

## Characteristics of Anxious and Depressed Youth Seen in Two Different Clinical Contexts

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**Abstract** Previous research has revealed that youth seen at community clinics present with a higher frequency of externalizing problems and are demographically different from youth seen at research clinics. This study extends findings on these discrepancies by examining differences between youth at research and community clinics meeting criteria for two different primary disorders (anxiety and depression). Consistent with prior research, community clinic youth reported lower incomes, were more ethnically diverse, and had higher rates of externalizing problems compared to research clinic youth, regardless of primary diagnosis. Findings are discussed in terms of enhancing dissemination of evidence-based treatments for internalizing disorders in community settings.

**Keywords** Anxiety · Depression · Community clinics · Research clinics · Youth

Clinical child and adolescent researchers have accumulated considerable evidence in support of the efficacy of treatments for childhood mental health problems tested in research settings for both internalizing (e.g., Chorpita and Southam-Gerow 2006; Weisz et al. 2006) and externalizing disorders (e.g., McMahon et al. 2006). Unfortunately, these treatments appear not to be the ones most often used in community mental health centers (e.g., Weiss et al. 2000; Weisz et al. 1992) or school-based programs (e.g., Burns and Hoagwood 2002; Kataoka et al. 2003), leading to the oft-discussed gap between science and practice (e.g., Hoagwood and Olin 2002; National Advisory Mental Health Council Workgroup 2001; Weisz et al. 1995).

One reason that many believe the gap between service and science persists is that there are differences between the settings from which research evidence comes and the community settings at which many families seek treatment (e.g., Hammen et al. 1999; Southam-Gerow et al. 2006a, b; Weisz et al. 2003). The research settings that serve as the basis for most of the extant evidence base typically treat a single problem area, like child anxiety, are usually university-based, and typically rely on referral via internet, other advertisements or newspaper articles, family-initiated contacts or professional recommendations. Such research settings often have some level of grant-support for research conducted. On the other hand, community-based mental health programs are typically located in mental health agencies or schools and rely on a different set of referral streams, including managed care or Medicaid sources, school personnel, and government agencies (e.g., social services, juvenile justice). Funding for these clinics also comes from multiple sources, although most funding comes from public sources (Mark et al. 2007). Given these differences, skepticism remains that samples from research settings are representative of samples that would be found

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in community service settings (e.g., Persons and Silbershatz 1998; Weisz 2000).

Researchers have offered an ecological model for considering the external validity of treatment research, suggesting that differences between children seen in research clinics and those seen in community-based clinics may differ across (at least) four levels: (a) client, (b) provider, (c) agency, and (d) system (see Chorpita et al. 2002; Schoenwald and Hoagwood 2001; Southam-Gerow et al. 2006a). Differences at the level of the client represent the most frequently nominated reason for concern about the applicability of evidence-based treatments (EBTs), perhaps because most research on predictors of treatment outcome have emphasized how client-level variables influence the effects of treatment (e.g., Berman et al. 2000; Rohde et al. 2004; Southam-Gerow et al. 2001). A common claim is that the problems experienced by youth and families seen in community settings are more numerous and more severe than those in the clinics from which most of the research evidence has come (e.g., Weisz et al. 1995). Another common assertion, recently backed by some data, is that the context (e.g., ethnicity, parental psychopathology, significant life events, family income) of the youth in research samples differs from that of youth in community samples (e.g., Hammen et al. 1999; Southam-Gerow et al. 2008). Differences on such variables are a concern because these variables appear to be associated with treatment outcome (e.g., Griffith et al. 1998; Siqueland et al. 2002).

Studies have begun to emerge that examine differences and similarities among youths presenting in different clinical contexts. Concerning youth with primary anxiety disorder diagnoses, data from two recent studies indicated that community clinic youth and research clinic youth were roughly equivalent in the number and severity of anxiety disorders and symptoms observed (Southam-Gerow et al. 2003, 2008). However, community clinic youth had much higher levels of externalizing behavior problems, with effect sizes as high as Cohen's  $d = 1.42$ . In addition, youth in community clinics were from families with lower household income, were more likely to come from single-parent households, and had higher levels of psychosocial stressors. These observed differences may impact the effects of intervention programs developed in research settings when transported to a community setting.

Three separate studies, using benchmarking strategies, have suggested similar findings for youths with depressive disorders (Shirk et al. 2009; Weersing et al. 2006; Weersing and Weisz 2002). For example, in all three studies, youths with depression from research samples had similar pretreatment levels of depression to those in other clinical contexts (e.g., school-based mental health, community mental health center). Differences were apparent as well. Regarding symptom and diagnostic differences, all

three of the studies reported evidence suggesting that externalizing comorbidity may be lower in the research samples, though it was not always possible to test for this difference statistically. Data also suggested that youth from research clinics were less ethnically diverse, though the finding was not consistent across all three studies (nor was it always statistically tested).

Although these studies on youth with depressive disorders reported similar findings to the studies on youth with anxiety disorders, there were limitations of these studies for the purpose of understanding context-related sample differences. For example, the community mental health sample in the Weersing and Weisz study was not limited to those with primary depressive disorders. Further, the Weersing et al. (2006) study's two different contexts were more similar than those found in the other two studies; for example, the two sites shared a similar referral pool and both were apparently located at the same university-based medical center. Finally, the Shirk et al. (2009) study compared youths from randomized clinical trials (RCTs) to youth in their school-based mental health study, a context that is different from a community mental health center.

In short, data from several studies suggest that there are similarities and differences between youths from different contexts (i.e., research vs. community clinics) with anxiety or depressive disorders. In the current study, we provide additional data, extending the extant literature in two ways. First, we tested for differences among youth with two different primary diagnoses: anxiety and depression. Although studies exist examining context-related similarities and differences for both problem areas, the current study was carefully designed such that: (a) all youth compared had a primary anxiety (or depression diagnosis) and (b) parallel data were collected in each study to permit statistical tests for all comparisons. Second, our study extends previous research by testing for differences in the largest sample to date. The present investigation involves two studies with more than 450 youth diagnosed with primary DSM-IV anxiety or depressive disorders.

As in past studies, we compared a sample from a research clinic to a sample from community mental health clinics. The *research clinic* sample was obtained from children and families seeking assessment and treatment services at a large, university-based research clinic in Boston, Massachusetts that specializes in the treatment of anxiety and depression, along with related conditions. The majority of patients referred to this site come from the Boston metropolitan area and surrounding suburban portions of eastern Massachusetts, although some families travel from locations in northern Rhode Island, southern New Hampshire, Maine and western Massachusetts to receive services at the clinic. Although several current and past randomized controlled trials of current treatments for

anxiety disorders in children and adults have been conducted at this clinic, it is a somewhat unique treatment research setting in that individuals with principal anxiety and depressive disorders are seen regardless of the availability of a current clinical trial or other research study, with payments based on a sliding scale fee structure. However, all patients at the research clinic are asked to provide consent to participate in research related to initial intake and diagnostic assessment information and often volunteer for other, non-treatment studies initiated by graduate students and faculty.

In contrast, children in the *community clinic* sample were participants in a large randomized controlled effectiveness trial in Los Angeles, California, the Youth Anxiety and Depression Study (YADS; Weisz et al. 2009). YADS represents one of the first studies seeking to test the effects of EBTs in community mental health clinics. Although these sites differed geographically, the rare availability of comparable respondent-based and interviewer-based interviews and ratings scales at both sites (e.g., Jensen and Weisz 2002) created a unique opportunity for further exploration of client-level similarities and differences at these clinics. Furthermore, participants at both the research and community clinics were generally seeking, or recruited for the purposes of receiving, an evidence-based treatment for anxiety or depression at each site.

We tested for similarities and differences across three domains: child symptoms, diagnoses, and sociodemographic characteristics. Consistent with past work, we hypothesized that the community clinic sample would be similar to the research clinic in terms of primary diagnosis (i.e., anxiety or depression) severity. However, we also hypothesized that the two samples would differ in terms of externalizing psychopathology (with the community clinic sample being more severe) and sociodemographic characteristics, with the community clinic sample being (a) poorer and (b) more ethnically diverse.

## Method

The present investigation involved two separate but related studies that both involved comparison of a “research clinic” sample and a “community clinic” sample. The first, the *anxiety study*, focused on youth with primary anxiety disorder diagnoses and the second, the *depression study*, focused on youth with primary depressive disorder diagnoses. We present information about the samples of the two studies separately later. We also note that the two samples were recruited *independently* of each other. However, recruitment and measurement procedures were similar for both *studies*. Thus, before presenting sample characteristics,

we present detailed recruitment procedures and a description of the measures used.

## Participant Recruitment Procedures

As mentioned above, *research clinic* participants (and their families) from both studies were drawn from a larger pool of consecutive referrals of children and families seeking mental health services (primarily EBTs, such as cognitive behavior therapy), including those not specifically targeted in this investigation, at a university-based research clinic in Boston, Massachusetts between 1998 and 2007. Children and adolescents are referred to this research clinic via a number of sources including other mental health centers, school officials, media advertisements, or (most often) through an internet search. Data were obtained from all youth who came to the research clinic for a diagnostic assessment, which is the first step to receiving additional research-based treatment services at this location, and provided both parental consent and youth assent to participate. Though the research clinic typically recruits children and adolescents with principal anxiety disorders, many of the youth seen at the center have principal or co-occurring depressive disorders. Thus, those youth meeting criteria for a primary DSM-IV anxiety disorder (i.e., generalized anxiety disorder, separation anxiety disorder, social anxiety disorder, specific phobia) were included in the anxiety study and those who met criteria for a primary depressive disorder (i.e., major depressive disorder, dysthymic disorder) were included in the depression study.

*Community clinic* participants were all research participants seen in a large clinical trial, YADS (Southam-Gerow et al. in press; Weisz et al. 2009), conducted at six different clinics in Los Angeles, CA. The clinics had catchment areas that encompassed most of the geographic, ethnic, and SES diversity of Los Angeles county and account for the majority of the clinic-based youth treatment in a large portion of the county. All clinics were contractors of Los Angeles County’s Department of Mental Health and provided low- or no-cost services to families with limited or no insurance. Based on an initial research assessment, youth who met DSM-IV criteria for a primary anxiety disorder (i.e., separation anxiety disorder, generalized anxiety disorder, social anxiety disorder, specific phobia, or panic disorder) were included in the anxiety trial and those who met criteria for a primary depressive disorder (i.e., major depressive disorder, dysthymic disorder, or minor depressive disorder) were included in the depression trial. Parents and youths in the study all provided functional impairment ratings for all positive diagnoses. In the case of comorbidity involving an anxiety *and* a depressive disorder, diagnosis, symptom, referral problem, and impairment data were discussed by project staff, senior clinic staff, and

the family; if it was agreed that one of the anxiety disorders constituted the family's treatment priority, the youth was invited to enroll in the anxiety trial. Alternatively, if it was determined that one of the depressive disorders was the treatment priority, the case was assigned to the depression trial (see Southam-Gerow et al. in press; Weisz et al. 2009). All participants in the YADS trial received an evidence-based treatment for anxiety or depression during the course of this trial.

#### Diagnostic Measures

##### *Anxiety Disorders Interview Schedule for the DSM-IV, Child and Parent Versions (ADIS-IV-C/P; Silverman and Albano 1997)*

The ADIS-IV-C/P is a structured diagnostic interview administered to parents and children/adolescents to assess for DSM-IV anxiety disorders, mood disorders, and childhood externalizing disorders. The ADIS-IV-C/P is the diagnostic instrument used at the research clinic and is administered by advanced clinical doctoral students who have met specific training criteria, including observations of ADIS-IV-C/P administration by a trained clinician. In addition, the trainee must agree with the trainer on clinical diagnoses and clinical severity ratings (CSR) on three out of five consecutive assessments. The ADIS-IV-C/P yields composite diagnostic information based on the clinician's interpretation of the parent and child interview taken together. The ADIS-IV-C/P has good inter-rater reliability ( $r = 0.98$  for the parent interview and  $r = 0.93$  for the child interview; Silverman and Nelles 1988) and good retest reliability (e.g.  $k = 0.67$  for the parent interview,  $k = 0.76$  for the child interview; Silverman and Eisen 1992; Silverman et al. 2001). Preliminary inter-rater reliability analyses from 61 subjects at the research clinic indicated good inter-rater agreement ( $r = 0.73$ ) regarding diagnostic impression (i.e., what was assigned as principal diagnosis).

##### *The Diagnostic Interview Schedule for Children, Child and Parent Versions (DISC; Shaffer et al. 1991)*

The DISC is a structured interview assessment administered to parents and children to assess for DSM-IV diagnostic categories. The DISC is the diagnostic instrument used at the community clinics and was designed for administration by non-clinicians after a minimal training period. Unlike the ADIS-IV-C/P, which yields primary and secondary diagnoses, the DISC does not provide for designation of a primary diagnosis. The DISC has shown fair to excellent test-retest reliability (e.g.  $k = 0.55$  to  $0.77$  for the child interview,  $k = 0.55$  to  $0.88$  for the parent interview; Schwab-Stone et al. 1993; Landis and Koch 1977).

To allow for a comparison between the DISC, which yields both parent-report and child-report diagnostic information, and the ADIS-IV-C/P, which yields parent-child composite diagnostic information, we created composite DISC diagnostic data using an OR rule for DISC diagnoses. Specifically, we combined child and parent reports in such a manner that if either informant reported that the child met criteria for a DSM-IV anxiety or depression diagnosis on the DISC, they were considered to have that disorder. We did not require both informants to agree on the presence or absence of the disorder as parent-child agreement about symptom presentation on structured diagnostic interviews is often poor (Grills and Ollendick 2002). Moreover, this method of handling diagnostic information across informants follows the procedure and diagnostic algorithm outlined by the developers of the DISC (Shaffer et al. 1999).

#### Symptom Measures

##### *Child Behavior Checklist (CBCL; Achenbach 1991; Achenbach and Rescorla 2001)*

The CBCL is a widely-used 118-item scale that assesses parents' view of an array of behavioral problems and social competencies in their children. Psychometric characteristics of the measure are strong. For the present study, we focused on the eight narrow-band scales (i.e. Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, Aggressive Behavior) to parallel the Southam-Gerow et al. (2003) study.

##### *Children's Depression Inventory (CDI; Kovacs 1992)*

The CDI is widely used 27-item measure that helps assess cognitive, affective and behavioral signs of childhood depression via self-report. Kovacs (1992) reported retest reliability coefficients ranging from 0.50 to 0.87, and Cronbach's  $\alpha$  ranging from 0.71 to 0.89. The CDI yields five subscales (negative mood, interpersonal difficulties, negative self-esteem, ineffectiveness, and anhedonia) as well as a total score. For this study, we looked at differences between the two sites for the CDI total score.

#### Sociodemographic Measure

In addition, demographic information used for our analyses (i.e. ethnicity, family income) was collected at both the research clinic (gathered as part of the ADIS-IV-C/P assessment and on a self-report form) and the community clinics (gathered via a self-report form). Preliminary examination of participants at the research clinic revealed no significant differences between the ethnicity or income

level of those that participated in a clinical trial at no cost and those that participated in non-protocol treatment for a sliding-scale fee. Therefore, data for all eligible research clinic participants were considered for subsequent analyses. Ethnicity data were available for 79.8% of participants at the research clinic and 63.2% of participants at the community clinics. Income data were available for 80.0% of participants at the research clinic and 86.8% of participants at the community clinics. We discuss how we handled missing data for analyses shortly.

#### Participants: Anxiety Study

The *research clinic* sample for the anxiety study was composed of 302 child and adolescent participants (54.6% female [ $N = 165$ ], mean age = 11.40 years,  $SD = 2.23$ ; range 8.0–17.0 years). Self-identified racial/ethnic composition of the *research clinic* sample was as follows: 92.5% Caucasian, 4.6% “Other,” 1.7% Hispanic/Latino, less than 1% African-American, and less than 1% Asian-American. The *community clinic* sample was composed of 51 child and adolescent participants (56.9% female [ $N = 29$ ], mean age = 11.00 years,  $SD = 2.16$ , range 8–16 years). Self-identified racial/ethnic composition of the *community clinic* sample was as follows: 38.2% Hispanic/Latino, 35.3% Caucasian, 14.7% African-American, and 11.8% “Other.” Neither gender nor age differences were statistically significant. Ethnic differences are discussed later.

#### Participants: Depression Study

The *research clinic* sample for the depression study was composed of 31 child and adolescent participants (45.2% female [ $N = 14$ ], mean age = 13.35 years,  $SD = 2.40$ ; range 9–17 years). Self-identified racial/ethnic composition of the *research clinic* sample was 100% Caucasian. The *community clinic* sample was composed of 78 child and adolescent participants (57.7% female [ $N = 45$ ], mean age = 11.85 years,  $SD = 2.24$ , range 8–16 years). Self-identified racial/ethnic composition of the *community clinic* sample was as follows: 33.3% Caucasian, 31.4% African-American, 25.5% Hispanic/Latino, and 9.8% “Other.” Gender differences were not statistically significant, but age differences were statistically significant,  $t(107) = 3.07$ ,  $P = 0.003$ , with the *research clinic* sample being older. Ethnic differences are discussed later.

#### Analytic Plan

The main aim of the two studies was to compare the research clinic sample to the community clinic sample across multiple variables. We planned to use independent sample  $t$ -tests and chi-square tests when testing for

differences across sociodemographic variables and child diagnostic/symptom measures. Given the fact that the two samples were drawn from different geographic areas within the United States, additional analyses were planned to control for those geographic differences when conducting analyses of the sociodemographic variables using US Census data. To test the hypothesis that the difference between the research clinic and public clinic samples were (or were not) different from the expected difference based on Census data on the populations, we adapted the  $z_{un}$  test for proportion differences for two independent samples. For our Census analyses, we used the Consolidated Metropolitan Statistical Area (CMSA) data from the 2000 Census for Boston, MA (i.e., Boston-Worcester-Lawrence, MA–NH–ME–CT) and Los Angeles, CA (i.e., Los Angeles-Riverside-Orange County; US Census Bureau 2010).<sup>1</sup>

## Results

### Anxiety Study

As noted above, a total of 353 participants were included in the anxiety sample. Because we were conducting a number of tests, we adjusted the alpha level using a modified Bonferroni correction described by Holm (1979) and recommended by Jaccard and Guilamo-Ramos (2002). For each of the three families of tests (demographic, diagnostic, and symptom), we employed a per-family error rate of 0.05, though the alpha level for each test differs based on the number of tests in the family. We clearly note the significance level used for each significant test reported.

### Missing Data

We checked for systematic patterns in our missing data by testing for differences on all clinical and demographic variables, comparing participants missing data to those not missing data. We preliminarily examined for site differences; that is, were data more likely to be missing from the research or community site. Regarding missing ethnicity data, we found that community clinic participants had more missing ethnicity data (31.4% vs. 20.5%); however, the difference was not statistically significant,  $\chi^2(1, N = 353) = 2.98$ ,  $P = 0.08$ . Furthermore, youth missing ethnicity data at each site, respectively, did not differ from those who did report ethnicity on all other available variables (all  $P$ s > 0.05). Concerning missing income data, we found that more research clinic versus community clinic participants had missing income data (19.2% vs. 7.8%),

<sup>1</sup> We used the same strategy for these analyses as Southam-Gerow et al. (2003).

a statistically significant difference,  $\chi^2(1, N = 353) = 3.89$ ,  $P = 0.049$ . However, youth missing income data did not differ from those who reported the data on available symptom measures (all  $P$ s < 0.05). Thus, although it appeared that families in the research clinic were more likely to have missing income data, the omission of those data were not systematically related to other available data.

### Comparability with Past Studies

Preliminarily, to place our samples in a broader context (i.e., to permit assessment of the samples' generalizability), we have followed work of others (e.g., Shirk et al. 2009; Weersing et al. 2006) and included a table displaying select demographic and clinical data for our anxiety and depression samples along with similar data from other samples of research and community clinics (see Table 1).

### Demographic Variables: Minority Status

We tested for differences on ethnicity and income level. For ethnicity, we collapsed categories in both samples such

that each participant was classified as a Minority or Non-Minority because there were so few minority participants in the research clinic sample that more detailed statistical comparisons were not practical.

Our main analysis showed that significantly more youth in the community clinics reported being in a minority group,  $\chi^2(1, N = 274) = 81.22$ ,  $P < 0.001$  (critical  $P = 0.05$ ). Nearly 66% of youth seen at the community clinics were members of an ethnic minority group compared to 7.5% of youth seen at the research clinic. Given that the research and community clinics were located in two geographically different areas, we compared the groups to the 2000 Census data (US Census Bureau 2010) to determine if differences in populations explained the sample differences. Census data indicates that the Boston CMSA was 82.5% non-minority whereas the Los Angeles CMSA was 48.7% non-minority (US Census Bureau 2010). Despite this already larger population, the difference we observed between the research and community clinics was significantly more pronounced,  $z_{un} = 2.32$ ,  $P = 0.01$  (critical  $P = 0.05$ ).

**Table 1** Characteristics of research and community clinic samples by study

	Pre-treatment z-score	Primary measure	Mean age	% Female	% Minority	% DBD
<b>Anxiety study</b>						
Research clinics						
Current study	1.72	CBCL-AD	11.4	54.6	7.5	10.0
Kendall and Sugarman (1997)	2.25	CBCL-AD	NR	38.0	15.0	9.0
Kendall et al. (2008)	1.79	CBCL-I	10.3	44.0	15.0	14.0
Silverman et al. (1999)	2.29	CBCL-I	9.89	39.2	53.6	NR
Community clinics						
Current study	1.67	CBCL-AD	11.0	56.9	64.7	31.4
Barrington et al. (2005)	1.41	BASC-A	10.0	64.8	NR	NR
Farrell et al. (2005)	0.14	SCAS	7.5	61.1	NR	0
<b>Depression study</b>						
Research clinics						
Current study	2.45	CBCL-AD	13.4	45.2	0.0	6.5
Brent et al. (1997)	2.28	BDI	15.6	76.0	16.7	20.7
TADS (2004)	3.57	CDRS-R	14.6	54.4	26.2	2.0
Vostanis et al. (1996)	2.06	MFQ-C	12.7	56.0	12.3	19.3
Weisz et al. (1997)	1.46	CDRS-R	9.6	45.8	37.5	NR
Community clinics						
Current study	1.79	CBCL-AD	11.9	57.7	66.7	63.6
Shirk et al. (2009)	3.24	BDI	15.9	68.0	46.0	32.0
Weersing et al. (2006) STAR	2.24	BDI	15.6	77.0	15.0	5.0

Note: Pre-treatment z-scores were either (a) calculated for this study or (b) based on the Shirk et al. (2009) study (see Table 1, p. 5)

CBCL-AD Child Behavior Checklist-Anxious/Depressed scale, CBCL-I Child Behavior Checklist-Internalizing scale, BASC-A Behavior Assessment System for Children-Anxiety scale, SCAS Spence Children's Anxiety Scale, BDI Beck Depression Inventory, CDRS-R Children's Depression Rating Scale-Revised, MFQ-C Mood and Feelings Questionnaire, % DBD % of youth in the sample meeting criteria for oppositional defiant or conduct disorder

### Demographic Variables: Income

Self-reported family income was reported using different groupings across the two samples (e.g., 0–\$10,000 vs. 0–\$15,000). However, we were able to categorize each sample into the same two groups: those earning \$60,000 or less and those earning more than \$60,000.

Our main analysis comparing the two samples on income revealed significant differences, with the research clinic serving significantly more families with annual incomes of more than \$60,000,  $\chi^2(1, N = 338) = 63.47$ ,  $P < 0.001$  (critical  $P = 0.05$ ). In the research clinic, 68.9% reported annual incomes of \$60,000 or above. In contrast, only 6.4% of families seen in the community clinics reported incomes above \$60,000, an almost 11-fold difference. Again, because of the geographic differences between the two samples, we compared these findings to what would be expected given population data from the 2000 Census (US Census Bureau 2010). Census data indicates that 46.3% of the population in the Boston CMSA reported incomes over \$60,000 compared to 35.0% of the Los Angeles CMSA. Despite the population difference, we found our observed difference was even more pronounced than would be expected given population differences,  $z_{\text{un}} = 9.52$ ,  $P < 0.001$  (critical  $P = 0.05$ ).

### Diagnostic Measures

We tested for differences between the samples with regard to comorbid non-anxiety disorder diagnoses for which data were available at both sites: major depressive disorder (MDD), dysthymic disorder (DD), attention deficit hyperactivity disorder (ADHD), and oppositional defiant disorder (ODD). The four chi-square analyses revealed one significant difference in diagnostic presentation between the two groups when applying the Holm procedure to correct for Type I error. Specifically, youth seen at the community clinics exhibited significantly higher rates of ODD (31.4% vs. 10.0%),  $\chi^2(1, N = 352) = 17.59$ ,  $P < 0.001$  (critical  $P = 0.0125$ ) than youth at the research clinic. The differences between the community and clinical samples on rates of ADHD (25.5% vs. 13.9%),  $\chi^2(1, N = 353) = 4.45$ , MDD (4.3% vs. 13.2%),  $\chi^2(1, N = 349) = 3.11$ , and DD (2.1% vs. 5%),  $\chi^2(1, N = 350) = 0.79$  all failed to achieve statistical significance (all  $P$ s  $>$  the critical  $P$  of 0.0167).

### Symptom Measures

We tested for differences on all eight narrow-band scales of the CBCL as well as the CDI total score. Results are reported in Table 2; scales with statistically significant differences are in *bold italics*. Using the Holm procedure to

establish critical  $P$ -values to protect against Type I error, we found that significant differences were in evidence for three of the CBCL scales. Specifically, parents of youth in the community clinics reported higher levels of delinquent and aggressive behaviors and attention problems in their children compared to parents in the research clinic. Effect size estimates for the differences were large for delinquent behavior and medium for aggressive behavior and attention problems. No significant differences emerged between the two groups for the five remaining CBCL scales (i.e., Withdrawn Behavior, Somatic Problems, Anxiety and Depression, Social Problems, or Thought Problems) or for the CDI.

As a follow-up analysis for the three scales for which significant differences were found, we used chi-square analyses to compare the number of youth who exceeded the clinical cut-off of 65 often used for the CBCL scales (cf. normative comparison, Kendall et al. 1999). We found that more youth in the community clinic sample had scores at or above 65 for two of the three scales: Attention Problems (52.9% vs. 26.5%),  $\chi^2(1, N = 353) = 14.45$ ,  $P < 0.001$  (critical  $P = 0.0167$ ) and Delinquent Behavior (29.4% vs. 7.0%),  $\chi^2(1, N = 353) = 24.029$ ,  $P < 0.001$  (critical  $P = 0.025$ ). Aggressive Behavior (29.4% vs. 23.2%),  $\chi^2(1, N = 353) = 0.927$ ,  $P = 0.346$  failed to achieve statistical significance.

### Depression Study

As noted, a total of 109 participants were included in the depression sample (31 research clinic; 78 community clinics). We employed the Holm procedure to minimize Type I error. Alpha levels for individual tests are provided when needed.

### Missing Data

We checked for systematic patterns in our missing data by testing for differences on all clinical and demographic variables, comparing participants missing data to those not missing data. We preliminarily examined for site differences; that is, were data more likely to be missing from the research or community site. Regarding missing ethnicity data, we found that community clinic participants had more missing ethnicity data (34.6% vs. 19.4%); however, the difference was not statistically significant,  $\chi^2(1, N = 109) = 2.45$ ,  $P = 0.12$ . Furthermore, youth missing ethnicity data at each site, respectively, did not differ from those who did report ethnicity on all other available variables (all  $P$ s  $>$  0.05). Concerning missing income data, we found that more research clinic versus community clinic participants had missing income data (9.7% vs. 9.0%), though the difference was not statistically significant

**Table 2** Symptom measure descriptive and test statistics by study and site

Anxiety study	Research clinic ( <i>n</i> = 302)		Community clinic ( <i>n</i> = 51)		<i>t</i>	df	<i>P</i> value	<i>d</i>
	Mean	SD	Mean	SD				
CDI total	9.13	7.21	7.55	6.74	1.46	351	0.1440	0.22
CBCL Withdrawn Behavior Scale	61.75	10.32	60.90	9.28	0.55	351	0.5830	0.08
CBCL Somatic Problems Scale	63.89	9.79	61.39	10.43	1.67	351	0.0960	0.25
CBCL Anxiety & Depression Scale	69.35	10.32	66.67	8.97	1.75	351	0.0810	0.26
CBCL Social Problems Scale	59.28	9.55	62.33	9.86	−2.10	351	0.0370	−0.32
<b>CBCL Attention Problems Scale</b>	59.54	9.03	65.27	9.78	−4.15	351	0.0009	−0.63
CBCL Thought Problems Scale	62.03	8.75	62.61	9.03	−0.43	351	0.6640	−0.07
<b>CBCL Delinquent Behavior Scale</b>	53.87	6.04	59.73	7.72	−6.13	351	0.0009	−0.93
<b>CBCL Aggressive Behavior Scale</b>	57.62	8.24	61.33	9.54	−2.91	351	0.0040	−0.44
Depression study	Research clinic ( <i>n</i> = 31)		Community clinic ( <i>n</i> = 78)		<i>t</i>	df	<i>P</i> value	<i>d</i>
	Mean	SD	Mean	SD				
<b>CDI total</b>	16.81	8.27	10.87	8.33	3.36	107	0.0010	0.71
CBCL Withdrawn Behavior Scale	69.68	12.00	68.00	9.34	0.78	107	0.4380	0.16
CBCL Somatic Problems Scale	66.23	11.70	64.21	9.15	0.96	107	0.3400	0.20
<b>CBCL Anxiety &amp; Depression Scale</b>	74.32	10.08	68.04	9.26	3.12	107	0.0020	0.65
CBCL Social Problems Scale	62.94	11.44	65.04	10.81	−0.90	107	0.3690	−0.19
CBCL Attention Problems Scale	65.10	7.66	69.50	9.45	−2.31	107	0.0230	−0.49
CBCL Thought Problems Scale	62.39	9.10	64.40	10.04	−0.97	107	0.3350	−0.20
<b>CBCL Delinquent Behavior Scale</b>	55.65	6.91	64.38	9.01	−4.86	107	0.0009	−1.02
CBCL Aggressive Behavior Scale	60.65	9.70	66.90	11.95	−2.59	107	0.0110	−0.55

CDI Children's Depression Inventory, CBCL Child Behavior Checklist

\* *P* < appropriate alpha-level, as per the Holm procedure, see text

different,  $\chi^2(1, N = 109) = 0.013, P = 0.909$ . Further, youth missing income data did not differ from those who reported the data on available symptom measures (all *P*s < 0.05). Overall, evidence suggested that the data were missing completely at random.

#### Comparability with Past Studies

Table 1 displays select demographic and clinical data for our anxiety and depression samples along with similar data from other samples of research and community clinics.

#### Demographic Variables: Minority Status

As in the Anxiety Study, we collapsed categories in both samples such that each participant was classified as a Minority or Non-Minority because there were so few minority participants in the research clinic sample.

For our primary analyses, we conducted chi-square analyses and found that there were significantly more minority youth receiving treatment at the community clinic than at the research clinic, (66% vs. 0%)

$\chi^2(1, N = 75) = 29.46, P < 0.001$  (critical *P* = 0.05). Because the research and service clinics are located in geographically different areas, there was a possibility that the two groups may have differed due to this geographic difference. We used 2000 Census data to determine if these differences were due to geographic differences alone. As described earlier, the Boston CMSA is 17.5% minority whereas the Los Angeles CMSA is 51.3% minority. Even controlling for this pronounced population difference, our observed differences remained significantly different ( $z_{\text{un}} = 2.26, P < 0.012$ ; critical *P* = 0.05).

#### Demographic Variables: Income

Families seen at the research clinic were significantly more likely to report annual family incomes higher than \$60,000 than those seen at the community clinic (64.3% vs. 7%),  $\chi^2(1, N = 99) = 36.895, P < 0.001$  (critical *P* = 0.05). We also examined 2000 Census data to determine whether the difference in annual income between the two sites was due to geographic differences alone. Earlier, we noted that Census data indicates that 46.3% of the population in the



Boston CMSA reported incomes over \$60,000 compared to 35.0% of the Los Angeles CMSA. Controlling for that difference, we still found that our observed income differences were significantly different ( $z_{un} = 6.10$ ,  $P < 0.001$ ; critical  $P = 0.05$ ).

### Diagnostic Measures

For the depression study, we tested for differences between the two samples on comorbid anxiety disorders (i.e., Separation Anxiety Disorder, Generalized Anxiety Disorder, Social Phobia, Obsessive Compulsive Disorder, and Post-Traumatic Disorder), ODD, and ADHD. Chi-square analyses revealed five significant differences in diagnostic presentation between the two groups. Specifically, the research clinic participants exhibited higher rates of three anxiety disorders: Social Phobia (64.5% vs. 12.8%),  $\chi^2(1, N = 109) = 29.72$ ,  $P < 0.0009$  (critical  $P = 0.007$ ), OCD (22.6% vs. 2.6%),  $\chi^2(1, N = 109) = 11.733$ ,  $P < 0.001$  (critical  $P = 0.01$ ), and GAD (41.9% vs. 15.4%),  $\chi^2(1, N = 109) = 8.848$ ,  $P < 0.003$  (critical  $P = 0.0125$ ). Youth seen at the community clinics, however, showed higher rates of the two externalizing disorders: ADHD (41.6% vs. 12.9%),  $\chi^2(1, N = 108) = 8.167$ ,  $P < 0.004$  (critical  $P = 0.017$ ) and ODD (63.6% vs. 6.5%),  $\chi^2(1, N = 108) = 29.00$ ,  $P < 0.0009$  (critical  $P = 0.008$ ).

### Symptom Measures

The two groups also differed somewhat on symptom presentation, as summarized in Table 2; scales with statistically significant differences are in *bold italics*. Specifically, clients seen at the research clinic had higher self-reported depressive symptoms (CDI) and higher parent-reported anxiety and depressive symptoms on the CBCL; effect sizes for both differences were in the medium to large range. In addition, parents of youth in the community clinics reported higher levels of delinquent behaviors; the effect size for this difference was large.

As a follow-up analysis for the two CBCL scales for which significant differences were found, we used chi-square analyses to compare the number of youth who exceeded the clinical cut-off of 65 often used for the CBCL (cf. normative comparison, Kendall et al. 1999). We found that more youth in the community clinic sample had scores at or above 65 for the Delinquent Problems scale (51.3% vs. 16.1%),  $\chi^2(1, N = 109) = 11.309$ ,  $P < 0.001$  (critical  $P = 0.025$ ) whereas there were no statistically significant differences between the samples with regard to youth exceeding the clinical cut-off on the CBCL Anxiety/Depression scale (77.4% research vs. 61.5% community),  $\chi^2(1, N = 109) = 2.495$ ,  $P = 0.114$  (critical  $P = 0.05$ ).

### Discussion

In two separate methodologically similar studies, we compared youth from research and community mental health clinics with primary anxiety (Anxiety Study) and depressive (Depression Study) disorder diagnoses across three domains of variables: (a) symptoms, (b) diagnoses and (c) sociodemographic characteristics. Overall, results supported findings from past work suggesting several differences between youth seen in research versus community clinics, with differences primarily related to externalizing symptoms and diagnoses and sociodemographic characteristics. Additionally, evidence from both studies suggested there were potentially relevant similarities between research and community clinics, replicating past work. The differences observed underscore the potential relevance for consideration of context in treatment development and adaptation, especially as the field moves toward dissemination of EBTs. Although the anxiety study is a replication of past work (i.e., Southam-Gerow et al. 2003, 2008), the depression study is the first study to our knowledge to compare youth with primary depressive disorders in different settings. We discuss specific findings before turning to clinical and research implications.

First, while salient differences emerged between groups, it is important to note that results from the symptom and diagnosis comparisons suggested that there were similarities. Rates of major depressive disorder, dysthymia, and ADHD in the anxiety study were not statistically different between the research and community clinic samples; similarly, rates of separation anxiety disorder and post-traumatic stress disorder in the depression study were not statistically different between the two samples. In addition, the majority of non-externalizing behavior rating scales on the CBCL emerged as having generally consistent values across both samples. Thus, some of the evidence from the present set of studies suggests that there are similarities between research and community clinic samples seeking treatment for anxiety and depression.

However, the patterns of differences between research and community clinics were striking. One particular pattern was that youth from community clinics were much more likely to report higher levels of symptoms and diagnoses consistent with externalizing behavior problems. As an example, rates of ODD were between 3 (Anxiety Study) and 9 (Depression Study) times higher for youth in the community clinics. Furthermore, parent reports of delinquent behaviors were much higher in the community clinics across both studies, with effect sizes exceeding 0.90, a “large” effect using Cohen’s standards and comparable to effects found in past work in this area (e.g., Southam-Gerow et al. 2003). Differences were also notable concerning attention problems, though the specifics varied across the two studies.

In the Anxiety Study, parents' reports of attention problems on the CBCL were higher for community clinic youth, with the effect size in the small to medium range. Further, in the Anxiety Study, more than half of the youth in the community clinic sample were in the clinical range ( $T$ -score  $> 65$ ) on the CBCL attention problems scale whereas only 26% of parents of youth in the research clinic reported similar levels of problems. In the Depression Study, although CBCL attention problem scale scores were not statistically significantly different (effect size was 0.20), the rate of ADHD diagnoses was more than three times as high in the community clinic sample. In short, the preponderance of evidence suggests that youth in the community clinics were experiencing significantly higher levels of externalizing behavior problems across several indices.

On the other hand, some of the differences that we found suggested that the research clinic youth were more severely impaired, though only in the Depression Study. Research clinic youth had higher self-reported symptoms of depression; the effect size was in the medium to large range (0.71). Further, youth in the research clinics were much more likely to have comorbid GAD, OCD, and social phobia. The finding was not noted for all anxiety disorders in the Depression Study (e.g., separation anxiety disorder and post-traumatic stress disorder) and must be qualified by two potentially confounding factors. First, the research clinic focused mainly on recruiting youth with primary anxiety disorders. Thus, it is possible that the clinic attracted youth with more anxiety disorders than a non-specialty clinic would. Second, the community clinics in the study were participating in two clinical trials—one for depression and one for anxiety. Thus, the community clinic samples in either of the two studies may have lower comorbidity levels for depression (in the Anxiety Study) or anxiety (in the Depression Study) because of trial recruitment.

The pattern of sociodemographic differences was consistent across studies. Youth from community clinics were much more likely to live in families with lower incomes and were more likely to be in an ethnic minority group. The magnitude of these differences was quite large. Youth in the research clinic were up to ten times as likely to have family incomes exceeding \$60,000. Similarly, youth in the community clinic samples in both studies were at least eight times as likely to come from an ethnic minority groups. Indeed, none of the research clinic youth in the depression study were from an ethnic minority group (compared to 66% in the community clinic sample).

In sum, our findings replicate and extend two basic findings: while some similarities exist, youth with primary anxiety or depressive disorders from community clinics appear to experience higher levels of externalizing comorbidity, are more likely to be ethnic minorities, and are more likely to live in homes with lower family incomes

compared to youths seen in research clinics as part of RCTs. So what might these differences mean? We now briefly discuss how the observed differences (clinical, sociodemographic) found in these two studies highlight challenges facing the field as we move toward widespread dissemination of EBTs.

Because community clinic youth with anxiety and depressive disorders appear to have higher levels of externalizing behavior problems, there may be some reason for caution in using treatment manuals with a single-disorder focus. Recent data examining EBTs performance for youths with multiple problems has been mixed. One study of youths with depression and conduct problems suggested that an EBT for adolescent depression worked well in reducing depression symptoms but did not have benefits for conduct symptoms (Rohde et al. 2004). Recent RCTs for youths with primary anxiety or depressive disorders have been positive insofar as EBTs have performed well, leading to symptom reduction. However, these studies have also found that the EBTs failed to outperform usual care (e.g., Barrington et al. 2005; Clarke et al. 2005; Southam-Gerow et al. in press; Weisz et al. 2009). Our results suggest a tentative but possible reason for these mixed results; the potency of EBTs may be limited by their focus on a single problem. If true, efforts to describe and test approaches to treatment that permit incorporation of multiple treatment foci should be encouraged. Work is already underway by several separate investigative teams (e.g., Chorpita et al. 2005; Southam-Gerow et al. 2009; Weiss et al. 2003; Ehrenreich et al. 2008; Trosper et al. 2009).

It is probably not surprising to learn that research clinics lack the ethnic diversity of community clinics; it is widely known that Caucasian families are over-represented in the evidence base (e.g., Huey and Polo 2008; Mak et al. 2007). Further, it is not particularly surprising that youth in research clinics come from families with higher incomes than youth in community clinics. Although the findings are not surprising, the sociodemographic differences evidenced in this and past studies raise a number of issues. First, family income and ethnicity have both been associated with premature termination of treatment or attenuation of treatment effects (e.g., Curry et al. 2006; Kazdin et al. 1992; Kendall and Sugarman 1997; Miller et al. 2008; Nock and Kazdin 2001) and with lower levels of client engagement in treatment (e.g., Griffith et al. 1998; Siqueland et al. 2002). Kazdin has suggested that what predicts early termination of treatment is not level of psychopathology but family ecology variables like income (e.g., Kazdin and Wassell 1999). Thus, on one level, these findings suggest the importance of developing, integrating, and testing engagement and participation enhancement interventions (e.g., Miller and Rollnick 2002; Nock and Kazdin 2005; Webb et al. 2002) into treatment programs.

Specifically, the findings underscore the importance of recruitment and retention of low-income families and minorities in clinical research (e.g., Huey and Polo 2008; Rodríguez et al. 2006).

Another implication of the ethnic difference findings is the need to consider if and how ethnicity and culture impact the effects of treatments. If ethnicity and culture are indeed important (and some evidence suggests this may be true; e.g., Arnold et al. 2003; Flicker et al. 2008), cultural competence and cultural adaptation become central issues in efforts to disseminate and implement treatments (Cunningham et al. 2002; Huey and Polo 2008; Lau 2006; Martinez and Eddy 2005; McClure et al. 2005). Research has identified several possible directions to consider. First, therapist-client cultural match may be important to some clients (see Sue 1998 for discussion). Hence, clinics and researchers may need to assemble a diverse staff. Similarly, treatments may need to be adjusted to match cultural beliefs and preferences of diverse families (Dwight-Johnson et al. 2000; Yeh et al. 2005). Conversely, some evidence supports the possibility that ethnic minorities are responsive to existent evidence-based treatments for internalizing disorders, as provided in research clinic settings (e.g., Miranda et al. 2005; Polo and López 2009). Additional research is required to explore whether extensive adaptations to treatment components or setting conditions are, in fact, needed to implement such evidence-based treatments for anxiety and depressive disorders with various ethnic minority groups at community sites.

Either way, it seems worth underscoring the importance of increasing representation of minority and low-income families in research studies. Recently, scholars and policy-makers have written about how best to accomplish this important goal (Yancey et al. 2006). Research has begun to examine the factors that contribute to greater success in recruiting and retaining minority participants into research studies, including strategies for building relationships in minority communities as well as increasing the cultural proficiency of research staff (e.g., Corbie-Smith et al. 2007; Kosoko-Lasaki et al. 2006). Clearly, future clinical research should move toward greater generalizability, particularly with regard to populations studied with less frequency.

Although the present study had many strengths, there were also weaknesses that should be considered. First, because this is a secondary data analysis of two extant datasets, we did not have overlapping measures for all domains of interest. For example, we did not have the same child-report anxiety measures across the two studies. Most problematic, different structured diagnostic interviews were used for the two studies. Because there are no studies that directly compare the degree of overlap between the DISC and the ADIS and because the variable measured by these measures was the primary matching variable for the

study (i.e., diagnosis), there is reason to be cautious in interpreting these results. Mitigating this concern are the facts that both interviews are highly structured, apply DSM-IV criteria, each have a strong psychometric profile, and were used by rigorously trained and closely supervised interviewers.

A second concern about the project concerns the fact that the research clinic sample was much larger than the community clinic sample. A larger community sample, and a larger sample of depressed youths, would increase confidence in the findings. Third, neither of the samples required a particular score on symptom scales, a procedure used in some recent clinical trial studies. As a result, there may be concern that the two samples may not be experiencing the same severity of symptoms as other clinical samples. However, as demonstrated in Table 1, the primary symptom measures in our two samples were comparable to those found in many other clinical studies of youth with anxiety or depressive disorders.

Fourth, we were unable to track differences in comorbid substance abuse, conduct and eating problems, amongst others, due to lack of comparable measures. Similarly, measures of family factors and other environmental characteristics available at one site were not administered at the other(s), limiting our comparison of other potential areas of difference.

Fifth, although we contend that the research clinic/community clinic difference is paramount in the present study, an argument could be made that other differences between the two settings may be more salient. We were able to control for geographic differences but not for these other possible differences, such as clinic funding, referral sources, and agency outreach procedures, all of which may contribute to case characteristics. Finally, the present results are from one study representing two settings and youth with only two different primary diagnoses. Although the findings coalesce with others in the literature, much more research is needed across other settings and diagnostic/problem areas.

Despite the limitations, the present study provides additional data suggesting that samples used in randomized controlled trials in research clinic settings appear to be different from community clinic samples in some potentially important ways. Future work should focus on determining the relevance of these differences to the effort to disseminate evidence-based treatments to community settings.

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