

# Children with Sexual Behavior Problems: Clinical Characteristics and Relationship to Child Maltreatment

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**Abstract** Research examining children with sexual behavior problems (SBP) almost exclusively relies on caregiver reports. The current study, involving a sample of 1112 children drawn from a prospective study, utilizes child self-reports and teacher reports, as well as caregiver-reports. First, analyses examined children displaying any SBP; a second set of analyses specifically examined children displaying interpersonal forms of SBP. Caregivers reported greater internalizing, externalizing, and social problems for children with general SBP and/or interpersonal SBP when compared to children without SBP. Caregiver concerns were rarely corroborated by teacher and child reports. Protective services records indicated that SBP was linked to childhood sexual abuse, but sexual abuse occurred in the minority of these cases. Physical abuse was more common among children with interpersonal forms of SBP. The data in the current study suggest the need for multiple reporters when assessing children presenting with SBP and that conventional views of these children may be misleading.

**Keywords** Sexual behavior problems · Child abuse · Posttraumatic stress · Externalizing problems · Internalizing problems

## Introduction

Children with sexual behavior problems (SBP) are increasingly coming to the attention of the mental health, child welfare, and justice systems [10]. In addition, the current 1-year stability estimate for SBP is 43 % [34], suggesting that SBP is not a fleeting or isolated concern for a large proportion of children. Complicating empirical efforts to understand SBP are the varying definitions of SBP used in studies. For instance, some studies focus exclusively on children displaying interpersonal sexual behavior problems (ISBP; e.g., sexually touching other children). The interest in children with ISBP is understandable as evidence suggests that sexually abusive acts committed by children may exert a similar impact on the victim as sexual abuse committed by adolescents or adults [4, 27]. However, other studies utilize a broader definition of SBP encompassing interpersonal, self-focused, and exhibitionistic behaviors. The conflating of these two definitions may mask underlying etiological differences, associated characteristics, and differences in treatment effectiveness.

Chaffin et al. [11] provide the most current definition of childhood SBP: “children ages 12 and younger who initiate behaviors involving sexual body parts that are developmentally inappropriate or potentially harmful to themselves or others (p. 200).” In addition to highlighting the diversity of behaviors classified as SBP, this definition also stresses that developmental appropriateness is an important consideration. Normal and abnormal sexual behavior of children is a function of the age of the child, with normative behaviors at one age being rare and problematic at another age [20]. There also are notable differences in the observed characteristics of children with SBP depending on the developmental period of the children in the study. For

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instance, in a small sample of young children ages 3–7 displaying ISBP ( $n = 37$ ) Silovsky and Niec [39] found that 65 % of the sample was female. Studies utilizing older samples of preteen children displaying ISBP generally find a higher prevalence of males [7, 29]. Unfortunately, many of the available studies use a range of children with ages spanning 6 or more years, yet often do not control for the impact of age on the outcomes. This makes it difficult to ascertain whether sampling methodologies (e.g., general SBP or intrusive SBP only), developmental periods, or another variable impacted outcomes.

Another limitation of the current literature is that most studies included total samples of <200 children, only a fraction of which displayed SBP. A notable exception to these critiques is the work of Friedrich et al. [22–25], which often included large samples drawn from general pediatric clinics, as well as clinical sources. These studies documented normative sexual behavior of children, providing prevalence estimates of single behaviors, as well as demonstrating that sexually abused children were at a significantly elevated risk of displaying SBP. In addition, these studies suggested that children with SBP often display other concerns, such as internalizing problems, externalizing problems, and social problems.

The current empirical literature suggests two primary theoretical models for understanding the etiology of SBP among children: traumatic sexualization and developmental psychopathology. The first and most prominent model is the “traumatic sexualization” theory of Finkelhor and Browne [19], which stresses the formative impact of child sexual abuse (CSA). This theory hypothesizes two primary causal mechanisms. The first is that the experience of CSA provides a social learning experience where the child develops an unhealthy belief that sexual behavior is a functional tool that can achieve a desired goal, such as attention or tangible rewards. The second mechanism involves posttraumatic stress pathways where a child experiences CSA-related intrusive thoughts and hyperarousal that then prompts the commission of sexual acts. Early reports provided support for the contention that CSA increases a child’s risk for SBP [26, 30]. Later evidence from comprehensive reviews [33] and large-scale studies with normative and CSA samples [23] further bolstered this perspective. Studies also note a significant relationship between posttraumatic stress and SBP among children who experienced CSA [5, 22], providing support to this theory. However, findings are not uniformly supportive as Drach et al. [15] conducted a study of 247 children and did not find a statistically significant relationship between sexual abuse history and the display of general SBP.

Evidence also suggests that the traumatic sexualization theory may be insufficient for explaining the occurrence of ISBP more specifically. For instance, studies by Bonner et al.

[7] and Silovsky and Niec [39] found that the minority of children with ISBP had a sexual abuse history, suggesting the presence of other causal mechanisms. In their sample of over 2300 children, Friedrich et al. [22] found that sexual abuse history was not the primary factor in the display of ISBP, but rather a model that included other child behavioral problems, parental physical coercion/abuse of the child, and family modeling of sexuality was most predictive. Such findings suggest that behavioral dysregulation may play a role in the commission of ISBP and that forms of maltreatment other than sexual abuse may be influential. Further support for this hypothesis comes from Merrick et al. [36], who showed that other forms of maltreatment (e.g., physical abuse, emotional abuse) are significantly correlated with general SBP and ISBP in a sample of non-sexually abused children. These results suggest that an alternative theory of SBP etiology is required.

Given evidence suggesting the possible correlation of multiple areas of emotional and behavioral dysregulation with SBP (e.g., [5, 22]), an alternative developmental psychopathology approach emerged. Elkovitch et al. [16] provide an excellent review of the multiple factors linked with SBP and integrates them within a developmental psychopathology framework. Importantly, this approach may help explicate the differences between SBP in general and ISBP. For instance, a number of studies support traumatic sexualization theory’s contention that general SBP may occur subsequent to CSA [23, 33]; however, the evidence linking CSA to ISBP is not as strong. It may be the case that core developmental deficits, such as poor social skills or impulse control problems, may be required for a child to violate the interpersonal space of others that is required for the commission of ISBP.

This study sought to address the limitations currently noted in the literature regarding our understanding of the relationships of maltreatment and clinical correlates with SBP among children. First, this study delineates between general SBP and ISBP when examining the association of various clinical and maltreatment correlates. Second, children in this study were from a very small age range (approximately 8 years of age), which eliminates the impact of age-related differences in the definition of normative sexual behavior. Third, this study includes assessments completed by multiple reporters. The vast majority of studies examining features associated with SBP utilize caregiver reports only. This creates a significant source of common method variance as SBP is typically defined by a caregiver-report measure. The current study utilizes reports from caregivers, teachers, and the children themselves. In addition, the study defines maltreatment using a widely utilized coding system for the review of CPS records, which were examined prospectively, thus eliminating the bias of retrospect report.

Given the previously reviewed theoretical positions and empirical research, the following hypotheses were made:

1. Sexual abuse will be more prevalent among children displaying SBP, but the majority of children with SBP will not have a sexual abuse history. Other forms of child maltreatment will also be more common among children with SBP.
2. Posttraumatic stress, a primary etiological factor according to traumatic sexualization theory, will be associated only with general SBP; it will not be associated with ISBP.
3. ISBP will be more strongly related to externalizing and social problems, as one would expect from a developmental psychopathology perspective.

In addition, one exploratory question was posed: given that SBP was assessed with a caregiver-report measure, as is typical in research on SBP, would child self-report and teacher-reports corroborate concerns noted by caregivers?

## Methods

### Participants

Data were drawn from the Longitudinal Studies in Child Abuse and Neglect (LONGSCAN) consortium. LONGSCAN is a series of prospective studies examining the impact of child maltreatment on developmental outcomes. Each of the five studies in the project is distinct, but all utilize a common set of measures, data collection methods, and points of assessment to allow for the analysis of data across studies. Two of the sites exclusively involve children who were brought to the attention of CPS because of concerns related to abuse and/or neglect. Two other sites include a mix of children with CPS involvement and matched controls without known CPS involvement. The final site sampled low income children from pediatric clinics who were not involved with CPS. All children were first identified prior to the age of 4 years and, collectively, the five sites enrolled a total of 1443 children and their caregivers. To learn more about the LONGSCAN project, the interested reader is referred to Runyan et al. [38].

At the age 8 assessments, the LONGSCAN sites administered the Child Sexual Behavior Inventory (CSBI; see description in the “Measures” section) to assess sexual behaviors. Data for the current analysis included all children whose caregivers completed the CSBI during the age 8 assessment ( $n = 1112$ ). The current sample was representative in terms of gender (51.6 % female,  $n = 574$ ), but was predominantly comprised of ethnic minority children (48.9 % African–American/Black, 24.0 % White, 9.0 % multiple ethnicities, 6.3 % Hispanic/Latino, 1.0 % other

ethnicities, 10.8 % missing data). As for the caregivers completing assessments, 93.4 % ( $n = 1039$ ) were female and 83.5 % ( $n = 929$ ) were biological relatives of the child. The caregivers were an average of 36.7 ( $SD = 10.4$ ) years of age and completed an average of 12.0 years of education ( $SD = 2.1$ ). This subsample did not differ from the larger LONGSCAN sample on these demographics.

### Measures

#### *Child Sexual Behavior Inventory (CSBI)*

The CSBI assesses the frequency of multiple sexual behaviors, both normative and abnormal. Caregivers rate the frequency of each behavior on a scale ranging from 0 (never occurred in the past 6 months) to 3 (occurred at least once per week in the past 6 months). The version of the CSBI used in LONGSCAN (CSBI-2) is a previous iteration of the currently available and copyrighted CSBI-3 [20]. The CSBI-2 was validated with a sample of over 1100 children [25]. In the interest of time, the LONGSCAN investigators consulted with Dr. William Friedrich to trim the original 35-item measure to the 26-item version that was administered at the 8-year assessment (child sexual behavior was not assessed at any other time point in the LONGSCAN study). For the purposes of the current study, the CSBI was used to identify children displaying general SBP and/or ISBP.

The CSBI-3 allows for gender and age-specific T-score conversions, making it possible to identify children displaying a concerning frequency of sexual behavior and thereby minimizing the chances of pathologizing developmentally normative behavior. A procedure was developed to allow the application of T-score cutoffs from the CSBI-3 to the modified CSBI-2 used in the LONGSCAN studies. The CSBI-3 contains 3 scales for assessing SBP: Total Scale, Developmentally Related Sexual Behavior (DRSB), and Sexual Abuse Specific Indicators (SASI). None of the CSBI-3 DRSB items for 8-year-old children were included on the LONGSCAN measure and, thus, the DRSB is not discussed further. It should be noted that despite its name, the SASI scale is considered more an assessment of unusual sexual behaviors than an assessment of behaviors indicative of sexual abuse. The cutoff scores on the CSBI-3 for clinically significant frequency of sexual behaviors ( $T > 64$ ) for 8-year-old children are as follows: for girls, a Total Scale score  $>7$  and/or a SASI score  $>3$ ; for boys a Total Scale score  $>9$  and/or a SASI score  $>5$ .

Of the 26 items of the modified CSBI-2 used in LONGSCAN, 23 were either identical or slightly modified versions of those items contained on the later CSBI-3. All items on the LONGSCAN version of the CSBI-2 were used

to calculate a Total Scale score (Cronbach's  $\alpha = .78$ ). In addition, 18 of the 23 CSBI-3 SASI items for boys and 12 of the 17 CSBI-3 SASI items for girls were included in the LONGSCAN measure. SASI scales were calculated for each participant using these items (boys:  $\alpha = .73$ ; girls:  $\alpha = .65$ ). One item on the CSBI-2 that was not on the CSBI-3 ("Imitates acts of sexual intercourse") was included in the summed score for the SASI scale for both genders as previous research noted that this behavior is highly unusual in normative samples (1.1 %; [25]). Given the differences in lengths of the measures, cutoff scores for denoting clinical significance were revised downward proportionally to be comparable to the CSBI-3 cutoff scores with fractions of a point being rounded up as this is the more conservative approach (i.e., fewer children identified as displaying SBP). This approach resulted in girls with Total Scale scores  $>5$  and/or SASI scores  $>2$  being identified as displaying SBP ( $n = 142$ ). As for the boys, those with Total Scale scores  $>6$  and/or SASI scores  $>5$  ( $n = 88$ ) were identified as exhibiting SBP. In recognition that some sexual behaviors may be significantly concerning even if the frequency is low, all interpersonal sexual behaviors (i.e., SBP involving another individual) were considered "critical items." Any endorsement of these items (see Table 1) resulted in a child being classified as displaying SBP regardless of T-scores, which yielded an additional 15 children categorized into the SBP group. Collectively, 867 children did not display significant SBP whereas 245 (22 %) did display SBP, with 77 of these children with SBP displaying at least one interpersonal sexual behavior (6.9 % of the full sample).

#### *Child Maltreatment Reports*

CPS records were reviewed and coded by LONGSCAN investigators using the Modified Maltreatment Classification System (MMCS; English and the LONGSCAN Investigators, [18]; as modified from the Maltreatment Classification System of Barnett et al. [6]). For the purposes of the current study, children were identified as experiencing a particular type of maltreatment if such allegations were present in the CPS files between birth and 8 years of age. Scores were coded for all 1112 cases and children received a dichotomized score (0 = Absent, 1 = Present) for each of four types of maltreatment: sexual abuse ( $n = 132$ ), physical abuse ( $n = 304$ ), neglect ( $n = 610$ ), and emotional maltreatment ( $n = 208$ ). Of the children in the study, 422 had no reported history of child maltreatment. For more information about the training of coders, the coding system, and inter-rater reliability, the reader is referred to English et al. [18].

#### *Child Behavior Checklist (CBCL)*

The CBCL [1] is a broadband, caregiver-report instrument assessing the frequency of various forms of emotional and behavioral concerns of children. The CBCL was normed on over 2300 children and validity is demonstrated in numerous studies [1]. Raw scores were used in this study as opposed to age-referenced T-scores as LONGSCAN investigators applied a minimum T-score of 50 to all raw scores below the 50th percentile. Thus, raw scores provide a greater source of variability. The Internalizing and Externalizing composites were employed to examine these constructs. In addition, the Social Problems and Attention Problems scales were used in this study as these constructs were related to SBP in other studies, but are not included in either of the two broader composites.

#### *Teacher Report Form (TRF)*

The TRF [2] is a broadband measure of child emotional and behavioral concerns from the perspective of the child's teacher. The TRF is a companion to the CBCL and generally assesses the frequency of the same symptom categories. Standardization and validity data are available from Achenbach [2]. As with the CBCL, raw scores are utilized in this study for the Internalizing and Externalizing composites and the Social Problems and Attention Problems scales. LONGSCAN investigators attempted to obtain the TRF from the teachers of the children involved in the study; however, as would be expected, the response rate was significantly below that of the child's caregiver ( $n = 707$ ).

#### *Trauma Symptom Checklist for Children (TSCC)*

The TSCC [8] is a self-report measure assessing various emotional and trauma-related concerns among children. The child reports the frequency with which he or she experiences each of 54 items on a scale from 0 (Never) to 3 (Almost all the time). The TSCC was standardized on over 2800 children and demonstrates acceptable validity across multiple samples [8]. The current study uses the TSCC subscales of Anxiety, Depression, Anger, and Posttraumatic Stress. Raw scores were used for all scales.

#### **Handling of Missing Data**

Of the 1112 children whose caregivers completed the CSBI, complete data were available for gender, recruitment site, and all maltreatment variables. Missing data were observed for CBCL scores ( $n = 70$ , 6.3 %), TSCC scores ( $n = 142$ , 12.8 %) and TRF scores ( $n = 405$ , 36.4 %). In

**Table 1** Descriptive statistics

	General SBP analyses		ISBP analyses	
	No SBP	SBP	No ISBP	ISBP
<i>N</i>	867	245	1035	77
<i>Sexual behaviors</i>				
CSBI total: <i>M(SD)</i>	1.26(1.53)	8.38(5.83)	2.18(2.8)	11.64(8.47)
CSBI SASI: <i>M(SD)</i>	.93(1.17)	6.05(4.1)	1.59(2.06)	8.32(5.93)
Intrusive sexual behaviors: <i>f (%)</i>				
1. Asks others to engage in sexual acts		18(7.3)		18(23.4)
2. Touches other people's private parts		43(17.6)		43(55.8)
3. Puts mouth on others' private parts		8(3.3)		8(10.4)
4. Touches animals' sexual parts		8(3.3)		8(10.4)
5. Tries to undress others against their will		12(4.9)		12(15.6)
6. Imitates acts of sexual intercourse		33(13.5)		33(42.9)
<i>Maltreatment allegations</i>				
Sexual abuse allegation: <i>f (%)</i>	79(9.1)	53(21.6)	116(11.2)	16(20.8)
Physical abuse allegation: <i>f (%)</i>	209(24.1)	95(38.8)	271(26.2)	33(42.9)
Neglect allegation: <i>f (%)</i>	451(52.0)	159(64.9)	561(54.2)	49(63.6)
Emotional maltreatment allegation: <i>f (%)</i>	222(25.6)	86(35.1)	284(27.4)	24(31.2)
<i>Emotional and behavioral outcomes (pooled means)</i>				
CBCL: social problems	2.42	3.86	2.61	4.52
CBCL: attention problems	3.83	6.2	4.10	7.74
CBCL: internalizing composite	6.22	9.59	6.74	9.93
CBCL: externalizing composite	10.85	18.31	11.82	21.6
TRF: social problems	3.67	4.05	3.66	5.06
TRF: attention problems	14.07	14.88	14.03	17.13
TRF: internalizing composite	8.02	7.9	7.94	8.67
TRF: externalizing composite	14.6	15.79	14.69	17.24
TSCC: anxiety	8.26	9.74	8.51	9.68
TSCC: depression	7.7	8.8	7.90	8.53
TSCC: anger	6.27	7.68	6.53	7.2
TSCC: posttraumatic stress	10.42	12.22	10.74	11.88

CSBI Child Sexual Behavior Inventory, SASI Sexual Abuse-Specific Indicators subscale, CBCL Child Behavior Checklist, TRF Teacher Report Form, TSCC Trauma Symptom Checklist for Children

each case it appears that the protocols were not obtained as data were missing on all subscales within each measure. Multiple imputation (MI) was selected to handle the missing data. MI is considered a state-of-the-art technique for handling missing data and in large samples, such as that employed in this study, simulation studies demonstrate that MI yields estimates similar to those obtained from maximum likelihood estimation [17]. MI is a regression-based approach that creates numerous datasets with varying values imputed in place of the missing data. Desired analyses are then computed using each derived dataset and the results are pooled to obtain the final statistics [37]. MI was computed with SPSS v22 using the Markov Chain Monte Carlo (MCMC) imputation procedure. Analysis of time-series plots and autocorrelation function plots indicated a

quick convergence for all variables; <10 iterations in each case. A conservative approach was used and the dataset was saved after each 100 iterations. A total of 20 imputed datasets were utilized, as recommended by Graham et al. [28].

### Analytic Plan

Given that the sites involved in the LONGSCAN data used two different recruitment strategies (i.e., CPS-involved only, samples including children not involved with CPS), a dichotomized variable identifying the method of recruitment was entered as a covariate in all parametric analyses. This approach is consistent with other analyses of LONGSCAN data (e.g., [36]). Gender also was entered as a



covariate since non-gender referenced raw scores were used for analyses. Two separate sets of analyses were performed: The first set examined differences between children based on whether they displayed SBP, and the second set of analyses examined differences between children who did and did not display ISBP.

Chi-square analyses examined independence of maltreatment allegations from the display of SBP and ISBP. Since every child had a score for each type of maltreatment, the complete dataset was used for all Chi-square analyses. Next, the MI datasets were used to compute a series of multiple linear regressions entering both covariates as well as the dichotomous SBP group variable (0 = Absent, 1 = Present) as predictors of the 12 continuous outcome variables. This method is equivalent to computing a series of analyses of covariance (ANCOVAs); however, using ANCOVA with multiple imputation is difficult as rules for pooling ANOVA-based results across datasets are not available [42]. Results are reported in pooled unstandardized regression coefficients ( $b_p$ ) with 95 % confidence intervals, and  $t$  and  $p$  values of the pooled coefficient. Hierarchical entry of variables was used to derive  $\Delta R^2$  attributable to the SBP group as an index of effect size, which is reported as a range from the lowest observed value in a dataset to the largest observed value. Given the relatively large number of analyses, a Bonferroni correction was made to correct for test-wise alpha inflation; consequently, only statistics with  $p \leq .002$  are reported as significant. These analyses were completed with SPSS v22.

In addition, in the first identified analysis of its kind with SBP, Bayesian analyses were computed to examine the relative strength of the alternative and null models. As opposed to the frequentist perspective that examines the probability of finding an observed difference between groups if the null hypothesis is true (i.e.,  $p$  value), Bayesian analysis directly examines the probability of observing the obtained data under different models [31]. Bayesian analysis makes use of Bayes Factor (BF), which is a likelihood ratio comparing the probability of observing the obtained data under the conditions of the alternative hypothesis (i.e., there is a difference between SBP and non-SBP children) to the likelihood of observing the obtained data under the null hypothesis (i.e., there is no difference between the groups). Therefore, a score of 1.0 suggests that the data are equally likely to occur under each model, scores  $>1.0$  favor the alternative model, and scores  $<1.0$  favor the null model. Kass and Raftery [32] suggest that BF scores from 1 to 3 provide weak evidence for the alternative model, while scores from 3 to 20 provide positive support, 20–150 provide strong support, and  $\text{BF} > 150$  provides very strong support for the alternative model. The use of MI allows for a common set of data for the calculation of Bayesian and

frequentist statistics; however, the use of MI results in the derivation of 20 separate BFs for each analysis described above. Since BF is a proportion defined by a floor of 0 and easily inflated by relatively small changes in the likelihood of one model or another, the median Bayes Factor ( $\text{BF}_{\text{mdn}}$ ) of the distribution of obtained BFs and the range of BFs obtained ( $\text{BF}_{\text{range}}$ ) are reported for each analysis. The Bayesian equivalent of the frequentist analyses discussed above were calculated using JASP 0.6.5 [35].

## Results

### Maltreatment Histories

Table 1 displays all pooled descriptive statistics, as well as frequencies for types of maltreatment allegations. As expected, children displaying general SBP were significantly more likely to have previous allegations of sexual abuse than control children ( $X^2 = 28.6$ ,  $p < .001$ , Cramer's  $V = .16$ ). Comparable results were found for physical abuse allegations ( $X^2 = 20.7$ ,  $p < .001$ ,  $V = .14$ ), and neglect allegations ( $X^2 = 12.8$ ,  $p < .001$ ,  $V = .11$ ), but not allegations of emotional maltreatment ( $X^2 = 8.6$ ). Bayesian analyses provided support that each type of maltreatment was associated with general SBP: sexual abuse ( $\text{BF} > 1000$ ), physical abuse ( $\text{BF} > 1000$ ), neglect ( $\text{BF} = 59.21$ ), and emotional maltreatment ( $\text{BF} = 5.56$ ).

Interestingly, a different pattern of results emerged when children were classified according to whether they displayed ISBP. Frequentist statistics suggested that physical abuse was related to ISBP ( $X^2 = 10.03$ ,  $p = .002$ ,  $V = .10$ ), but none of the other forms of maltreatment were related (sexual abuse:  $X^2 = 6.28$ ; neglect:  $X^2 = 2.58$ ; emotional maltreatment:  $X^2 = .50$ ). Bayesian analyses likewise found support for the hypothesis that physical abuse increases risk for ISBP, although the results were not strong ( $\text{BF} = 5.65$ ). Analyses for sexual abuse ( $\text{BF} = .66$ ), neglect ( $\text{BF} = .2$ ), and emotional maltreatment ( $\text{BF} = .07$ ) actually favored the null hypothesis.

### Caregiver Reported Concerns

As shown in Table 2, caregivers rated children with general SBP significantly higher on each scale of the CBCL than children without SBP, with effect sizes ranging from small to medium [12]. Similarly, the results of Bayesian analyses provided overwhelming support for the conclusion that children with SBP display greater concerns on each scale as all BFs were over 1000. Interestingly, similar results were found for analyses specifically examining children displaying ISBP (see Table 3). Both forms of

**Table 2** Results of frequentist and Bayesian analyses for general sexual behavior problems

Outcome	$b_p^a$ (95 % CI)	$t$	$\Delta R^2$	BF <sub>mdn</sub>	BF <sub>range</sub>
CBCL: social problems	1.35 (1.01–1.69)	7.85*	.05–.06	>1000	all >1000
CBCL: attention problems	2.29 (1.75–2.83)	8.25*	.06–.07	>1000	all >1000
CBCL: internalizing composite	3.17 (2.28–4.07)	6.94*	.04–.05	>1000	all >1000
CBCL: externalizing composite	7.3 (6.06–8.53)	11.6*	.10–.11	>1000	all >1000
TRF: social problems	.38 (–.18 to .94)	1.34	.00–.01	.52	.16–1.44
TRF: attention problems	1.18 (–.41 to 2.76)	1.46	.00–.01	.46	.15–3.75
TRF: internalizing composite	–.17 (–1.18 to .85)	.52	.00	.14	.13–.27
TRF: externalizing composite	1.79 (–.37 to 3.94)	1.63	.00–.01	.77	.16–5.99
TSCC: anxiety	1.12 (.25–1.98)	2.52	.01	2.93	1.53–7.59
TSCC: depression	.81 (.03–1.59)	2.04	.00–.01	1.2	.45–4.09
TSCC: anger	1.42 (.56–2.28)	3.22*	.01	29.48	5.5–159.92
TSCC: posttraumatic stress	1.47 (.47–2.49)	2.88	.01	8.28	2.8–99.77

<sup>a</sup> General SBP [0 = Absent ( $n = 867$ ), 1 = Present ( $n = 245$ )]

\*  $p \leq .002$  (Bonferroni corrected  $p$  value)

**Table 3** Results of frequentist and Bayesian analyses for interpersonal sexual behavior problems

Outcome	$b_p^a$ (95 % CI)	$t$	$\Delta R^2$	BF <sub>mdn</sub>	BF <sub>range</sub>
CBCL: social problems	1.85 (1.3–2.39)	6.62*	.04	>1000	all >1000
CBCL: attention problems	3.34 (2.46–4.22)	7.45*	.05	>1000	all >1000
CBCL: internalizing composite	2.96 (1.5–4.42)	3.97*	.01–.02	270.98	134.14–551.17
CBCL: externalizing composite	9.02 (6.97–11.07)	8.64*	.06–.07	>1000	all >1000
TRF: social problems	1.23 (.31–2.14)	2.63	.00–.01	6.98	1.39–170.84
TRF: attention problems	2.47 (.0–4.94)	1.96	.00–.01	1.13	.25–10.16
TRF: internalizing composite	.52 (–1.16 to 2.21)	.61	.00	.16	.13–.62
TRF: externalizing composite	1.89 (–1.65 to 5.43)	1.05	.00–.01	.27	.13–2.44
TSCC: anxiety	1.0 (–.41 to 2.41)	1.39	.00	.32	.19–.64
TSCC: depression	.39 (–.82 to 1.63)	.61	.00	.15	.13–.2
TSCC: anger	.37 (–1.03 to 1.77)	.52	.00	.15	.13–.25
TSCC: posttraumatic stress	.78 (–.82 to 2.37)	.95	.00	.21	.14–.26

<sup>a</sup> ISBP [0 = Absent ( $n = 1035$ ), 1 = Present ( $n = 77$ )]

\*  $p \leq .002$  (Bonferroni corrected  $p$  value)

statistical analysis demonstrated that caregivers rated the ISBP children higher on all scales examined.

### Teacher Reported Concerns

Teachers generally provided a contrasting picture to that reported by caregivers. Frequentist statistics found no significant results for any of the outcomes, regardless of whether children were categorized according to general SBP or ISBP status (Tables 2, 3). Bayesian analyses offered support for the alternative hypothesis in only two instances. First, a BF<sub>mdn</sub> of 6.98 was obtained when

examining social problems of children displaying ISBP. The accompanying BF<sub>range</sub> was entirely above 1.0, suggesting that the data obtained were more likely to occur under the hypothesis that ISBP children are different from other children for each of the 20 imputed datasets; however, the size of the median BF was moderate. The other median BF that favored the alternative hypothesis (Attention Problems) was barely above 1.0 and not sufficient evidence for inferring an effect. Collectively, the teacher reported concerns do not corroborate caregiver reports with the exception that children displaying ISBP are more likely to demonstrate problems in social settings than their peers.

## Self-Reported Concerns

According to frequentist analyses, children with general SBP self-reported significantly greater concerns only for anger, with a small effect size noted (Table 2). Results for posttraumatic stress approached the threshold for statistical significance ( $p = .004$ ). Interestingly, Bayesian analyses supported the alternative hypothesis for all four outcomes, but only two of which were of sufficient degree to warrant mention. The evidence was strong in favor of children with general SBP self-reporting greater concerns for anger ( $BF_{\text{mdn}} = 29.48$ ) and more moderate for these children reporting greater levels of posttraumatic stress ( $BF_{\text{mdn}} = 8.28$ ). When analyses examined the self-reported concerns of children displaying ISBP, no statistically significant results were found and Bayesian analyses overwhelming supported the null hypothesis in each case. These results corroborate caregiver concerns related to externalizing problems for children with general SBP and support the hypothesis that posttraumatic stress is related to general SBP.

## Discussion

Previous research examining children with SBP was limited by numerous factors: varying definitions of SBP, large developmental span of the children included, and/or exclusive reliance on caregiver-report. This study sought to address each of these concerns while also embedding the analyses within relevant theoretical frameworks. Specifically, this study identified three primary hypotheses developed from previous research and the theories of traumatic sexualization and developmental psychopathology.

The first hypothesis was that CSA would be related to SBP, but that a minority of children with SBP would have a CSA history. This hypothesis was supported: sexual abuse was more prevalent among children with general SBP (21.6 %) than children without SBP (9.1 %), and sexual abuse was present in only a minority of children with general SBP. Also as expected, physical abuse and neglect were more common among children with general SBP and the evidence examining the prevalence of emotional maltreatment across groups was mixed. Interestingly, however, physical abuse was the only type of maltreatment more likely to occur among children identified as displaying interpersonal forms of SBP. This last finding suggests that the experience of sexual abuse may be linked to general SBP, but not with interpersonal forms of SBP.

The second hypothesis, that posttraumatic stress would be associated with general SBP, but not ISBP, also was supported. Bayesian analyses supported the contention that children with general SBP were more likely to report

posttraumatic stress than the non-SBP group, but posttraumatic stress was not related to the display of ISBP. However, it should be noted that the relationship between posttraumatic stress and general SBP was moderate and was not observed using frequentist statistics as a result of the Bonferroni correction employed. This finding supports the conclusion that general SBP may be at least partially related to the presence of posttraumatic stress, but also demonstrates that interpersonal forms of SBP are unlikely to be related to posttraumatic stress.

The conclusion regarding the final hypothesis, that ISBP would be more strongly related to externalizing and social problems, is mixed. Caregivers reported that children with general SBP were more likely to display concerns in each of the areas examined: social problems, attention problems, internalizing problems, and externalizing problems. However, teachers of the children did not corroborate this evidence for any of the variables and the children themselves only reported significantly greater concerns for anger, which would corroborate the caregivers' report of externalizing and social problems. A similar pattern emerged when children were categorized on the display of ISBP. Caregivers reported significantly greater concerns in all areas for these children compared to their peers, but the only supporting evidence came from the Bayesian analysis of teacher reports for social problems. It should be noted that these last results also answer the exploratory question of whether teacher reports and child self-reports would corroborate caregiver-reported concerns. With few exceptions, neither teachers nor the children themselves shared caregivers' concerns.

Collapsing across hypotheses, the current study finds moderate support for the traumatic sexualization etiological theory for general SBP only. Sexual abuse was more likely to occur with children displaying these concerns and these children were more likely to report posttraumatic stress. As such, the theoretical tenets that SBP may be the result of social learning and/or posttraumatic stress reactions are supported. However, enthusiasm for this theory is tempered by the finding that the majority of children with general SBP did not have a sexual abuse history and the relationship of posttraumatic stress to SBP was not overwhelming. There was no evidence observed that supports the traumatic sexualization theory as a viable hypothesis for the commission of ISBP.

Support was observed for the developmental psychopathology hypothesis. Children with general SBP and ISBP specifically were more likely to have experienced various forms of maltreatment, and allegations of neglect and physical abuse were more prevalent among these children than allegations of sexual abuse. In addition to caregivers reporting broadband concerns, children with general SBP were more likely themselves to report



concerns with anger. This finding suggests that behavioral and/or emotional dysregulation manifesting in externalizing and/or social problems may also underlie SBP. When examining children with ISBP, caregiver reports of multiple concerns were supported by mixed indications of teacher reports that these children exhibit more social problems in the school setting. These results provide evidence for a developmental psychopathology etiological approach to general and interpersonal SBP that operates primarily through externalizing pathways.

The finding that physical abuse was the only form of maltreatment significantly related to ISBP deserves consideration. This finding coincides with Friedrich et al.'s [22] finding that modeling of coercive behavior is a primary etiological factor in the development of ISBP. Physical abuse by its very nature necessitates a form of power assertive intrusion on the physical space of another that may or may not be present with other forms of maltreatment (at least as it is perceived by the child). This modeling of the coercive violation of the personal space of others may be a key etiological factor in the development of ISBP.

The results of the current study suggest that much of the prior research linking various clinical correlates with SBP may be the result of common method variance. Child sexual behavior is almost exclusively assessed via caregiver-report, as are other emotional and behavioral concerns in SBP studies. There are numerous potential reasons for this observed relationship. For instance, the child's sexual, emotional, and behavioral concerns may primarily be limited to the home environment or a distressed parent attempting to cope with a problematic child may fail to discriminate between diverse forms of psychopathology when reporting concerns. Regardless, it is apparent from the current study that the common method variance involved with soliciting solely caregiver-reports is problematic in studies of SBP. Future studies of SBP should attempt to validate caregiver reports with other methods of assessment.

The current study suggests that trauma-focused interventions aimed at ameliorating posttraumatic stress stemming from sexual abuse may be beneficial for treating SBP in some instances. Indeed, clinical trials appear to demonstrate such benefit from trauma-focused cognitive-behavioral therapy (TF-CBT; [13, 14]). However, given that sexual abuse and posttraumatic stress were not related to ISBP, it seems unlikely that such an intervention will be sufficient to improve ISBP. As such, a thorough assessment should examine whether the SBP observed is related to posttraumatic stress prior to beginning an intervention such as TF-CBT. An alternative treatment strategy suggested by this study is one that utilizes interventions targeting

externalizing problems. Indeed, in a meta-analysis of treatment outcome research for SBP conducted by St. Amand et al. [41], the most effective treatment components for SBP were caregiver-focused and included the use of behavioral child management skills, common treatment approaches for externalizing behavior problems. Friedrich [21] describes the use of a behavioral parent training model for SBP and provides case observations promoting further research on this approach. A group cognitive-behavioral program integrating these components has demonstrated positive results in clinical trials [9, 40] and case observations suggest the program may be effective when delivered in an individual format [3].

One should view this study within the context of its limitations. Although a benefit of the study was the elimination of developmental trends as a confounding factor in analyses, this also precludes generalization of the current results to children outside of the 8-year-old, middle childhood age range. As mentioned previously, the sample was also an at-risk sample with the majority of children having allegations of at least one form of maltreatment. It is unclear how these results would generalize to a non-maltreated and/or higher socioeconomic sample of children. Although psychometrically sound instruments were used, the potential of underreporting on the part of the child and/or teachers cannot be ruled out. Lastly, this study used a prospective dataset, but did not utilize longitudinal or mediational analyses. As such, causal mechanisms were not directly tested. Future research should examine if these results can be replicated with other samples, especially in regards to the teacher and child self-report instruments. In addition, longitudinal analyses of mediating and moderating mechanisms may be crucial to the development of effective interventions.

## Summary

Children with sexual behavior problems (SBP) are a diverse population and often misunderstood by practitioners and academics. The current study suggests that the experience of sexual abuse is related only to SBP generally conceived; sexual abuse does not appear related to interpersonal forms of SBP. Rather, physical abuse is more strongly related to the display of interpersonal SBP. When examining concomitant features of SBP, caregivers of these children reported greater elevations than control children for a multitude of concerns, regardless of whether SBP was defined in a general way or restricted to interpersonal forms. However, when examining teacher-report and child self-report, few differences were noted in relation to co-occurring concerns. Given that SBP was measured by

caregiver report, it appears reasonable to assume that common method variance is a significant factor in the identification of correlates with SBP. Clinicians are advised to conduct a thorough assessment of children presenting with SBP, including obtaining reports from multiple informants.

#### Compliance with Ethical Standards

**Conflict of interest** The author has no conflicts of interest to disclose.

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