stringaris et al. 2012a; Leibenluft and Stoddard 2013) and the outbursts themselves (Carlson et al. 2009). The defining feature of DMDD is frequently occurring verbal or physical outbursts greatly out of proportion to the precipitant, with mood between the outbursts being persistently irritable and angry and noticeable by others. Like its forbear, severe mood dysregulation (Leibenluft et al. 2003), DMDD’s definition implies that it is possible to have outbursts without an intervening negative mood. That is something one certainly hears from parents who say, “My child is perfectly happy so long as he gets his way.” This contrasts with a child who is constantly cranky and simmering, such that it does not take much for him or her to boil over.

To date, two community studies of DMDD separate tantrums from DMDD. Copeland and colleagues (2013) used data from the Duke Preschool Anxiety study to report that 80% of their preschool sample had “severe tantrums,” though <20% had them frequently. In Dougherty et al.’s (2014) 6-year-old sample, 47.7% of children had had tantrums in the previous 3 months, but <20% had them frequently. Neither study specified the overlap between tantrums

and negative mood. The final rates of DMDD in these studies were 2.8% and 8.2%, respectively, which suggests that DMDD does not describe the vast majority of children with severe tantrums with or without irritability.

Three clinical samples can also shed some light on the co-occurrence between tantrums and irritability. Margulies et al. (2012) found that 76.2% of inpatient children with severe outbursts were also rated by the staff as “irritable” during hospitalization. However, compiling all available information, DMDD was diagnosed in only 17.4% of these patients. In outpatient samples, the Longitudinal Assessment of Manic Symptoms study (LAMS) reported that 52% of their 6–12-year-old participants had “severe, recurrent tantrums,” and 35% were chronically irritable, although the DMDD phenotype was present in only 26% (Axelson et al. 2012). Finally, in a sample of 51 children with severe tantrums, Roy et al. (2013) reported that only 13 (25.5%) were described as having an irritable mood most of the day. Of those with tantrums and irritability, 21.6% had severe mood dysregulation. Taken together, these data suggest that not all children with severe tantrums are considered irritable, and that not all children with both tantrums and irritability will meet criteria for a DMDD diagnosis.

If semistructured interviews have been used to study irritability and tantrums diagnostically, the Child Behavior Checklist (CBCL) (Achenbach 1991) has been used most frequently to address mood dysregulation dimensionally. Elevated scores on the anxiety/depression, attention/hyperactivity and aggression subscales have been associated with conditions characterized by mood dysregulation (e.g., Volk and Todd, 2006; Holtmann et al. 2007; McGough et al. 2008; Ayer et al. 2009). *t* scores from the aforementioned scales are generally added together with a 180 cutoff for nonclinic samples (Meyer et al. 2009; Kim et al. 2012), which is equivalent to ~1 standard deviation from the mean. Higher cutoffs (sum ≥ 201), ~1.5 standard deviations from the mean, are used in clinic samples (Uchida et al. 2014; Brederman et al. 1995).

The present study takes advantage of a community and clinical sample from the same catchment area of Long Island, New York to explore the frequency of truly severe tantrums and differences between children who have these outbursts with and without irritability. The strength of knowledge gained from community samples about psychopathology stems, in part, from understanding psychiatric conditions without the bias created by help-seeking. On the other hand, although samples of families who seek clinical help are complicated by a number of biases, they are also the population whose psychopathology clinicians need to understand. When considering community and clinical samples, a primary question is how conclusions drawn from one population are applicable to the other. This side-by-side comparison can begin to address this question.

The initial goal of this study is to examine the similarities and differences in an understudied problem – children with severe outbursts or tantrums – in two different samples, in order to answer the following questions: 1) What is the frequency of children with severe tantrums with and without irritability in both the community and clinical samples? 2) Is there a difference in phenomenology, as determined by diagnosis, CBCL Dysregulation Profile, duration and severity of tantrums, and impairment between children who experience tantrums only (T/O) versus those whose tantrums occur in the background of chronic irritability? (T+I)? and 3) Are these findings similar in community and clinic samples?

We hypothesize that children with co-occurring severe tantrums and irritability will be more symptomatic and impaired relative to children with tantrums only in both samples, although the clinic

sample will be more impaired than the community sample. We further speculate that children presenting to the clinic are at the extreme end of the community sample distribution.

Methods

This study compares two samples of 6-year-old children, most of whom were from the North Shore of Long Island, New York. Access to both samples enabled us to explore community/clinical differences in the phenomenology of severe tantrums with and without irritability without encountering major cultural and socioeconomic differences.

Community sample

The Stony Brook Temperament Study is a longitudinal study drawn from a suburban sample recruited via commercial mailing lists (Dougherty et al. 2013). For this study, we used information from a demographic questionnaire and the CBCL (Achenbach and Rescorla 2001) completed by parents of 6-year-olds ($n=462$). Parents were also interviewed with the PAPA (Egger and Angold 2004) for diagnostic information. We were specifically interested in children's tantrums, which were assessed in the ODD section of the PAPA, and irritability, which was assessed in the depression section (Supplementary Table 1) (see online supplementary material at <http://www.liebertonline.com>).

When assessing outbursts in the PAPA, the initial question ascertains the frequency of temper loss followed by whether the lost temper resulted in a tantrum. Tantrums that occur are rated as verbal, nondestructive, and destructive. Taken together, these items identified whether discrete episodes of severe temper outbursts manifested at least three times per week (Dougherty et al., 2014). Chronically irritable or angry mood questions assessed whether the child was prone to feelings of anger, irritability, annoyance, or low frustration tolerance more days than not, with a frequency ≥ 45 times in the past 3 months.

Diagnostic interviews were conducted by an experienced M.A.-level psychologist. To assess interrater reliability, advanced clinical psychology graduate students trained on the PAPA rated audiotapes of 35 interviews, oversampling children with psychopathology. Kappas ranged from 0.64 for depression and attention-deficit/hyperactivity disorder (ADHD) to 1.00 for separation anxiety disorder (Bufford et al. 2012).

Clinic sample

Parents and teachers of children referred to the Stony Brook University School of Medicine's Division of Child and Adolescent Psychiatry Outpatient Department for evaluation complete a variety of rating scales documenting the kinds of problems their child was having and the severity with which the problem occurred. This was done prior to their being interviewed. For this study, we report on findings from the CBCL (Achenbach and Rescorla 2001) and the Child and Adolescent Symptom Inventory (CASI) (Sprafkin et al. 2002). Parents were also asked to complete the Irritability Inventory that described their child's temper outbursts (if these were a problem); it asks whether the outbursts are chronic, episodic, or infrequent but severe, and it also quantifies how often rages occur (i.e., daily, weekly, monthly), what precipitates them, how long they last, and what kinds of behaviors characterize them (see Supplementary Table 2) (see online supplementary material at <http://www.liebertonline.com>).

Lastly, best-estimate diagnoses were made based on diagnostic interviews of parent and child combined with teacher information (Leckman et al. 1982). Kappa values between the two child psychiatrists who conducted the majority of the evaluations ranged from 0.78 for depression to 1.0 for ADHD and bipolar disorder (Carlson and Blader 2011).

For the purpose of this study, and in an effort to parallel the community study, loss of temper was defined by parent ratings of "often or very often" on the CASI item "often loses temper" from the ODD section; irritability was defined as "often or very often" on the CASI item "is irritable most of the day" from the depression section; the presence of actual tantrums was taken from the irritability inventory. Outbursts were defined as at least weekly.

Initial examination of rates of irritable mood revealed 42 (9%) children in the community sample and none in the clinic sample had irritability alone (i.e., without tantrums). Therefore, within each sample, we compared irritable children with tantrums (T+I) with children having tantrums only (T/O) on the following variables: 1) Demographics (e.g., child age, ethnicity, family composition, and parental education); 2) symptom scores via the CBCL using both continuous factor scores and cutoff scores ($T \geq 60$); 3) the CBCL-Dysregulation Profile (summed T scores on anxious/depression, attention problems, and aggression for community ≥ 180 and clinic ≥ 201 samples); 4) rates of diagnosis; 5) impairment via the Children's Global Assessment Scale (CGAS) (Shaffer et al. 1983); and 6) the quality of tantrums (e.g., length of tantrum > 30 minutes, and whether tantrums were destructive with aggression aimed at self or others, or nondestructive and aimed at property).

The main analyses consisted of comparing children with T+I and children with T/O within the community and clinic samples separately. For continuous variables (i.e., CBCL dysregulation subscale scores, CGAS), multiple regression analysis was used to examine the unique prediction of tantrum grouping on the dependent variable. Alternatively, for categorical variables (i.e., CBCL-Dysregulation Profile with cutoff scores, diagnoses, tantrum duration), we used logistic regression. Because of the number of analyses undertaken, we only interpret findings of $p < 0.01$ to limit type II errors. Because of differing methods of data collection, comparisons between the community and clinic samples are qualitative, not quantitative and statistical.

Results

There were no significant differences on demographic variables between T/O and T+I within each sample. As can be seen in Table 1, compared to the community sample, the clinic sample was predominantly male, more often nonwhite, and did not live with both biological parents as often.

TABLE 1. DEMOGRAPHIC INFORMATION FOR COMMUNITY AND CLINIC SAMPLES

	Community sample $n = 462$	Clinic sample $n = 229$
Mean age (SD)	6.1 (.43)	6.3 (.43)
% Male	54.1	72.5
% White	94.4	73.8
% Living with both biological parents	94.2	67.7
% At least one parent college educated	68.6	67.5

Frequent loss of temper versus temper tantrums

Of the 462 6-year-old community children assessed, the parents of 92 (19.9%) reported that their child lost his or her temper at least three times a week. Fifty-one of these children (11.0% of the total sample) met criteria for having had a temper tantrum at least three times per week in the previous 3 months, and these were the children on whom we report in the subsequent analyses. Forty children (8.7% of the whole sample) had T+I (see Fig. 1). There were no differences demographically, in rates of irritability, or in diagnoses between children in the community sample who “lost their tempers” and those who had actual temper tantrums. However, the 51 children who met criteria for temper tantrums, the focus of the study, had significantly higher mean CBCL aggression scores (mean=9.0, SD=5.9 vs. mean=5.2, SD=4.1; $t[81]=-3.78, p=0.002$) and CBCL Dysregulation Profile raw scores (mean=16.8, SD=11.3 vs. mean=10.7, SD=8.3; $t[81]=-2.67, p=0.009$), and significantly lower scores on the CGAS (mean=62.8, SD=10 vs. mean=68.1, SD=10.2; $t[90]=2.5, p=0.01$) compared with children who frequently lost their tempers but did not have tantrums.

The clinic sample was composed of 229 6-year-old children whose parents had completed rating scales between 2005 and 2014; 164 (85.4%) appeared for diagnostic assessment. Data were missing equally from T/O and T+I groups. One hundred and fourteen parents stated that their child “often/very often” lost his or her

temper and most of these ($n=105$) had actual tantrums as well. Twenty-five of children with tantrums (10.9% of the whole sample) had co-occurring irritability (T+I), whereas 80 (34.9% of the whole sample) had T/O (Fig. 1). Again, there were no differences demographically, in rates of irritability, or in diagnoses between children who lost their tempers and those who had temper tantrums.

Not surprisingly, more children in the clinic sample (45.9%) than the community sample (11.0%) had tantrums. However, among children with tantrums, irritability accompanied tantrum behavior much more often in the community sample (78.4%) than in the clinic sample (23.8%; see Table 2).

Tantrum differences within each sample

Community sample. Qualitatively, community children whose parents categorized them as T+I almost always had more severe ratings on clinical measures than T/O children, although differences were rarely significant.

There were no statistically significant differences between the two groups on the CBCL measures dimensionally. The CBCL T score equivalents of the tantrum sample was 55–60 (not clinical) on all three subscales that define the CBCL Dysregulation Profile (i.e., anxiety/depression, attention problems, and aggression), and there were no differences in rates of moderate (sum ≥ 180) or severe (sum ≥ 201) scores (see Table 2).

In the full sample of community children, 8.2% of children met criteria for DMDD and 50% in the co-occurring irritability and tantrum group met criteria for a DMDD diagnosis on the PAPA. Children with T/O were ineligible for the DMDD diagnoses, because they are not irritable by definition. Based on parental report, 47.5% of T+I children had noncomorbid ODD versus 9.1% of children with T/O, although this was not a significant difference. Because there were very few 6-year-old community children with ADHD, only 10% of T+I and 9.1% of T/O children had combined ADHD and ODD, and one child with tantrums had only ADHD. The remainder of the T+I community children had anxiety or depression (Table 2).

Regarding *tantrum quality*, approximately one third of children with tantrums had them for >15 minutes on average, although very few children had tantrums lasting >30 minutes (0% in the T/O group; 11% in the T+I group). The majority of children with tantrums expressed their anger verbally, rather than physically, though 36.6% of T+I children destroyed property, compared with 27.3% of T/O children. This was not a significant difference. None of the community children attacked others or hurt themselves during a tantrum. Finally, there was no significant correlation between tantrum severity and duration of tantrum, or between tantrum type and the CBCL Dysregulation Profile.

On the CGAS, T+I children were slightly, albeit not significantly, more impaired than T/O children. When the CGAS scores were correlated with CBCL subscales, however, data suggested that aggression was most strongly related to impairment, relative to anxiety/depression and attention problems ($r=-0.52$ for aggression; -0.45 for attention/hyperactivity; -0.37 for anxiety/depression).

Clinic sample. T+I children were significantly more symptomatic and impaired than T/O children across many domains in the clinic sample.

Raw scores for CBCL subscales are provided in Table 3, and demonstrate statistically significant differences between T+I children and T/O children. The T score equivalents of specific subscales further demonstrate that T+I children had more severe impairment

FIG. 1. Relationship among losing temper, tantrums, and irritability in community and clinic 6-year-olds.

TABLE 2. COMPARISON OF TANTRUMS IN 6-YEAR-OLDS IN COMMUNITY AND CLINIC SAMPLES

	Community severe tantrums n = 51 (11.0%)		Sig.	Clinic severe tantrums n = 105 (45.9%)		Sig.
	Tantrum (T/O)	Tantrum + irritability (T+I)		Tantrum (T/O)	Tantrum + irritability (T+I)	
Sample size	n = 11 (21.5%)	n = 40 (78.4%)		n = 80 (76.2%)	n = 25 (23.8%)	
% of severe tantrums						
CBCL Depression/Anxiety Mean (SD)	3.0 (3.6)	3.7 (4.5)	ns	5.4 (4.7)	8.4 (5.6)	$t = -2.4/$ $df = 1/$ $p = 0.02$
CBCL Attention problems: Mean (SD)	2.8 (2.5)	4.5 (3.4)	ns	9.9 (3.7)	13.6 (4.5)	$t = -3.7/$ $df = 1/$ $p < 0.001$
CBCL Aggression: Mean (SD)	7.6 (7.2)	9.3 (5.7)	ns	16.0 (5.7)	23.8 (4.9)	$t = -5.6/$ $df = 1/$ $p < 0.001$
CBCL Dysregulation Profile sum score : Mean (SD)	13.3 (12.0)	17.5 (11.1)	ns	31.3 (11.0)	45.8 (4.2)	$t = -5.2/$ $df = 1/$ $p < 0.001$
% CBCL Dysregulation Profile T sum >201	11.1 (1)	10.3 (4)	ns	8.8 (7)	32.0 (8)	$\chi^2 = 7.3/$ $df = 1/$ $p < 0.01$
Sample size with diagnostic information	n = 11 100%	n = 40 100%		n = 67 83.8%	n = 22 88.0%	
% Depression diagnosis (n)	9.1 (1)	20.0 (8)	ns	7.5 (5)	9.1 (2)	ns
% Anxiety diagnosis (n)	36.4 (4)	25.0 (10)	ns	23.9 (16)	31.8 (7)	ns
Neither ADHD nor ODD (n)	72.7 (8)	42.5 (17)		4.5 (3)	0	
% ADHD only (n)	9.1 (1)	0	$t = 1.9/$ $df = 1/$ $p = 0.07$	14.9 (10)	4.5 (1)	
% ODD only (n)	9.1 (1)	47.5 (19)		6.0 (4)	9.1 (2)	ns
% ADHD + ODD diagnosis (n)	9.1 (1)	10.0 (4)		74.6 (50)	86.4 (19)	
CGAS Global Functioning mean (SD)	66.0 (9.6)	61.9 (10.0)	ns	41.8 (6.7)	39.5 (3.3)	ns

CBCL, Child Behavior Checklist; ADHD, attention-deficit/hyperactivity disorder; ODD, oppositional defiant disorder; CGAS, Children's Global Assessment Scale.

than the T/O group, although the differences for anxiety/depression scores between groups were smaller ($T = 64$ vs. $T = 63$ for anxiety/depression; $T = 74.4$ vs. $T = 65.0$ for attention problems; $T = 72.5$ vs. $T = 63.8$ for aggression, respectively). The CBCL Dysregulation Profile (≥ 201) was also observed more commonly in T+I children than in T/O children (32.0% vs. 8.8%, respectively, $p < 0.01$).

Regarding *best estimate clinical diagnoses*, DMDD was operationally defined as including irritable children with severe tantrums at least once per week, although 50% of clinic children with DMDD had rages with physical aggression daily. Irritability in more than one setting was confirmed by teacher ratings. Sixteen of 229 children met those criteria (7.0%) in the clinic sample. The remaining

TABLE 3. NATURE AND SEVERITY OF TANTRUMS

	Community				Clinic		
	Severe tantrums n= 51 (11.0%)				Severe tantrums n= 105 (45.9%)		
	Tantrum (T/O)	Tantrum + irritability (T+I)	Sig.	Tantrum (T/O)	Tantrum + irritability (T+I)	Sig.	
Sample size	n= 11	n= 40	Sig.	n= 80	n= 25	Sig.	
% Duration of tantrum ≥15 minutes (n)	36.4 (4)	32.5 (13)	ns	67.9 (53)	80.0 (20)	ns	
% Duration of tantrum ≥30 minutes (n)	0	12.5 (5)	ns	17.9 (14)	60.0 (15)	$\chi^2= 15.4/df= 1/p<0.001$	
% Type of tantrum (n)							
Tantrums not reported	0	0		0	0		
Verbal outbursts only	72.7 (8)	65.0 (26)	ns	10.0 (8)	0	$t=-2.5/df= 1/p= 0.01$	
Property destruction	27.3 (3)	35.0 (14)		22.5 (18)	8.0 (2)		
Physical aggression				67.5 (54)	92.0 (23)		

nine children with T+I had outbursts only at home, and did not meet the multiple settings criterion.

Using the best estimate diagnosis from parent, teacher, and child-reported information, rates of depression and anxiety were low when examining both groups of clinic children. In contrast to the community children, most clinic children with ODD had comorbid ADHD (74.6% of the T/O group and 86.4% of T+I children). Very few had uncomplicated ADHD or ODD.

Regarding *tantrum quality*, the majority of 6-year-old clinic children with tantrums (73.3%) had outbursts in which they screamed, threatened and swore, and lashed out at property and others and sometimes themselves. Tantrums that included this type of physical aggression were significantly more common in T+I children (92%) than in T/O children (67.5%; see Table 3). In addition, in 60% of T+I children, the tantrums lasted >30 minutes. Duration and severity of tantrums were positively correlated with one another ($r=0.30$, $p<0.001$) and the CBCL Dysregulation subscales were positively correlated with both duration of tantrums ($r=0.22$, $p=0.008$) and severity of tantrums ($r=0.54$, $p<0.001$).

CGAS scores indicated severe but similar levels of impairment in both groups of children (see Table 2).

Discussion

The goals of the present study included examining the frequency of tantrums with and without irritability, and comparing children with co-occurring irritability and tantrums to children with pure tantrums on rates of the CBCL Dysregulation Profile, diagnosis, impairment, and tantrum quality, within a community and clinic sample. There are three main findings from this study. The first was unexpected; according to the results, “often losing temper” is not the same as having an actual tantrum, especially in the community sample. The second is that irritability in the community was fairly common in children who experienced temper tantrums; in contrast, only a minority of children with tantrums in the clinic sample exhibited chronic irritability, suggesting that irritability may mean something different in a community than in a clinical setting. Finally, at a descriptive level, the quality of tantrum behaviors in the two samples appeared to differ in both severity and kind.

The distinction between temper loss and tantrums varied between samples. We found that children in the community who lost their tempers at least three times a week comprised almost 20% of the sample, whereas actual temper tantrums only occurred in half of these children. The fact that the latter were more impaired and symptomatic suggests that outside of a clinic, frequency and severity of temper loss and actual tantrums, although clearly related, may be two different dimensions. It is not clear from other community studies whether that distinction was made. In the clinic sample, the distinction between temper loss and tantrums was less meaningful, as almost half the clinic sample (45.9%) had both frequent and severe tantrums. Relatedly, the type (or quality) of tantrum described by parents also differed across samples. Community sample 6-year-olds had briefer tantrums (<15 minutes), which were typically verbal. This stands in sharp contrast to the clinic sample, in which children had much longer tantrums (many at least 30 minutes) that were usually physical and directed toward others, not just property.

There were also differences in rates of co-occurring irritability and tantrums across samples. In contrast to the community sample, in which most children (78.4%) with tantrums were considered irritable by their parents, a similar percentage of clinic children (76.2%) were described as having explosive outbursts but *not* as

being irritable in between tantrums. In other words, parents of community children with tantrums were more than three times more likely to describe their children as irritable than parents of clinic children with tantrums, even though the latter were much more impaired. Moreover, although fewer parents of clinic-referred children described their children with tantrums as irritable, when parents did use that term, their children had two to three times the symptom severity on common measures (i.e., CBCL subscales of anxiety/depression, attention problems, and aggression, as well as the CBCL Dysregulation Profile) compared with children in the community who had co-occurring irritability and tantrums. To put it in relative terms, the 50th percentile score for the combined Dysregulation Profile subscales in the clinic sample was at the 96th percentile for severity in the community sample. Additionally, clinic children with tantrums generally functioned much more poorly (as measured by the CGAS) than children in the community with tantrums. That is, 7.6% of community children with tantrums scored ≤ 50 on the CGAS, whereas 92% of the clinic sample with tantrums scored ≤ 50 . These data suggest that the clinic sample is at the extreme end of the community sample distribution for mood dysregulation.

Although it is expected that psychiatrically referred children would have more significant temper outbursts relative to children in the community, the differing rates of irritability are harder to explain. We speculate that irritability has a different meaning for parents of clinic children than for those of community children. As we noted earlier, irritability may refer to the sensitivity of the child to a trigger (reactivity) *or* the magnitude of subsequent response (amplitude). Reactivity may apply more specifically to the community sample, whereas amplitude or severity of tantrums was what parents of the clinic sample rated. Notably, there were significant correlations in the clinic sample between dysregulated mood (which addresses dimensional irritability) and tantrum duration and severity. These associations were not observed in the community sample.

From our data, we conclude that tantrum severity is what leads to increased impairment especially in clinic groups. That may be surprising, because frequency (not severity) is most often measured in rating scales and interviews when temper loss and irritability are measured. Correlations from the CASI, which provides dimensions, and the Irritability Inventory, which quantifies tantrum severity by the number of aversive behaviors engaged in by the child when tantrumming reveals significant ($p<0.001$) but far from perfect correlations: Between irritability and losing temper ($r=0.55$), irritability and tantrum severity ($r=0.46$), and losing temper and tantrum severity ($r=0.65$). Our findings, therefore, illustrate the need to distinguish not only between how often children lose their temper but more specifically what the children do in the circumstances, and how long the outburst lasts.

The clinic study used the irritability item (never, sometimes, often, very often) from the depression section to explore that dimension. However, parents were asked specifically on the irritability inventory if their child was rarely irritable but with big explosions occasionally, whether anger occurred episodically, or whether the child had always been short-tempered and easily angered. There were significant differences between clinic groups on the basis of irritability, with 72% of the T+I group and 40% of the T/O group described as “always short tempered.” Nevertheless, almost half of the parents said that their child was irritable on one scale but not the other. This attests to variable parental responses depending upon how the question was asked and how the question was understood. We have reported elsewhere that it is more

difficult to obtain reliability on irritability ($\kappa=0.72$) than on subsequent explosive response ($\kappa=1.0$) even between professionals observing the child in the same setting (Margulies et al. 2012). These data suggest that in exploring the important concept of irritability, we may need to do more basic work in measurement of responses.

Between the two samples, diagnoses related to tantrums had similarities and differences. ODD was more often “pure” in the community sample, in which rates of ADHD are lower, and was usually complicated in the clinic sample, in which rates of ADHD are high. The comorbidity of ADHD and ODD is important because of its treatment implications. The current evidence-based approach for treating significant ADHD with affective aggression involves maximizing treatment for ADHD with medication and parent training and adding other antiaggressive or mood-stabilizing medication if the child has not sufficiently improved (Blader et al. 2009; Aman et al. 2014; Pliszka 2007). This is not the treatment for ODD alone.

Neither study used measures specifically designed to assess DMDD; therefore, the diagnosis was made by algorithm. Nevertheless, rates of DMDD in each population were almost identical. In the community sample, the DMDD rate of 8.2% has been published previously (Dougherty et al. 2014), and is very similar to the 7.0% rate of DMDD in the overall clinic sample. The criteria selected very different children, however. Sixty percent of community children with DMDD had only verbal tantrums, and the remaining 40% had “destructive” tantrums that primarily involved property damage. In contrast, virtually all the clinic children had verbal tantrums that were overshadowed by the fact that all but one child had attacked people during a rage (and the one exception aggressed against property). Although community children with DMDD functioned much more poorly than their peers (CGAS: mean = 64.6 [SD = 11.1] vs. mean = 76.3 [SD = 10.7]), these children functioned much better than their clinic counterparts with DMDD (CGAS: mean = 39.6 [SD = 2.3]). Similarly, only 5.4% of community children with DMDD evidenced the severe CBCL Dysregulation Profile phenotype, in contrast to 25% of clinic children with DMDD.

Besides the potentially different interpretation of irritability, another explanation for the counterintuitive findings of the lack of relationship between mood regulation/irritability and tantrum severity in the community children may relate to the age of the sample. Developmentally, emotion regulation improves with age (Rothbart et al. 2014), and current data from DMDD studies (Copeland et al. 2013) and studies of affective aggression (Hill et al. 2006) demonstrate a considerable decrease in rates of both over the course of early childhood and into adolescence. It may be that the 8.6% of the community sample who were still experiencing tantrums and irritability were somewhat delayed in emotion regulation development (Röll et al. 2012), and experienced milder irritability and tantrums relative to clinic children. The irritable children in the community sample are more closely related to the “externalizing/emotionally reactive” profile, which describes 7.3% of a large population-based sample of Dutch children (Basten et al. 2013), whose CBCL subscale scores of emotional reactivity, anxiety/depression and aggression are similar to those of the community sample. This is in contrast to the “highly problematic” 1.8% of the Dutch sample whose T scores were in the clinical range, and perhaps more similar to clinic children.

This study was undertaken in part to ascertain the frequency and kind of severe tantrums that present in community and clinic samples, as well as to explore the contribution made by irritability.

Unfortunately, differences in methodology across samples preclude formal comparisons of frequency and type of tantrums, irritability, and temper loss across settings. As noted earlier, irritability was ascertained by interview in the community and by rating scale in the clinic. Perhaps with the interview measure, interviewers ascertained the “easily annoyed” aspect of irritability, which had less of a relationship with tantrum severity, again illustrating the different aspects of irritability.

Diagnoses were also made differently in the two studies. In the community study, a diagnostic algorithm was followed as part of the PAPA’s caregiver-based information. In the clinic group, best estimate diagnoses were made based on 3 hour individual and joint interviews with the parent, child, and both together, as well as informant- and self-reported rating scale information and psychoeducational testing. However, for consistency, we report clinic ADHD and ODD diagnoses based only on parent report. It is in the nature of clinics to have higher rates of psychopathology than exist in community samples. Therefore, it is unlikely that diagnostic approach differences accounted for the large sample differences in disorders.

Regarding other study limitations, our findings have limited generalizability based on the relatively small-sized community sample, which was largely white and middle class socioeconomically. Further, in addition to the methodological differences of sample acquisition, the other major limitation is that these are secondary analyses of data sets not designed primarily to answer the questions being asked.

Conclusions

In conclusion, we report on a community and clinical sample of 6-year-old children from the same catchment area, who had tantrums with or without co-occurring irritability. We expected T+I children to be the most symptomatic and impaired in both samples. This was clearly evident in the clinic sample. The community sample exhibited differences in the same direction; however, the effects were much weaker and few were statistically significant. On the other hand, in the community sample, irritability was more frequent but had fewer symptom implications and did not relate to severity of tantrums. Our data suggest that further information is needed about how the terms “irritability” and “often loses temper” are understood between different sources and in different types of samples, as the children they identify are quite different. Although frequency and severity of irritability, losing temper, and tantrums are related, they are different phenomena.

Clinical Significance

In children with problems encompassing loss of temper, it is wise to ascertain children’s specific behaviors rather than relying on terms like “irritability” to capture them. These data suggest that although the frequency, severity, and behaviors associated with irritability are correlated, impairment may be more contingent on what the child does when irritable, rather than how often that child feels irritable or loses his or her temper. Children are rarely taken to emergency rooms, hospitalized, or secluded in schools for cursing, even if that occurs three times a week. One explosion per week that requires classroom evacuation has more far-reaching consequences than a verbal outburst. Our current assessment methods do not allow for that distinction, and as a result, severely hamper our being able to identify and study one of the most severe problems in child and adolescent psychiatry.

Finally, diagnoses that occur in children with tantrums may depend upon the base rate of the disorders in the sample under

study. In clinics where high rates of ADHD and ODD are encountered, that combination commonly accounts for much of the diagnostic morbidity and needs to be treated. This may differ in clinics where other conditions predominate, such that it may not be possible to generalize from one setting to another.

Disclosures

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