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Sexual Behavior Problems in Child Welfare: Predictors of Reliable Change

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SEXUAL BEHAVIOR PROBLEMS IN CHILD WELFARE: PREDICTORS OF RELIABLE CHANGE

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ABSTRACT

This study examined predictors of changes in children's sexual behaviors across two time points within a sample of youth in the child welfare system. Hypothesized predictors of increases or decreases in children's sexual behaviors included child attributes, positive parenting, exposure to sexuality and violence, maltreatment history and child welfare placement history, and treatment variables. Participants included 145 children with reported sexual behavior problems and their primary caregivers and mental healthcare providers. Children's sexual behaviors were classified as improved, worsened, or unchanged. Optimal Data Analysis (ODA) and multivariate classification tree analysis (CTA) via ODA were used to identify predictors of children's classification status and to form subgroups of youth based on interactions between predictors. Results indicated that child functioning (i.e., internalizing and externalizing symptoms) and treatment variables (e.g., sex education) were significant predictors of children's classification status. Post-hoc analyses revealed differences between subgroups with regard to child variables and therapist theoretical orientation. These results highlight associations between internalizing and externalizing symptoms and children's sexual behaviors, as well as the benefits of including education in clinical services for children with sexual behavior problems. Future research should continue to examine the appropriateness of various treatment approaches for children with specific symptom presentations.

CHAPTER I

INTRODUCTION

Scholarly interest in sexual behavior problems among children has increased substantially since this issue was first identified by researchers 25 years ago (Grant & Lundeberg, 2009). Though there is no single agreed-upon definition of problematic sexual behaviors, broadly, such behaviors can be described as actions exhibited by children ages 12 or younger "involving sexual body parts (i.e., genitals, anus, buttocks, or breasts) that are developmentally inappropriate or potentially harmful to themselves or others" (Chaffin et al., 2008, p. 200). Such behaviors are clearly maladaptive for several reasons. Children who engage in problematic sexual behaviors place themselves at risk for victimization by others and removal from their homes, and they can also inflict psychological and physical harm on other children who are exposed to their behaviors (Baker, Schneiderman, & Parker, 2002; Baker et al., 2008; Chaffin et al., 2008). Though sexual behavior problems have been observed in normative samples (e.g., Friedrich, Davies, Feher, & Wright, 2003), this issue is uniquely relevant to youth in the child welfare system. Not only are a substantial number of children with sexual behavior problems involved with child welfare (Baker et al., 2002), but experiences of maltreatment (i.e., neglect and abuse) are associated with the presence of problematic sexual behaviors (See Elkovitch, Latzman, Hansen, & Flood, 2009 and Grant & Lundeberg, 2009 for review).

The potential negative outcomes associated with sexual behavior problems suggest the importance of identifying and providing appropriate intervention services for children who exhibit such problems. To successfully identify these children, however, it is first necessary to clarify the distinction between normative and problematic sexual behaviors across children of different ages, genders, and cultural backgrounds (Friedrich, Fisher, Broughton, Houston, & Shafran, 1998; Thigpen, 2009; Thigpen & Fortenberry, 2009; Thigpen, Pinkston, & Mayefsky, 2003). Such efforts have likely been limited by difficulties associated with studying sexual behaviors in children, including ethical concerns (Grant & Lundeberg, 2009). Cultural and societal views of children as asexual also hinder research on normative child sexual behaviors (Thigpen et al., 2003). The desire to protect children from exposure to sexual content has meant that most studies of children's sexual behaviors are based on parent or retrospective self-reports rather than on direct child reports (Thigpen, 2009). Without an adequate understanding of normative child sexual behavior across diverse populations and contexts, it has been difficult to clearly define what behaviors are problematic for whom (Elkovitch et al., 2009). Moreover, because sexual development progresses throughout childhood (Gil, 1993), behaviors that are appropriate at one age may not be at another (Chaffin et al., 2008), further complicating the definition of sexual behavior problems.

In recent years, a number of studies have attempted to provide data regarding normative child sexual behaviors and to clarify distinctions between developmentally appropriate and problematic sexual behaviors. Contrary to the societal belief noted above, empirical evidence suggests that a variety of sexual behaviors are commonly observed among children prior to the age of 13 (e.g., Friedrich et al., 1998). In fact, Friedrich and

colleagues (1998) identified a set of behaviors that are considered "developmentally-related" for boys and girls in three age groups ranging from two to 12 years (p. 4). Work by Thigpen (2009; Thigpen et al., 2003; Thigpen & Fortenberry, 2009) extends the research on normative child sexual behaviors by highlighting the importance of culture and comparing the behaviors of low-income, African-American children to those of the primarily Caucasian children studied by Friedrich and his colleagues (Friedrich, Grambsch, Broughton, Kuiper, & Beilke, 1991; Friedrich et al., 1998). Knowledge of cultural differences in sexual behaviors is particularly important for evaluating such behaviors within the child welfare system, as African-American children are overrepresented within this population (Knott & Giwa, 2012; Thigpen, 2009).

In spite of the expanding research base on the subject of children's sexual behavior problems, a number of limitations remain within the extant literature. First, because most studies of problematic sexual behaviors are cross-sectional, understanding of the course of these behaviors is limited. Furthermore, most of the longitudinal studies that have been conducted either focus on treatment without considering child, family, or community factors or address the persistence of sexual behavior problems while failing to determine children's involvement in treatment. Additionally, little is currently known about the ways in which various predictors may interact to influence children's sexual behaviors. Other limitations include a tendency to use single-informant methodology and the use of primarily Caucasian samples. Finally, previous longitudinal studies (Friedrich et al., 2005; Lévesque, Bigras, and Pauzé, 2012; McCrae, 2009) have used a dichotomous outcome (having sexual behavior problems versus not having them), which limits

identification of qualitative or more nuanced quantitative changes in children's sexual behaviors (See Friedrich et al., 2005).

The present study seeks to address the limitations described above. Using Optimal Data Analysis (ODA; Soltysik & Yarnold, 1993; Yarnold & Soltysik, 2005), predictors of increases and decreases in sexual behaviors will be examined within a sample of primarily African-American child welfare youth identified as having sexual behavior problems. The use of ODA permits the inclusion of numerous predictors without increasing the risk of experimentwise Type I error. Additionally, ODA can identify interactions among variables that predict changes in children's sexual behaviors, making it well suited to the experimental nature of this study. Unlike in many previous studies, several sources of data (child report, caregiver report, mental healthcare provider report, and child welfare records) were employed in the present study, and data pertaining to both a variety of child attributes and to several dimensions of therapy (e.g., theoretical orientation, therapeutic alliance) were combined to permit a more comprehensive understanding of changes in sexual behaviors. Finally, rather than merely classifying children as having sexual behavior problems or not, this study will use statistically reliable change in sexual behaviors as an outcome. In doing so, it will ensure that improvement or deterioration in children's sexual behaviors is not merely due to measurement error while also permitting a more sensitive measure of change than that used in previous studies of persistence of sexual behavior problems. By contributing to an understanding of factors that influence changes in children's sexual behaviors, this study aims to identify children who are at risk for continued problems and to clarify the most appropriate targets for intervention.

In the remainder of the introduction, this paper will review what is currently known about normative child sexual behaviors. Next, it will provide an overview of children's sexual behavior problems and the many variables that have been associated with such behaviors. Cultural influences on children's sexual behaviors will then be discussed, followed by a consideration of the unique relevance of sexual behavior problems to the child welfare system. Finally, findings from longitudinal studies pertaining to the course and treatment of children's sexual behavior problems will be described.

CHAPTER II

NORMATIVE CHILD SEXUAL BEHAVIOR

The development of human sexuality is a process that is typically associated with adolescence and adulthood. In actuality, however, sexual responses and development are present as early as infancy (See Thigpen et al., 2003 for review). For example, curiosity regarding sexuality as well as engagement in a variety of sexual behaviors during childhood is typical (Chaffin et al., 2008), and it is now considered developmentally appropriate for children, including infants, to engage in some sexual behaviors (See Elkovitch et al., 2009 and Gil, 1993). Like other domains of children's lives (e.g., social, emotional, and physical), normative sexuality is believed to follow a developmental course throughout childhood and adolescence (Gil, 1993). This trajectory parallels other aspects of children's development, including cognitive capacities and social interactions (See Gil, 1993 for review). For instance, in early childhood, children typically have limited access to peers (social) and are egocentric and disinhibited (cognitive), so it is not surprising that it is normative for children at this age to engage in self-stimulation and self-exploration. Consistent with the natural curiosity characteristic of this developmental period, young children may also observe others' body parts, while the tendency to imitate others manifests itself in such activities as playing house or doctor.

As children reach school-age, they become more focused on others as their social worlds expand, providing them with opportunities for increased interaction and exposure to a variety of sexual behaviors (Gil, 1993). Children's inquisitiveness may lead to an interest in sexuality and the body, while personal privacy takes on greater significance. Finally, as children approach and undergo puberty, they experience dramatic physical development. Accompanying these changes is continued personal and social growth, including phases of both inhibition and disinhibition, ongoing peer contact and exposure to broader social and cultural influences, and experimentation with dating and interpersonal sexual behaviors (Gil, 1993).

As the previous discussion of children's development suggests, engagement in sexual behaviors prior to adolescence and the onset of puberty is not uncommon. Both retrospective studies of undergraduates and parent reports of children's behavior suggest that a substantial portion of children engage in some form of sexual behavior. For instance, 42% of college students reported that they interacted sexually with another child (typically a friend) when they were 12 years old or younger (Haugaard & Tilly, 1988). These behaviors primarily consisted of kissing, sexual hugging, and exposure, though behaviors such as fondling and actual or attempted intercourse were also reported. Other studies suggest that sexual behavior is actually much more common. A study of female undergraduates found that 85% engaged in childhood sexual play (Lamb & Coakley, 1993), and a study of mothers indicated that 77% of children were involved in sex play (e.g., masturbation, attempted intercourse, or games such as doctor or house) before age six (Okami, Olmstead, & Abramson, 1997). For 29% of the children in this sample,

masturbation was the only form of sex play reported, suggesting that children's sexual behaviors can be both solitary and interactive.

Despite the range of behaviors reported in these and other studies, it is important to note that certain common attributes characterize normative child sexual behavior and distinguish it from the problematic behaviors that will be discussed subsequently. According to the Association for the Treatment of Sexual Abusers (ATSA) Task Force on Children with Sexual Behavior Problems, normal sexual behavior in childhood is spontaneous, intermittent, noncoercive and mutual (if multiple children are involved), and does not cause emotional distress or become a preoccupation (Chaffin et al., 2008). Furthermore, behaviors central to adult sexuality such as intercourse are typically not present.

As the studies described above suggest, a range of children's sexual behaviors has been described in normative samples (e.g., Friedrich et al., 1991; Friedrich et al., 1998). Attempts to categorize children's sexual behaviors have also been made, including Friedrich et al.'s (1991) work positing nine categories: (1) gender role behavior, (2) sexual knowledge, (3) sexual anxiety, (4) self-stimulation, (5) sexual interest, (6) voyeuristic behavior, (7) adherence to personal boundaries, (8) exhibitionism, and (9) sexual intrusiveness (See Table 1 for example behaviors from Friedrich et al., 1998). Each of these categories has parallel manifestations in adults' sexual behaviors (Friedrich et al., 1998).

Table 1. Examples of Children's Sexual Behaviors

Category	Example Behavior
Gender role behavior	Dressing like a member of the opposite sex
Sexual knowledge	Having greater knowledge of sex than one's peers
Sexual anxiety	Becoming upset in the presence of adults who are kissing
Self-stimulation	Touching one's own sex parts
Sexual interest	Interest in the opposite sex
Voyeuristic behavior	Attempting to look at individuals who are undressed
Adherence to personal boundaries	Standing too close to another person
Exhibitionism	Exposing one's genitals to others
Sexual intrusiveness	Touching another child's genitals

While children may exhibit any of a large number of sexual behaviors, the prevalence of these behaviors varies widely, both among same-age children and over the course of development (Friedrich et al., 1991; Friedrich et al., 1998). Though the criteria offered by the ATSA task force (spontaneous, intermittent, noncoercive, mutual, non-distressing, and non-compulsive; Chaffin et al., 2008) can be helpful in distinguishing between behavior that is relatively healthier and more normative versus problematic, these attributes are difficult to measure; thus, it is also beneficial to identify specific behaviors whose presence at various stages of development can be considered normative. Noting the need to develop a better understanding of normative child sexual behavior and to measure such behavior objectively, Friedrich and colleagues (Friedrich et al., 1991; Friedrich et al., 1992) developed the Child Sexual Behavior Inventory (CSBI), a parent-report measure of the frequency of sexual behaviors exhibited by children between the ages of two and 12.

Using the CSBI, Friedrich et al. (1998) report a set of "developmentally-related sexual behaviors" for normative samples of boys and girls across three age groups (p. 4).

To be defined in this way, a behavior must have been observed in at least 20% of a specific gender/age group during the previous six months. Among two-to-five-year-old boys and girls, these behaviors include standing too close to others, attempting to look at others who are undressed or undressing, touching or attempting to touch a woman's breasts, and touching one's own private/sex parts at home. Touching one's own sex or private parts in public is an additional developmentally-related behavior among boys in this age group. The developmentally-related sexual behaviors identified for the two older age groups do not reflect any gender differences. For six-to-nine-year-olds, these behaviors include trying to look at people who are undressing or naked and touching one's private or sex parts at home. Among 10-12-year-old children, demonstrating a high level of interest in the opposite sex is a developmentally-related behavior. Other common sexual behaviors among children of various ages have also been identified (See Hornor, 2004 for review). These include masturbation and exposing one's genitals to others among children ranging from toddlerhood to early school-age and discussion of sex, use of sexual language, viewing and touching other children's (of similar age) genitals, masturbation, drawing sex parts, looking at nude images, and asking about sex in school-aged children and early adolescents. Thus, it is apparent that the nature of children's sexual behaviors changes as they age, with behaviors relating to sexual interest becoming prominent as children approach puberty and other categories of behaviors declining in frequency (Friedrich et al., 1998).

In addition to the qualitative changes in sexual behavior that occur as children mature, developmental shifts in frequency have also been noted (Friedrich et al., 1998). Children's sexual behaviors are reported with increasing frequency between the ages of

two and five, followed by a decline. A second decrease in frequency occurs at age nine. Though these patterns are similar for both boys and girls, their behavioral tendencies diverge at age 11. At this point, girls demonstrate an increase in sexual behavior, while boys do not experience this change until age 12. For both genders, however, the increase in sexual behavior is primarily driven by interest in the opposite sex, consistent with the pubertal changes occurring around this time. The decline in reported frequencies of sexual behaviors as children age may be influenced by other aspects of child development. For instance, in young children, sexual behaviors such as masturbation may serve as coping mechanisms, resulting in higher rates of sexual behaviors (Grant & Lundeberg, 2009; White, Halpin, Strom, & Santilli, 1988, as cited in Chaffin et al., 2008). Increased impulsivity and lower levels of inhibition may also contribute to more frequent sexual behavior in younger children (Grant & Lundeberg, 2009). As noted by Gil (1993), school-aged children begin to demonstrate increased inhibition and a desire for privacy. Thus, since data on child sexual behaviors are obtained via parental reports, it is conceivable that parents are unaware of the true frequency of their older children's sexual behaviors, resulting in unreliable reports and spurious findings of age-related decreases in these behaviors (See Elkovitch et al., 2009; Grant & Lundeberg, 2009).

CHAPTER III

CHILD SEXUAL BEHAVIOR PROBLEMS

The concept of child sexual behavior problems first gained recognition in psychological literature in the late 1980s (Grant & Lundeberg, 2009). Since then, many more articles have been published on the subject, and a number of definitions and criteria for distinguishing between normative and problematic sexual behaviors have been proposed. For example, the ATSA Task Force on Youth with Sexual Behavior Problems defines children with sexual behavior problems as those "ages 12 and younger who initiate behaviors involving sexual body parts (i.e., genitals, anus, buttocks, or breasts) that are developmentally inappropriate or potentially harmful to themselves or others" (Chaffin et al., 2008, p. 200). The task force goes on to specify the meanings of the terms "inappropriate" and "potentially harmful." To evaluate the developmental appropriateness of sexual behaviors, the task force recommends that the child's stage of development, preoccupation with sex, responsiveness to adult intervention, and culture, as well as the behavior(s)'s frequency, be considered. To establish potential for harm, it is important to take into account differences in children's development and age when the behaviors involve more than one child; the use of coercion, force, or intimidation towards another individual; adverse emotional and/or physical consequences (e.g., injury or distress); and disruption of the child's social development.

Other authors have proposed alternative criteria for determining the problematic nature of sexual behaviors. For instance, Pithers, Gray, Cunningham, and Lane (1993, as cited in Grant & Lundeberg, 2009) suggest that assessments of children's sexual behavior consider whether or not the behavior is developmentally appropriate, the presence of secrecy regarding the behavior, obsessive or compulsive qualities of the behavior, the magnitude of power discrepancies between involved children, and whether or not intimidation or force were used. Other considerations include differences in the sizes and status of involved children, disruption of relationships or development, violation of social norms, and discomfort to others (Gil, 1993; see Offermann, Johnson, Johnson-Brooks, & Belcher, 2008 for review).

It is also important to note that problematic sexual behaviors can take a variety of forms, including self-focused behaviors and/or behaviors involving others (Chaffin et al., 2008). As previously alluded to, variation also exists among other-focused behaviors, specifically, with regard to risk of harm, mutuality versus coercion, and the specific behaviors involved. Though problematic behaviors can vary along these attributes, a particular set of features characterizes those behaviors that are most troubling. These include the use of force, aggression, or coercion; large differences in age or development; actual or potential harm; and more advanced sexual behaviors (Chaffin et al., 2008). Examples of problematic behaviors include developmentally-inappropriate sexual knowledge, repeated self-penetration, sex play involving penetration, oral-genital contact during sex play, imitation of sexual intercourse, requesting that an adult perform a particular sexual act, and coercive sexual acts or sexual interactions between children at least four years apart in age (See Hornor, 2004 and Kellogg, 2010 for review). Persistent

solitary sexual behaviors or those that lead to anxiety, emotional distress, or physical pain are also problematic (See Kellogg, 2010 for review). Though these behaviors are considered to be problematic for all preadolescent children, it is important to note that other sexual behaviors may be deemed appropriate or inappropriate on the basis of age or culture (Chaffin et al., 2008).

Prevalence of Sexual Behavior Problems

Despite increased attention to childhood sexual behavior problems, their prevalence in community samples remains unknown (Chaffin et al., 2008). Two primary factors are responsible for this dearth of information (See Pithers & Gray, 1998). First, the criteria used to identify sexual behavior problems lack clarity, resulting in inconsistent reporting and erroneous labeling of children's sexual behaviors. Though the vaguely described criteria may better allow for the consideration of contextual factors in the assessment of children's sexual behaviors, they may also permit too much subjectivity and interfere with the utility of the assessment process. A second difficulty in determining the prevalence of sexual behavior problems concerns the inability of most child protective services to investigate and maintain records on children who engage in sexual behavior problems, except when they are identified as potential victims of maltreatment.

Perhaps because of the availability of records of children who are subjected to maltreatment, estimates of the prevalence of children with sexual behavior problems in the child welfare system have been presented. Among children in foster care, 11-14% may exhibit problematic sexual behaviors, while this figure may be as high as 30-34% for children in residential treatment (Baker et al., 2002; Baker et al., 2008). Most recently,

Szanto, Lyons, and Kisiel (2012) reported that approximately 27% of a sample of youth in the Illinois child welfare system exhibited sexualized behaviors. Baker et al. (2008) also studied a normative (non-child welfare) comparison sample and reported that 12% of the youth in this group exhibited problematic sexual behaviors. The definition of problematic sexual behaviors varied somewhat across these studies. Baker et al. (2002) considered this term to apply to behaviors that caused problems for the children themselves, adults, or other children. Baker et al. (2008) employed a more objective criterion, requiring that children exhibit at least one intrusive behavior and/or have a clinically significant score on the items from the Child Sexual Behavior Inventory (Friedrich, 1997, as cited in Baker et al., 2008) known to be associated with a history of sexual abuse (i.e., the Sexual Abuse Specific Items). Szanto et al. (2012) classified children using a five-point rating scale ("no issues," "sexuality only," "sexually reactive only," "sexually aggressive only," "sexually reactive and aggressive;" p. 238). Another study (McCrae, 2009) reported a somewhat lower rate (9%) of sexualized behaviors among youth in the child welfare system. The fact that nearly all of the children in this sample remained at home at the time of the assessment may account for the somewhat lower prevalence rate, since youth who have not been taken into substitute care may be less likely to have severe behavioral problems leading to child welfare involvement and may have experienced less serious maltreatment, resulting in a decreased likelihood of problematic sexual behaviors. (See below for a discussion of the association between child maltreatment and sexual behavior problems.)

Children with Sexual Behavior Problems versus Adolescent and Adult Sex Offenders

Though some children with sexual behavior problems are viewed as sexually aggressive or abusive, it is critical to bear in mind that these children are not comparable to adolescents or adults who commit sexual offenses (Chaffin et al., 2008; Friedrich et al., 2003; Letourneau, Schoenwald, & Sheidow, 2004). In particular, even children who exhibit harmful or aggressive behaviors should not be prematurely labeled with terms such as "perpetrator" or "predator," especially in light of evidence suggesting that the vast majority of children with sexual behavior problems do not go on to commit sexual offenses (Chaffin et al., 2008, p. 212). For instance, a 10-year longitudinal study suggests that future reports or arrests for sexual offenses are rare among individuals who exhibit problematic sexual behaviors during childhood (Carpentier, Silovsky, & Chaffin, 2006).

Moreover, although children with sexual behavior problems and adolescent sex offenders share some common characteristics (e.g., a history of having been sexually abused), these groups are quite distinct, with the former exhibiting more heterogeneity than the latter (Chaffin et al., 2008; Letourneau et al., 2004). Specifically, while both boys and girls exhibit sexual behavior problems, sex offenders are primarily male. Moreover, inappropriate sexual behaviors appear to become less frequent as children age, whereas older adolescents tend to commit more severe offenses as they age, without any change in frequency (See Letourneau et al., 2004 for review). Children's experiences and attributes associated with sexual behavior problems will be addressed subsequently; however, as adolescent and adult sexual offenders are not the focus of the present study, they will not be discussed further.

Correlates of Sexual Behavior Problems

Cross-sectional studies have identified a number of attributes of children and their families that are associated with the occurrence of sexual behavior problems. Following the approach of Elkovitch et al. (2009), these various predictors can be organized within an ecological-transactional framework, in which factors can interact within and across proximal and distal domains in order to shape children's development (See Bronfenbrenner, 1979 and Cicchetti & Lynch, 1993, as cited in Elkovitch et al., 2009). This approach permits an analysis of correlates of child sexual behavior problems within hierarchical spheres of influence, including the characteristics of the child (e.g., age, mental health), microsystems (e.g., attributes of the child's family and neighborhood), and mesosystems, which consist of interactions among the child's various microsystems. At the child level, age appears to be a consistent predictor of children's behaviors, with younger children demonstrating higher levels of problematic sexual behaviors compared to older children (Friedrich et al., 2003; Gray, Busconi, Houchens, & Pithers, 1997). Among a sample of children identified as having sexual behavior problems, six-to-nine-year-old children were reported to engage in more sexual behavior than 10-to-12-year-old children (Gray et al., 1997). This effect was stronger among boys. Younger age has also been associated with the presence of intrusive sexual behaviors among children between the ages of two and 12, suggesting that these behaviors are partly the result of immaturity and reactivity to adversity, including abuse (Friedrich et al., 2003). Also at the child level, the association between gender and sexual behavior problems has been examined with ambiguous results. Though gender differences in the rates of problematic sexual behaviors are limited within community and outpatient samples of children, more boys

than girls are referred for treatment (See Elkovitch et al., 2009 for review). Within the child welfare system, there is conflicting evidence regarding the relative prevalence of sexual behavior problems in boys versus girls (See Szanto et al., 2012 and Tarren-Sweeney, 2008).

Other factors at the child level pertain to children's emotional, behavioral, social, and cognitive functioning. A number of studies have found that children with sexual behavior problems frequently demonstrate both internalizing and externalizing symptoms (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). Not only do children with these symptoms demonstrate higher levels of sexual behaviors (e.g., Friedrich et al., 2001), they also exhibit increased intrusive sexual behaviors in particular, such as touching another child's genitals (Friedrich et al., 2003). Based on the tendency for sexual behavior problems and externalizing symptoms to co-occur, it appears that sexual behavior problems may be only a single component of a more generalized disruptive behavior pattern (See Elkovitch et al., 2009). Specific diagnoses commonly associated with sexual behavior problems and intrusive sexual behaviors include attention-deficit hyperactivity disorder, oppositional defiant disorder, conduct disorder, adjustment disorder, and post-traumatic stress disorder (See Grant & Lundeberg, 2009). Sexual preoccupation likewise appears to be common among children exhibiting problematic sexual behaviors (See Grant & Lundeberg, 2009). Poor coping skills and impulsivity are also common among children with sexual behavior problems (See Swisher, Silovsky, Stewart, & Pierce, 2008). This finding is consistent with the fact that problematic child sexual behaviors are likely to be impulsive, as opposed to compulsive (Chaffin et al., 2008).

With regard to social competence, the association is less clear. As Grant and Lundeberg (2009) note, abusive and intrusive sexual behaviors are inherently indicative of interpersonal difficulties. Additionally, according to the ATSA task force (Chaffin et al., 2008), one of the criterion on which children's sexual behaviors can be evaluated is potential disruption of social development. Aside from these considerations, a number of studies have found evidence of social and interpersonal difficulties among children with sexual behavior problems (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009). These deficits include violations of interpersonal boundaries and the absence of developmentally-expected social skills. Conversely, however, one study (Friedrich et al., 2003) noted a positive association between children's social competence and their engagement in sexually intrusive behaviors. This finding may suggest that children possessed the social skills needed to gain access to others and demonstrate these behaviors. The association between children's cognitive functioning and sexual behavior problems remains somewhat unclear (Elkovitch et al., 2009). Though Friedrich and Luecke (1988) and Gray et al. (1997) found high rates of learning disabilities and participation in special education services among children with sexual behavior problems, another study found no difference between the cognitive functioning of children with sexual behavior problems and a control group (Bonner, Walker, & Berliner, 1999, as cited in Elkovitch et al., 2009).

At the microsystem level, there are numerous factors related to children's sexual behavior problems. Among these, perhaps the most prominent is a history of sexual abuse (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). A review of studies of child sexual abuse found that 7-90% of children who experience sexual abuse later

exhibit inappropriate sexual behavior (Kendall-Tackett, Williams, & Finkelhor, 1993). More recently, Gray, Pithers, Busconi, & Houchens (1999) reported that 78% of the boys and 93% of the girls in their sample of children with sexual behavior problems had been sexually abused. Children who have been sexually abused also exhibit higher levels of sexual behaviors compared to community and psychiatric outpatient comparison groups (Friedrich et al., 2001). Though the mediators of the association between sexual abuse and subsequent sexual behavior problems are not well understood (Elkovitch et al., 2009), Grant and Lundeberg (2009) draw upon a model of sexually intrusive behavior proposed by Friedrich et al. (2003) to point to the potentially traumatic effects of this type of modeling of sexuality, which may lead to sexualization or sexual preoccupation. Traumatic sexualization appears to contribute to a number of consequences of sexual abuse, including developmentally inappropriate sexual interest and knowledge and repetitive sexual behaviors (See Finkelhor & Browne, 1985 for review).

Other forms of maltreatment have also been associated with sexual behavior problems. Physical abuse, emotional abuse, and neglect are frequently reported among youth with sexual behavior problems, and physical abuse has been positively associated with the severity of children's sexual behaviors (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). Many children (56%) with sexual behavior problems have experienced more than one type of abuse (Gray et al., 1999). Again drawing upon the model suggested by Friedrich et al. (2003), Grant and Lundeberg (2009) discuss the modeling of coercion that may occur when children are subjected to physical abuse. Modeling of coercion is also relevant to the association between sexual behavior problems and exposure to domestic and community violence (See Grant & Lundeberg,

2009 and Swisher et al., 2008 for review). Notably, Elkovitch (2010) failed to find an association between children's sexual behaviors and community violence exposure; however, she acknowledges the potential for interactions between this and other risk factors to contribute to problematic sexual behaviors. Domestic violence has also been specifically associated with intrusive sexual behavior in children (Friedrich et al., 2003). Traumatic experiences are also associated with sexual behavior problems (Chaffin et al., 2008; see Swisher et al., 2008).

The remaining correlates of child sexual behavior problems pertain to children's home and family environments. Following Friedrich et al.'s (2003) conceptualization, modeling of sexuality is a pertinent factor in children's sexual behaviors (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). Specifically, Friedrich and colleagues (1991, 1992, 1998, 2001) found positive associations between children's sexual behaviors and sexuality within the home, such as exposure to pornography and sexual behavior, nudity, co-bathing, and co-sleeping. Exposure to stressful events, including the death of an immediate relative or parental divorce, is associated with a greater likelihood of sexual behavior problems in general and of intrusive sexual behaviors in particular (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). Lower family income is also associated with an increased frequency of intrusive sexual behaviors in children (Friedrich et al., 2003). Finally, parenting factors appear to be relevant to sexual behavior problems (Pithers et al., 1998; see Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). Children from single-parent homes may be at greater risk for sexual behavior problems, perhaps due to factors such as the increased risk of financial strain, limited parental supervision and availability, and the negative

emotional ramifications of an absent parent (See Grant & Lundeberg, 2009). Lack of parental support following sexual abuse, poor parent-child relationships and attachment, and compromised parental abilities to care for their children (e.g., due to mental illness) may also contribute to sexual behavior problems (See Grant & Lundeberg, 2009; Pithers et al., 1998). Furthermore, Pithers and colleagues' (1998) longitudinal research suggests that treatment for sexual behavior problems may be more effective for children whose parents report greater attachment to them. On the other hand, negative parent-child relationship qualities associated with sexual behavior problems may contribute to lower levels of parental support and monitoring of children (Elkovitch et al., 2009).

Though an analysis at the mesosystem level would promote understanding of the ways in which children's proximal environments may interact to influence their sexual behaviors, the dearth of knowledge pertaining to systems beyond the home and family (Elkovitch et al., 2009) hinders this process. The extant research does, however, point to possible interactions between the microsystem and individual child characteristics. For instance, though parental support appears to affect the emergence of sexual behavior problems among children who have been sexually abused, this relationship may vary depending on children's ages (See Elkovitch et al., 2009 for review). As another example, conflicting findings regarding the association between sexual behavior problems and children's cognitive functioning (See Elkovitch et al., 2009, Friedrich & Luecke, 1988, and Gray et al., 1997) suggest that cognitive functioning may be relevant to the development of sexual behavior problems only under certain circumstances. However, little is currently known about the manner in which various factors interact to cause sexual behavior problems. Grant and Lundeberg (2009)'s statement that no one

factor can best account for sexual behavior problems highlights the necessity of future work in this area.

CHAPTER IV

CULTURE AND CONTEXT IN RELATION TO CHILDREN'S SEXUAL BEHAVIORS

The importance of context in the assessment of child sexual behavior must not be overlooked (Friedrich, Sandfort, Oostveen, & Cohen-Kettenis, 2000; Thigpen, 2009; Thigpen & Fortenberry, 2009). In particular, previous studies have identified cross-cultural variation in sexual behavior and attitudes towards sexuality (See Friedrich et al., 2000 for review). Additionally, several studies (e.g., Baker et al., 2002; Baker et al., 2008; Szanto et al., 2012; Tarren-Sweeney, 2008) examine sexual behavior problems within the child welfare system. These two important contexts and their relationships to normative and problematic child sexual behavior will be discussed in the following sections.

Cultural Variation in Normative Child Sexual Behavior

To explain the role of context and culture in the development of children's sexuality, Thigpen and Fortenberry (2009) employ the theory of social constructionism (Berger & Luckmann, 1966, as cited in Thigpen & Fortenberry, 2009). Social constructionism argues that reality is a socially constructed product of shared meanings and social interactions. Thus, while sexuality has a biological basis, the manner in which it develops and manifests itself in individuals is influenced by contextual factors,

including culturally determined perspectives on sexual behavior (Thigpen & Fortenberry, 2009).

The literature on child sexual behaviors has identified several examples of cross-cultural differences. For instance, a study of American and Swedish children between the ages of three and six found that parents of Swedish children typically reported higher levels of child sexual behavior than American parents did (Larsson, Svedin, & Friedrich, 2000). These differences were more substantial among boys than girls. Despite the differences in prevalence, however, the most common behaviors were similar in each country. These included exhibitionistic and voyeuristic behaviors, as well as behaviors involving touching oneself or another person. Likewise, parental reports of sexually explicit or intrusive behaviors (e.g., asking another person to participate in a sex act) were quite rare in both Sweden and the United States. Furthermore, family sexuality, an established correlate of child sexual behavior (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review), was positively associated with parents' reports in both countries. Thus, given the role of familial and cultural responses and attitudes towards children's sexuality, Larsson et al. (2000) suggest that differences in American versus Swedish positions on sexuality may be responsible for the study's findings.

A similar study compared Dutch and American children between the ages of two and six (Friedrich et al., 2000). Reports from the children's mothers indicated that many of the 25 sexual behaviors that were assessed were more common among the Dutch children. Consistent with the findings of Larsson et al. (2000), family sexuality was positively correlated with the frequency of children's sexual behaviors, providing further evidence for this construct as a cross-culturally valid predictor of such behaviors.

Additionally, gender differences in the frequency of various sexual behaviors were similar among the American and Dutch children. Overall, Friedrich et al. (2000) highlight the presence of both similarities and differences in normative sexual behaviors in the two cultures. In light of established differences in Dutch versus American attitudes towards sexuality, it is possible that this study's findings reflect differences in parental responses to children's sexual behaviors and the ways in which children are socialized regarding their bodies and sexuality, both of which may lead to actual differences in sexual behaviors (Friedrich et al., 2000). Alternatively, apparent differences in frequency of behaviors may be a consequence of cultural differences in reporting styles, with Dutch mothers responding more candidly as a result of their greater leniency towards sexuality (Friedrich et al., 2000).

A retrospective study (Larsson & Svedin, 2002) of Swedish students' reports of their childhood sexual behaviors provides further evidence of cultural variation. Though all participants lived in Sweden, differences emerged in the reports of native Swedish individuals compared to those of children whose parents were immigrants. Thus, it appears that cultural differences in sexual behaviors are present both within and between nations and geographic settings.

Despite the apparent importance of culture and context in influencing children's sexual development, most studies of children's sexual behavior in the United States have included primarily middle-class, Caucasian samples (Thigpen, 2009). In light of established differences in sexual behavior among people of different ethnic backgrounds, this practice is clearly problematic (See Thigpen, 2009 for a review of differences in the sexual behaviors of African-American versus Caucasian adolescents and adults). Thigpen

et al. (2003) argue that the lack of knowledge regarding normative sexual behaviors among African-American children may have adverse effects due to inappropriate labeling of these children as sexually aggressive. Specifically, Thigpen et al. (2003) pose this concern in response to the practices of the Illinois Department of Children and Family Services' Sexually Aggressive Children and Youth (SACY) program. As they explain, the SACY program purports to determine the aggressive or problematic nature of children's sexual behaviors via comparisons to age-appropriate norms, yet knowledge of normative sexual behavior among African-American children is decidedly inadequate. To address this limitation, Thigpen (2009; Thigpen et al., 2003; Thigpen & Fortenberry, 2009) studied sexual behavior in a community sample of low-income, African-American children in Cook County, Illinois.

Thigpen's (2009; Thigpen et al., 2003; Thigpen & Fortenberry, 2009) findings are indicative of both similarities and differences in the sexual behaviors of African-American and Caucasian children. Primary caregivers reported that their children exhibited a wide variety of behaviors representing each of the nine categories of sexual behaviors defined by Friedrich et al. (1991). The most commonly observed types of behaviors in this sample included self-stimulation, voyeuristic behaviors, interest in the opposite sex, and boundary violations (Thigpen, 2009). There were no reports of behaviors in which children planned or asked for others to engage in sexual acts or forced them to do so. Gender differences were observed within the sample, with caregivers reporting observations of a greater number of different sexual behaviors in boys than among girls and some behaviors appearing much more frequently among boys. Overall

rates of sexual behaviors were not higher among boys compared to girls, however (Thigpen, 2009).

Age-related changes in the frequency of children's sexual behaviors were also noted. Compared with the youngest age group (ages two to five), children between the ages of six and nine and 10 and 12 were reported to exhibit a more limited range of sexual behaviors (Thigpen, 2009). Within each age group, Thigpen (2009) identified a category of sexual behaviors that he suggests may be related to the child's phase of development. These categories consist of boundary violations among two-to-five-year-olds, voyeuristic behaviors in six-to-nine-year-olds, and sexual interest among 10-12-year-olds. A comparison of these findings with the developmentally-related behaviors defined by Friedrich et al. (1998) reveals the redundancy between them, suggesting that the age-related progression of sexual behaviors is quite similar across African-American and Caucasian children. An examination of age-related differences in overall frequency of sexual behaviors points to a different conclusion, however. Like Friedrich and colleagues (1998), Thigpen (2009) found that caregivers reported a decline in the frequency of children's sexual behaviors between ages five and nine. Whereas Friedrich et al. (1991, 1998) found that this pattern generally continued, the 10-12-year-old children in Thigpen's (2009) sample exhibited a clear increase in the frequency of their sexual behaviors. Greater interest in the opposite sex can partly account for this increase. Thigpen (2009) suggests that the discrepant findings for this oldest age group may be due to differences in the racial composition of the two samples. Because African-American children tend to mature physically at earlier ages compared to other groups, a number of the children in Thigpen's (2009) sample may have already reached puberty, resulting in

biological differences as well as increased awareness of the children's sexuality on the part of their caregivers.

Thigpen (2009) also proposes that caregivers' reports of children's sexual behaviors may have been influenced by racial factors. Specifically, concerns regarding the perception of African-Americans as excessively sexual and a cultural directive to avoid overt discussions of sexuality may have led participants to downplay their children's sexual behaviors. Consistent with this proposal, Thigpen et al. (2003) noted that the rates of sexual behaviors reported in their sample were low compared with those in normative samples of primarily middle-class, Caucasian children (e.g., Friedrich et al., 1991; Friedrich et al., 1998), perhaps as a result of conservative views regarding sex. Furthermore, the notion that caregiver attitudes towards sexuality may influence actual or reported frequencies of children's sexual behaviors (Friedrich et al., 1992; Friedrich et al., 1998) is supported by Thigpen and Fortenberry's (2009) finding that caregivers who reported acceptance of co-sleeping and a belief in the normalcy of sexuality in children were more likely to report that their children engaged in sexual behaviors. These results are consistent with those of Larsson et al. (2000) and Friedrich et al. (2000), who report that family sexuality is positively associated with parental reports of children's sexual behaviors.

Thus, a comparison of Thigpen's (2009; Thigpen et al., 2003; Thigpen & Fortenberry, 2009) findings regarding normative sexual behavior among low-income, African-American children with the results of Friedrich et al. (1991, 1998) pertaining to mostly Caucasian, middle-class children suggests broad similarities and limited racial differences. It is nonetheless important to establish a knowledge base regarding norms for

child sexual behaviors across a range of ethnic and racial groups in order to enhance decision-making in fields such as mental healthcare and the child welfare system (Thigpen, 2009; Thigpen & Fortenberry, 2009). As Thigpen (2009) notes, the study of African-American children is of particular importance due to their overrepresentation in these sorts of systems, as in the child welfare sample included in the present study (See Knott & Giwa, 2012 for a review of the disproportionate numbers of African-American youth in foster care). If children's behaviors are to be evaluated appropriately and accurately labeled as normal or problematic, there needs to be empirical data upon which to base such decisions.

Sexual Behavior Problems in the Child Welfare System

Though sexual behavior problems appear both within community samples and among youth involved in the child welfare system, because the present study pertains to the latter group, it is valuable to consider the reasons for studying sexual behavior problems in this population. First, child welfare agencies identify child sexual behavior problems as a significant issue (Baker et al., 2002). In particular, a survey of child welfare agencies in New York City indicated that half of agencies providing group care viewed children's sexual behavior problems as significant concerns, while an even larger number reported that the problem had worsened during the previous five years (Baker et al., 2002).

Another reason for studying problematic sexual behaviors within the child welfare system concerns the high percentage of children exhibiting such behaviors who are involved in this system (Baker et al., 2002). In some cases, events leading to a child's removal from his or her home and placement in substitute care may contribute to the

development of sexual behavior problems, while in other instances, the identification of children's problematic sexual behaviors may precipitate removal from their homes (Baker et al., 2002). For example, consistent with the correlates of sexual behavior problems discussed above, Baker and colleagues (2002) note that impulsivity can contribute both to removal of a child from his or her home and to sexual behavior problems. Furthermore, as previously discussed, children's experiences of abuse and neglect are associated with the emergence of sexual behavior problems (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). As most children in foster care have been subjected to maltreatment of some form (See Oswald, Heil, & Goldbeck, 2010 and Pecora, Roller White, Jackson, & Wiggins, 2009 for review), it is logical to study sexual behavior problems within the child welfare system.

Finally, problematic sexual behaviors interfere with the child welfare system's goals of safety and permanency for children (Baker et al., 2002; Baker et al., 2008). With regard to safety, children who exhibit sexual behavior problems create potentially harmful environments for other children in care (Baker et al., 2002; Baker et al., 2008). Direct adverse effects on others occur when youth with sexual behavior problems make other children the targets of their coercive or abusive sexual behaviors. Indirect effects arise when children engage in sexual behaviors in front of other children in care, triggering fears and memories of prior trauma (Baker et al., 2002). Though perhaps less obvious, children's sexual behavior problems also place them at risk by making them vulnerable to victimization (Baker et al., 2002; Baker et al., 2008). Threats to the goal of permanency arise due to placement disruptions. Particularly when other children are present, foster and adoptive parents may be unwilling to care for youth with problematic

sexual behaviors (Baker et al., 2002; Baker et al., 2008). Specifically, Baker and colleagues (2002) found that over half of the child welfare agencies surveyed claimed that sexual behavior problems resulted in disrupted adoptions, while 81% reported requests for children to be removed from foster homes due to their sexual behaviors. Due to these placement disruptions, children with problematic sexual behaviors were more likely to experience multiple placements while in care; multiple placements have been linked to poor outcomes for children (Baker et al., 2002). Thus, it is clear that childhood sexual behavior problems are of significant concern within the child welfare system, making this an ideal context within which to study this topic.

Having established the relevance of sexual behavior problems to youth in the child welfare system, it is helpful to consider the predictors of such behavior problems within this population. Tarren-Sweeney (2008) examined sexual behavior problems among a sample of Australian children in foster or kinship care. Not surprisingly, children who had experienced contact sexual abuse were reported to exhibit higher levels of sexual behaviors. Placement instability also predicted sexual behavior problems, though in light of Baker and colleagues' (2002) findings, it is unclear whether disruptions in placements were a cause or a consequence of children's sexual behaviors. Newton, Litrownik, and Landsverk (2000) found a bidirectional relationship between behavior problems and placement disruptions, suggesting that changes in placement within Tarren-Sweeney's (2008) sample may have both contributed to and been the result of the children's problematic sexual behaviors. Children who were older when they first entered foster or kinship care also exhibited more sexual behaviors; this predictor may be a proxy for duration of maltreatment (Tarren-Sweeney, 2008). Finally, contrary to Friedrich et

al.'s (2003) finding of the absence of gender differences in sexual behavior problems, within the foster care sample, girls were more likely than boys to exhibit problematic sexual behaviors. Tarren-Sweeney (2008) suggests that this finding may reflect bias in the measure used to assess sexual behaviors (which differed from that used by Friedrich et al., 2003), or it may be indicative of differences in foster care boys' and girls' responses to adversity. Tarren-Sweeney's (2008) findings differ from those reviewed above in other ways as well. Specifically, neither physical abuse nor exposure to parental violence was associated with children's sexual behavior problems in this sample. These results may be influenced by the cultural context of the study (i.e., It was conducted in Australia), or they may be idiosyncratic.

A more recent study of a child welfare sample in Illinois (Szanto et al., 2012) is only partly consistent with Tarren-Sweeney's (2008) results. Specifically, Szanto et al. (2012) reported higher rates of problematic sexual behaviors among boys rather than girls. They also found that sexual abuse, physical abuse, community violence, school violence, and observation of criminal activity were associated with an increased risk of sexual behavior problems. Conversely, family violence predicted a lower likelihood of problematic sexual behaviors. Additionally, rates of problematic sexual behaviors increased along with the number of traumas children experienced. Taken together, the results of these studies suggest a need for further examination of the correlates of sexual behavior problems among youth in the child welfare system. While the predictors of sexual behavior problems in normative samples may be applicable to youth in the child welfare system, the distinct histories and circumstances of these children demand that the possibility of unique correlates be examined as well.

CHAPTER V

TREATMENT AND COURSE OF CHILD SEXUAL BEHAVIOR PROBLEMS

Though a number of studies have examined child sexual behavior problems cross-sectionally, far fewer have taken a longitudinal approach to the subject. Longitudinal studies of this topic are of great importance, however. There is evidence that some adult sexual offenders exhibited sexual behavior problems as children; however, this does not suggest that child sexual behavior problems are necessarily indicative of future sexual misconduct (Chaffin et al., 2008). In fact, one study found that depending on treatment type, only 2-10% of children with sexual behavior problems were arrested or reported for a sexual offense over the next 10 years (Carpentier et al., 2006). By comparison, 3% of children in an outpatient clinic without sexual behavior problems were later found to have committed a sexual offense. Thus, it appears that though the majority of children with sexual behavior problems do not develop into sex offenders, a small minority do. It remains unclear, however, what attributes define the children who compose this latter group. Furthermore, there is concern that without treatment, sexual behavior problems will persist, yet little is known about the factors that differentiate temporary problems from long-term behavioral issues (Friedrich et al., 2003; Lévesque et al., 2012). Therefore, longitudinal studies can play an important role in determining which children are at greatest risk for future problems and identifying specific targets for intervention.

Treatment of Sexual Behavior Problems

At this time, the majority of longitudinal studies of child sexual behavior problems are treatment studies. Because children's cognitive, emotional, and social development is incomplete, treatment approaches developed for adult sex offenders, such as discussion of cycles of sexual behaviors, are generally not suitable for young children (Chaffin et al., 2008; Grant & Lundeberg, 2009). In fact, a recent meta-analysis of treatment for child sexual behavior problems found that relapse prevention, assault cycle, and arousal reconditioning strategies, all of which are used to address sex offending in adults and adolescents, were not beneficial in reducing child sexual behaviors (St. Amand, Bard, & Silovsky, 2008).

Based on its review of treatment studies of sexual behavior problems, the ATSA task force (Chaffin et al., 2008) concludes that in most cases, relatively brief, outpatient cognitive-behavioral therapy (CBT) is the treatment of choice for child sexual behavior problems. The review suggests that CBT has both short- and long-term effects and is superior to less structured approaches such as supportive or play therapy, as well as to a waitlist control. In fact, the results of the previously mentioned 10-year study by Carpentier et al. (2006) suggest that CBT is sufficiently effective as to decrease the risk of future sexual offending to the level observed in children with no history of sexual behavior problems. Previous research using the larger dataset on which the current study is based found that sexual behaviors decreased over time in children whose treatment providers endorsed a cognitive-behavioral orientation, while behaviors increased somewhat when providers did not endorse this theoretical orientation (Sieracki et al., 2008). In determining the optimal treatment approach, however, it may be necessary to

consider the attributes of the particular child in question. A study comparing two approaches, expressive therapy and relapse prevention-based treatment modeled after adult sex offender interventions, found that treatment effectiveness varied across child type (as indicated by an empirically-derived typology of children with sexual behavior problems; Pithers et al.,1998). These findings suggest the importance of considering both treatment elements and child attributes, an approach for which Chorpita and Daleiden (2009) advocate. Though sexual behavior problems are often addressed through group treatments, Chaffin et al. (2008) report that individual treatment is effective as well: According to the ATSA task force, treatment modality is of secondary importance relative to the approach to treatment.

In order to maximize treatment effectiveness, children's caregivers, including both natural and foster parents, must be included (See Chaffin et al., 2008 and St. Amand et al., 2008). The extent of caregiver involvement varies, from interventions that rely on caregivers to assist in treatment facilitation to interventions whose focus is primarily parent behaviors (e.g., parent skill training; Chaffin et al., 2008). Caregiver involvement is important for ensuring that treatment plans are effectively executed and in some cases, may be important for altering problematic family environments that contribute to children's behavior problems (Chaffin et al., 2008). The aforementioned meta-analysis of treatment for child sexual behavior problems identified four parent-focused treatment components that appeared to be effective: parenting/behavior management skills, sex education, rules about sexual behavior, and abuse prevention (St. Amand et al., 2008).

When examining the effectiveness of mental health treatments, it may be most appropriate to consider individual treatment strategies, as opposed to multifaceted

treatment protocols or theoretical orientations (Chorpita & Daleiden, 2009). The ATSA task force (Chaffin et al., 2008) also reported a list of child and caregiver treatment components found across a number of effective cognitive-behavioral treatments for sexual behavior problems. For children, these include addressing the inappropriate nature of children's sexual behaviors and having them apologize, instruction and practice regarding rules for physical boundaries and sexual behavior, development of social skills, instruction in safety and prevention of sexual abuse, development of self-control and coping strategies, and sex education. Consistent with this list, St. Amand et al. (2008) report that instruction in self-control skills as a component of child treatment predicts treatment effectiveness. For caregivers, effective treatment includes the development and enactment of a safety plan, information about normative sexuality versus sexual behavior problems, techniques for promoting children's compliance with sexual behavior and privacy rules, education regarding sexual behavior problems and assistance in maintaining an appropriate environment, sex education, parenting strategies, efforts to enhance relationships with children, and guidance in promoting children's involvement with supportive peers and use of newly acquired self-control techniques (Chaffin et al., 2008).

Longitudinal Studies

In addition to the treatment studies summarized above, there is a small number of naturalistic longitudinal studies of child sexual behavior problems, all of which were conducted within the child welfare system. The first of these studies (Friedrich et al., 2005) examined the persistence of "problematic sexualized behaviors" over 12 months in a sample of 10-12-year-old children in residential treatment or foster boarding homes (p.

391). Children were classified as demonstrating problematic sexualized behaviors if they were reported to demonstrate at least one intrusive behavior on the CSBI or if they scored in the clinical range on the Sexual Abuse Specific Items. The results suggest that sexual behavior problems are relatively stable over the course of a year, particularly for children in residential treatment centers. Specifically, 92% of children in residential treatment identified as exhibiting problematic sexualized behaviors at the start of the study also met the criteria at the second time point. Similarly, 85% of children without sexualized behavior problems at time 1 still did not meet criteria after 12 months. Among children in foster boarding homes, only 43% of children with problematic sexualized behaviors continued to exhibit these behaviors after one year. This level of continuity was not statistically different from chance. In contrast, of the children in foster boarding homes who were not initially classified as having problematic sexualized behaviors, 83% continued to be free of these behaviors at time 2.

In considering the greater degree of persistence of sexual behaviors among the residential group, Friedrich et al. (2005) suggest that children's placement in a residential treatment center may have contributed to the development or maintenance of their sexual behaviors. They also suggest that the greater persistence of sexual behaviors among youth in residential treatment may be due to these children having more severe mental health problems compared to children in foster boarding homes. However, as this study did not include measures of children's overall mental health, it is not possible to determine the validity of this explanation. Additional limitations of this study include the dichotomous classification of children, which limits the ability to identify changes in children's sexual behaviors; the absence of other measures (such as child symptoms and

functioning); and the failure to consider treatment effects, despite the fact that many of the children were participating in treatment that may have addressed their sexual behavior problems (Friedrich et al., 2005). Thus, while this study represents an important initial effort at understanding changes in children's sexual behaviors, it lacks the details needed to understand the circumstances under which children's sexual behaviors persist or improve.

A subsequent study of a national sample of youth in the child welfare system reported that 9% of youth up to age 14 demonstrated clinically significant sexual behavior (McCrae, 2009). At three-year follow-up, an additional 2% of children were reported to have sexual behavior problems, while only 17% of children with sexual behavior problems at the start of the study continued to exhibit problems in this area. These findings are consistent with the ATSA task force's conclusion that sexual behavior problems tend to decline over time (Chaffin et al., 2008). The fact that the majority of the children in McCrae's (2009) sample were living at home at the start of the study may also contribute to the discrepancy between these findings and those of Friedrich and colleagues (2005), whose sample may have been more clinically severe and/or may have experienced iatrogenic effects of residential treatment.

Most recently, Lévesque et al. (2012) expanded upon Friedrich et al.'s (2005) work by examining child and family predictors of persistence of sexual behavior problems in a Canadian sample of four-to-11-year-old children in the child welfare system. They found that younger age and increased exposure to sexuality in one's family (including exposure to pornography) were associated with persistence of sexual behavior problems one year later. Concurrent predictors of persistent sexual behavior problems

included both of the aforementioned predictors, along with somatic symptoms and externalizing problems. Neither gender nor experience of maltreatment was related to the persistence of sexual behavior problems. Like the previous study by Friedrich et al. (2005), this study was limited by its conceptualization of sexual behavior problems as a dichotomous outcome as well as the lack of information regarding treatment and the sole reliance on caregiver report. Additional limitations include the small sample size and lack of interaction terms in the regression analyses.

Limitations of Prior Research

As the preceding review suggests, the extant literature pertaining to child sexual behavior problems suffers from a number of limitations. The majority of the studies conducted thus far have been cross-sectional; thus, little is known about the course and persistence of problematic sexual behaviors. Furthermore, with one exception (i.e., Pithers et al., 1998), the few longitudinal studies either focus exclusively on treatment without attending to child and environmental characteristics or fail to assess involvement in treatment and its possible benefits for children. There is a need to combine these two approaches in order to understand the circumstances under which various treatment components are beneficial. Furthermore, those studies that have examined child attributes (Pithers et al., 1998; Lévesque et al., 2012) associated with changes in sexual behavior problems failed to assess potential interactions among predictors, though Pithers and colleagues (1998) did consider outcome differences for various pairings of child types and treatment types.

An additional limitation concerns operational definitions of sexual behavior problems used in previous studies. In spite of the diverse and somewhat abstract criteria

used to define this concept (See Chaffin et al., 2008; Gil, 1993; Offermann et al., 2008; Pithers et al., 1993, as cited in Grant & Lundeberg, 2009), some researchers (i.e., Friedrich et al., 2005; Lévesque et al., 2012) have conceptualized it dichotomously, classifying children based on items of the CSBI without regard to context. This approach compromises the ability to examine changes in children's sexual behaviors, which may increase or decrease slightly, as well as undergo qualitative changes that may not be captured by a dichotomous outcome measure (See Friedrich et al., 2005).

Additionally, previous research (with the exception of treatment studies that incorporate therapist reports) has typically relied on a single-informant approach in which parents or caregivers provide data on themselves, their families, and children and their behaviors. Thus, with few exceptions (e.g., Pithers et al., 1998), previous studies have not included child reports regarding themselves or their families. Finally, as previously discussed, most studies of children's sexual behaviors have included primarily Caucasian youth, indicating a need to examine both normative and problematic sexual behavior within other racial groups as well (Elkovitch et al., 2009).

Summary and the Present Study

In summary, knowledge of children's normative and problematic sexual behaviors has expanded greatly in recent years, yet a number of gaps remain in this literature. Prior research suggests that it is typical for preadolescent children to demonstrate a variety of sexual behaviors, though the specific nature of these behaviors differs based on age, gender, and cultural factors (e.g., Friedrich et al., 1991; Friedrich et al., 1998; Thigpen, 2009; Thigpen et al., 2003). Additionally, some children, particularly within the child welfare system (See Baker et al., 2002), are said to demonstrate sexual behavior

problems. Such maladaptive behaviors have been associated with a number of variables pertaining to children's characteristics; exposure to violence and sexuality; family environments; and cognitive, emotional, and psychological functioning (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). Longitudinal research has also begun to identify predictors of persistence of children's sexual behavior problems (Lévesque et al., 2012). Additionally, treatment studies have demonstrated a number of techniques, particularly cognitive-behavioral approaches, that are effective in ameliorating problematic sexual behaviors (See Chaffin et al., 2008 and St. Amand et al., 2008 for review).

The present study will use a longitudinal approach to identify predictors of improvement and worsening of sexual behavior problems (as indicated by the reliable change index; Jacobson & Truax, 1991) among youth in the child welfare system. This study will also address several of the limitations identified above. First, multiple sources of data, including caregiver, therapist, and child self-report, along with DCFS file reviews, will be included. Additionally, unlike the majority of extant longitudinal studies of sexual behavior problems, both treatment dimensions and various child and environmental attributes will be assessed, rather than one or the other. Furthermore, unlike in previous studies, changes in a number of predictors representing children's functioning (e.g., social and emotional competence, internalizing and externalizing symptoms, trauma symptoms, and coping and emotion regulation) and family relationships (positive parenting) will be included as predictors of changes in children's sexual behaviors. Because the present study focuses on changes in sexual behaviors as an outcome, it is important to assess the significance of changes in other domains as

predictors; such changes are expected to be the strongest predictors. Previous research with a sample of foster care youth also found that change scores were better predictors than time 1 values of remission of mental health problems (Dunleavy, 2010).

The present study also uses a larger sample and a broader age range compared to some previous longitudinal studies of youth in child welfare (i.e., Friedrich et al., 2005; Lévesque et al., 2012), allowing for an enhanced understanding of the effects of age on changes in sexual behavior problems. Additionally, by using statistically reliable change in children's sexual behaviors, rather than somewhat arbitrary classifications, as an outcome measure, this study may be able to better identify somewhat subtle, yet meaningful, changes in these behaviors. Finally, the use of Classification Tree Analysis via Optimal Data Analysis (ODA; Soltysik & Yarnold, 1993; Yarnold & Soltysik, 2005) as a statistical approach will permit an evaluation of potential interactions among predictors and the identification of distinct subgroups of children whose behaviors improve, worsen, or remain stable over time. As discussed in greater detail below, the large number of predictors examined in this study and the experimental approach to examining interactions among the independent variables make ODA an ideal statistical approach to addressing the present research question.

Though the participants included in this study were screened into the Illinois Department of Children and Family Services' program for Sexually Aggressive Children and Youth (SACY), it is important to establish the clinical severity of this sample, particularly in light of the concerns raised by Thigpen et al. (2003) regarding the SACY program's criteria for inclusion. Thus, on the basis of CSBI scores, the severity of sexual behavior in the present sample was compared to four other groups: Friedrich et al.'s

(2001) primarily Caucasian normative, psychiatric, and sexual abuse samples and Thigpen's (2009; Thigpen & Fortenberry, 2009) sample of low-income African-American children in Cook County, IL. As reported below, the mean score in this sample exceeds that even of children who have been sexually abused and is substantially higher than that of the normative African-American and primarily Caucasian samples. Thus, despite a great deal of variation in CSBI scores within the current sample, it is clear that as a whole, they exhibited sexual behaviors well beyond what is developmentally expected.

Hypotheses

The existing literature suggests a number of predictors of decreases versus stability or increases in children's sexual behaviors. Though the aim of the present study is to identify interactions among these predictors through the use of ODA, as already noted, previous studies have largely ignored the issue of interactions. Therefore, the following hypotheses will focus on main effects generated by the univariate ODA analyses and not on the final multivariate model (See Figures 1 and 2):

1. Child characteristics

    a. Younger age will predict a decrease in sexual behaviors.

    b. Female gender will predict no change or an increase in sexual behaviors.

2. Maltreatment history

    a. Prior experience of the following types of maltreatment will predict no change or an increase in sexual behaviors: physical abuse, serious physical abuse, neglect, physical neglect, sexual abuse.

b. Prior experience of both physical and sexual abuse will predict no change or an increase in sexual behaviors.

c. Prior experience of a greater number of types of maltreatment will predict no change or an increase in sexual behaviors.

3. Child welfare history

a. Fewer total child welfare placements at time 1 will predict a decrease in sexual behaviors.

4. Child functioning

a. Cognitive functioning

i. Higher levels of intelligence at time 1 will predict a decrease in sexual behaviors.

b. Internalizing symptoms

i. Higher levels of the following types of internalizing symptoms at time 1 will predict no change or an increase in sexual behaviors: anxiety symptoms, psychosomatic symptoms.

ii. A decrease in the following types of internalizing symptoms from time 1 to time 2 will predict a decrease in sexual behaviors: anxiety symptoms, psychosomatic symptoms.

c. Externalizing symptoms

i. Higher levels of the following types of externalizing symptoms at time 1 will predict no change or an increase in sexual behaviors: conduct problems, impulsive-hyperactive behaviors, hyperactivity.

ii. A decrease in the following types of externalizing symptoms from time 1 to time 2 will predict a decrease in sexual behaviors: conduct problems, impulsive-hyperactive behaviors, hyperactivity.

d. Trauma symptoms

i. Higher levels of the following trauma symptoms at time 1 will predict no change or an increase in sexual behaviors: anxiety, depression, posttraumatic stress, sexual concerns.

ii. A decrease in the following trauma symptoms from time 1 to time 2 will predict a decrease in sexual behaviors: anxiety, depression, posttraumatic stress, sexual concerns.

e. Coping skills and emotion regulation

i. Higher levels of coping skills and emotion regulation at time 1 will predict a decrease in sexual behaviors.

ii. An increase in coping skills and emotion regulation ability from time 1 to time 2 will exhibit a decrease in sexual behaviors.

f. Social/emotional competence

i. Children with higher levels of social/emotional competence at time 1 will exhibit a decrease in sexual behaviors.

ii. An increase in social/emotional competence from time 1 to time 2 will predict a decrease in sexual behaviors.

5. Exposure to sexuality

a. Greater exposure to sexuality at time 1 will predict no change or an increase in sexual behaviors.

6. Exposure to violence

    a. Exposure to physical conflict

        i. Greater exposure to physical conflict at time 1 will predict no change or an increase in sexual behaviors.

    b. Exposure to community violence

        i. Greater exposure to community violence at time 1 will predict no change or an increase in sexual behaviors.

7. Parenting

    a. Higher levels of positive parenting at time 1 will predict a decrease in sexual behaviors.

    b. An increase in positive parenting from time 1 to time 2 will predict a decrease in sexual behaviors.

8. Treatment and therapist attributes

    a. Therapeutic alliance/engagement in treatment

        i. Greater engagement in treatment and a stronger therapeutic alliance at time 1 will predict a decrease in sexual behaviors.

    b. Therapist theoretical orientation

        i. A cognitive-behavioral orientation at time 1 will predict a decrease in sexual behaviors.

        ii. Non-cognitive-behavioral orientations at time 1 will predict no change or an increase in sexual behaviors.

    c. Treatment techniques and content

i. Greater use of the following therapeutic techniques and content at time 1 will predict a decrease in sexual behaviors: sex education, education regarding appropriate and inappropriate sexual behaviors, therapist modeling of behaviors, therapist lectures or presentations, behavioral skills practice, corrective therapist feedback or limit-setting, positive therapist feedback.

ii. Greater use of interventions for sexual deviance and sexual offending will predict no change or an increase in sexual behaviors.

Figure 1. Hypothesized predictors of decreased sexual behaviors at time 2.

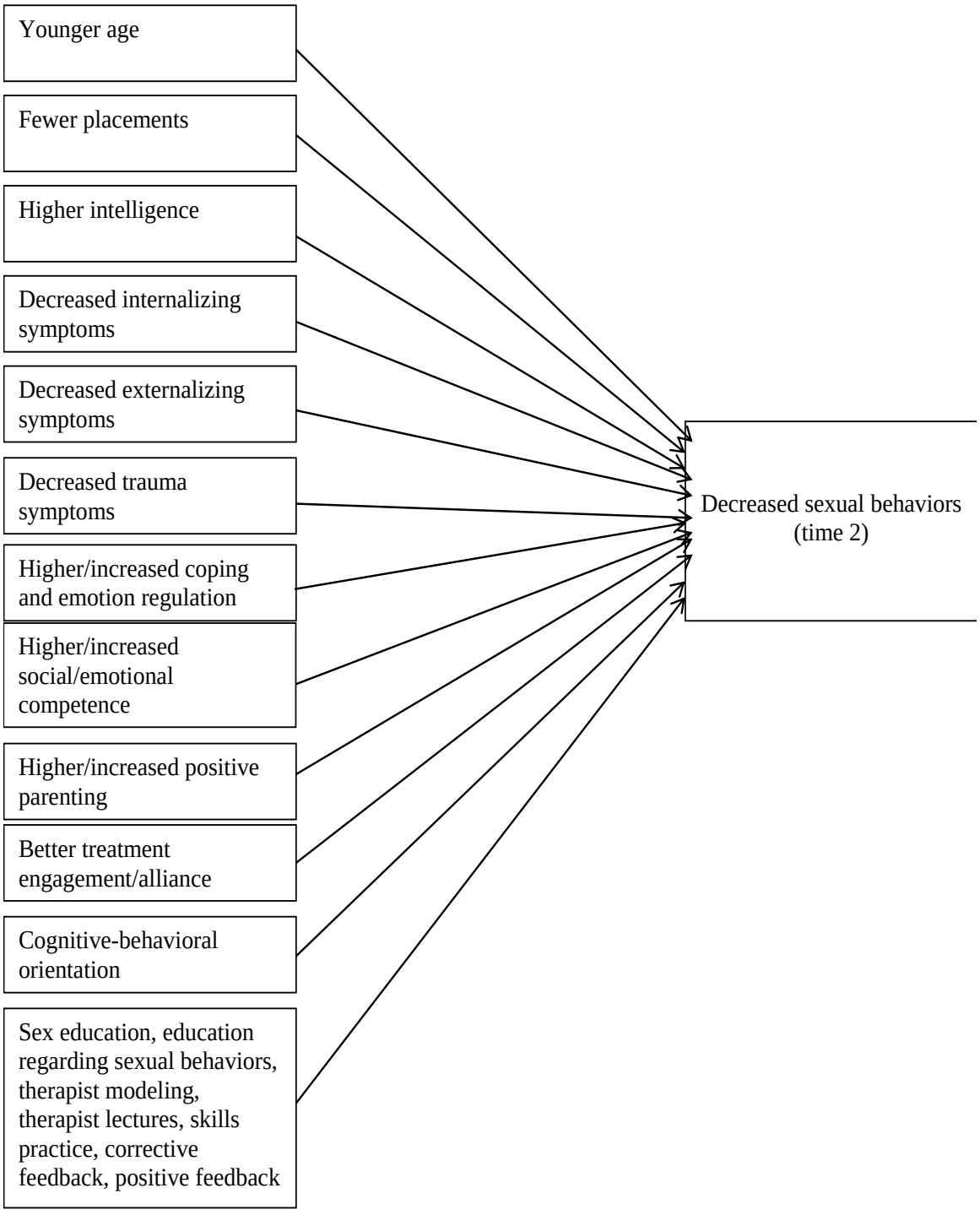
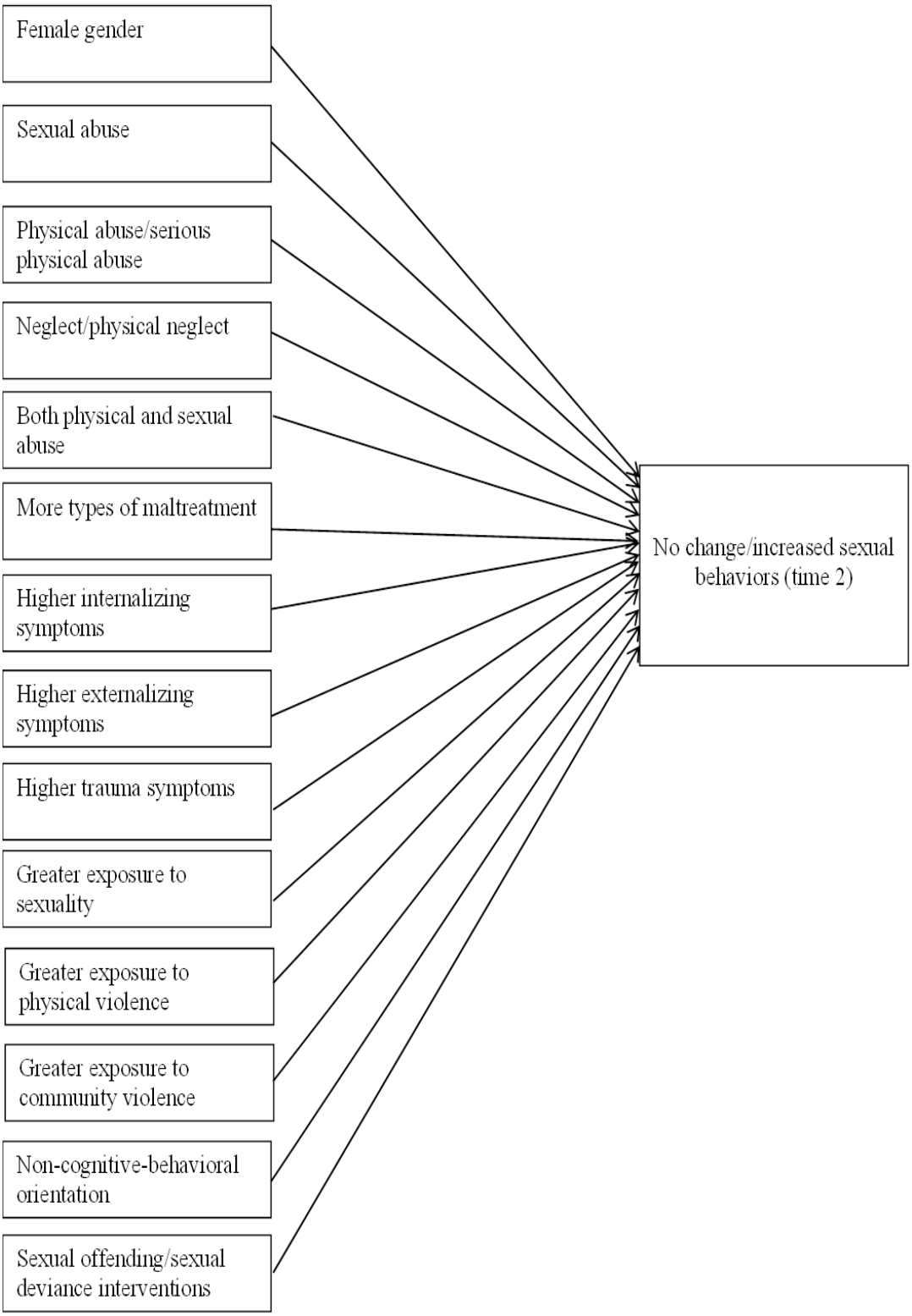


Figure 2. Hypothesized predictors of unchanged or increased sexual behaviors at time 2.



CHAPTER VI

METHOD

Participants

Participants included 145 youth and their primary caregivers and mental healthcare providers. All youth resided in Cook County, Illinois and were under custody of the state Department of Children and Family Services (DCFS), Illinois' child welfare system. Potential youth participants were identified on the basis of reports that these children had engaged in problematic sexual behavior while under the child welfare system's care. As a result of these reported behaviors, youth had been screened into the aforementioned Sexually Aggressive Children and Youth (SACY) program. At disposition, youth were between 4.48 and 12.97 years old (M = 9.58, SD = 2.43). On average, youth completed the first time point of the study 6.27 months after disposition (SD = 5.05, range = .50-21.97). Thus, at time 1, the average age of the youth participants was 10.09 years (SD = 2.57, range = 5.01-13.95). The sample was 65% female. The majority of the youth were African-American (90%), while the others were Latino (6%), Caucasian (3%), or multi-ethnic (1%).

At the time that they were screened into the study, youth were in a variety of placements. Most were living in traditional (43%) or specialized (20%) foster homes, while 10% were living with relatives. An additional 15% were in residential treatment,

and 6% were in group homes. The remaining participants were in the shelter (3%), hospitalized (2%), or incarcerated (1%).

At time 1, caregivers were 86% female and 9% male; sex was not reported by the remaining caregivers. Data on caregivers' relationships to youth participants were available for 68% of the sample at time 1. The majority of caregivers were foster parents (61%). The remaining caregivers included adoptive parents (1%), stepparents (1%), and other types (5%). At the end of the study, caregivers were 83% female and 16% male. Forty-six percent of caregivers were foster parents, 5% were adoptive parents, 1% were stepparents, and 12% had another relationship to the child. Thirty-six percent of caregivers did not report their relationship to the child for whom they completed the survey. At time 1, current therapists completed surveys for 81% of the youth, and former therapists provided data for an additional 11% of the sample. This information was missing for the remaining 8% of youth. At time 2, current therapists completed the survey for 67% of the youth. Former therapists reported on 8% of the youth, while a therapist's supervisor provided data for 1% of the sample.

Procedure

State guardianship was first verified for potential participants, followed by a discussion of the appropriateness of the child's participation with his or her caseworker. Caregivers provided informed consent, and youth assented to participate. Participants received gift cards as compensation. Caregivers completed paper-and-pencil questionnaires, while children ages 10 and older provided self-report data using a laptop; younger children did not participate directly in the study. Data were also obtained from DCFS records. Data were collected at two time points: once approximately one to 22

months (*M* = 6.64, *SD* = 4.89) following a report of sexually inappropriate behavior and again approximately six to 37 months later (*M* = 18.63, *SD* = 6.28).

Measures

Child maltreatment. Electronic data from DCFS were used to assess children's histories of physical abuse, sexual abuse, and neglect. Data indicated whether or not children had experienced indicated physical abuse, serious physical abuse, neglect, physical neglect, or sexual abuse by any individual. In addition to these dichotomous predictors, a variable representing cumulative experiences of maltreatment was created by calculating the total types of maltreatment (up to five) that a child had experienced.

Child welfare placement history. Electronic records from DCFS were used to calculate the total number of substitute care placements children had experienced at the start of the study.

Exposure to sexuality. Children ages 10 and older at time 1 responded to two items developed for the study pertaining to their exposure to sexuality. Children indicated "yes" or "no" in response to the questions, "Have you ever seen a naked person in a picture or movie or magazine?" and "Have you ever seen people doing sexual stuff in a movie or magazine or porno?" Cronbach's alpha for these two items at time 1 was .79. A variable representing children's total exposure to sexuality was computed by summing the number of "yes" responses to these two items.

Social/emotional competence. Caregivers rated youths' social behaviors using the Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984). The 37 items were rated on a 5-point scale (0 = "Never," 1 = "Sometimes," 2 = "Usually," 3 = "Don't know," 4 = "No opportunity"). Responses with ratings of 3 or 4 were excluded

from the analyses. Sample items include “Has a group of friends” and “Labels happiness, sadness, fear, and anger in self.” Cronbach’s alpha for this sample at time 1 was .96.

Children’s sexual behaviors. Caregivers rated the frequency of children’s sexual behaviors “recently or in the last six months” using a modified 44-item version of the Child Sexual Behavior Inventory (CSBI; Friedrich et al., 1992). Behaviors were rated using a 4-point Likert scale (0 = “Never,” 1 = “Less than once a month,” 2 = “1-3 times a month,” 3 = “At least once a week”). Though the CSBI was developed for use by biological parents, it has also been used successfully by foster parents and residential treatment center staff (Baker et al., 2008). Sample items include “Masturbates with hand,” “Talks about sexual acts,” “Shows sex (private) parts to children,” and “Tries to have sexual intercourse with another child or adult.” Cronbach’s alpha for this sample at time 1 was .95.

Internalizing and externalizing symptoms. Caregivers reported on children’s mental health using the Conners’ Parent Rating Scale-Revised (CPRS-48; Goyette, Conners, & Ulrich, 1978) Three scales assessed children’s externalizing symptoms, including conduct problems (α = .87), impulsive-hyperactive behaviors (α = .78), and hyperactivity (α = .89). The two internalizing scales assessed children’s anxiety symptoms (α = .68) and psychosomatic symptoms (α = .71). Caregivers rated children’s behaviors on a 4-point Likert scale (0 = “Not at all,” 1 = “Just a little,” 2 = “Pretty much,” 3 = “Very much”). Sample externalizing items include “Fights constantly,” “Excitable, impulsive,” and “Restless, always up and on the go.” Sample internalizing items include “Having stomach aches” and “Worries more than others.”

Parenting. Children ages 10 and older at time 1 completed the five-item positive parenting subscale of the Parenting Practices Measure (Tolan, Gorman, Smith, & Henry, 2000). Youth were instructed to respond based on their interactions with the person who cared for them most in their current living situation. Items ($\alpha = .80$) were rated on a 5-point Likert scale (1 = "Never," 2 = "Rarely," 3 = "Sometimes," 4 = "Often," 5 = "Almost always." Sample items include "How often has this person said something nice to you about something good you did" and "How often has this person given you a pat on the back or a hug for something good you did."

Exposure to physical conflict. Children ages 10 and older at time 1 reported on acts of physical violence they had witnessed between adults with whom they had lived. They responded to nine items adapted from the revised Conflict Tactics Scales (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) using a 5-point Likert scale (1 = "Never," 2 = "Only once," 3 = "2-5 times total," 4 = "6-10 times total," 5 = "More than 10 times"). Sample items include "One of the adults slapped another adult" and "One of the adults beat up another adult." Cronbach's alpha for this scale at time 1 was .93.

Exposure to community violence. Children ages 10 and older at time 1 reported on their observations of violence in their neighborhoods. Nineteen items were adapted from the Survey of Children's Exposure to Violence (Richters & Saltzman, 1990) and rated on a 5-point Likert scale (1 = "Never," 2 = "Only once," 3 = "2-5 times total," 4 = "6-10 times total," 5 = "More than 10 times"). Sample items include "Seen someone drunk," "Seen someone punch, hit, or slap someone else," and "Seen someone shoot or try to shoot someone else." Internal consistency for this scale at time 1 was .87.

Trauma symptoms. Children ages 10 and older at time 1 reported on their symptoms during the previous six months using the Trauma Symptom Checklist for Children (TSCC; Briere, 1996). Four of the clinical scales were included in this study: anxiety (α = .81), depression (α = .81), posttraumatic stress (α = .88), and sexual concerns (α = .83). Children rated symptom frequency using a 4-point Likert scale (0 = "Never," 1 = "Sometimes," 2 = "Lots of times," 3 = "Almost all the time"). Sample items from each scale include "Feeling nervous or jumpy inside," "Feeling sad or unhappy," "Can't stop thinking about something bad that happened to me," and "Can't stop thinking about sex," respectively.

Child cognitive functioning. Therapists reported on children's cognitive functioning, based either on test results or on their perception of the child. Using a 5-point Likert scale, therapists classified children as having above-average intelligence (IQ above 110), average intelligence (IQ between 90 and 110), borderline cognitive functioning (IQ between 70 and 89), mild retardation (IQ between 60 and 69), or significant retardation (IQ below 60). Lower scores indicate higher cognitive functioning.

Coping skills/emotion regulation. Mental healthcare providers reported on youths' coping skills and emotion regulation using seven items developed for the present study. Sample items include "He/She responds appropriately to stressful situations" and "He/She gets out of control when angry or upset." Therapists rated each item on a 4-point Likert scale (1 = "Very much," 2 = "Somewhat," 3 = "A little," 4 = "Not at all"). Two items were reverse-scored so that higher scores reflect more adaptive coping skills and emotion regulation. Cronbach's alpha for this scale at time 1 was .84.

Therapeutic alliance and engagement in treatment. Therapists reported on their therapeutic relationships with youth using eight items developed for the study. Sample items include "The therapeutic alliance is in its beginning stages" and "Characterize his/her present level of self-disclosure." Items were rated on 4- and 5-point scales, with responses of "Don't know" excluded from analyses. Two items were recoded such that higher scores reflect stronger alliance and greater engagement in treatment. Internal consistency at time 1 was .77.

Treatment techniques and content. Therapists reported on a number of aspects of youths' therapy. Using 4-point Likert scales (1 = "Very often," 2 = "Sometimes," 3 = "Rarely," 4 = "Never"), they indicated the frequency with which they had used several techniques in individual therapy. The frequency of use of other techniques was rated on a 5-point Likert scale (1 = "Never," 2 = "Rarely," 3 = "Occasionally," 4 = "Frequently," 5 = "Repeatedly until mastered." The frequency with which various topics had been discussed during the past three months in all types of therapy was rated on a 6-point scale (1 = "Never," 2 = "Rarely," 3 = "Occasionally," 4 = "Regularly," 5 = "Always," 6 = "Don't Know"). A principal components analysis with varimax rotation was conducted using mean substitution for missing data. This analysis yielded five factors with eigenvalues of at least 1.0. For conceptual reasons, the five items comprising the fourth and fifth factors were retained as separate items, resulting in a three-factor solution. An item was assigned to a given factor if the correlation between the item and factor was at least .40. Three items loaded onto two factors each. In one of these instances, the difference in the magnitude of the two item-factor correlations was .30, so the item was assigned to the factor with which it correlated more strongly. For the remaining two

items, the differences in the item-factor correlations were .16 and .03. In these cases, factor assignments were determined conceptually; in both cases, items were assigned to the factors with which they were more highly correlated.

The final three factors were as follows: sex education (five items; e.g., information regarding reproduction and sexually transmitted diseases), education regarding appropriate and inappropriate sexual behaviors (three items; e.g., definitions of sexual abuse, assault, and/or harassment; definitions of sexual deviance; and information regarding normative sexual behavior), and interventions specific to sexual offending and sexual deviance (seven items; e.g., working towards responsibility for sexual offenses, conditioning techniques to reduce deviant arousal, and discussing assault cycle concepts). Cronbach's alphas for the three scales at time 1 were .88, .79, and .85, respectively. The remaining five items that were not assigned to factors pertained to techniques used in individual therapy ("therapist modeling of specific behaviors," "therapist lectures or presentations," "asking [the child] to practice specific behavioral skills," "corrective therapist feedback or limit-setting," and "positive therapist feedback that increases appropriate forms of self-expression or communication").

Therapist theoretical orientation. Mental healthcare providers were asked to indicate the theoretical orientation(s) that characterized their approach to treating youth with sexual behavior problems. Theoretical orientations included medical/biological, psychodynamic, behavioral, cognitive-behavioral, family systems, and other.

Data Analysis

For a subset of predictor variables (the Vineland Adaptive Behavior Scales, the positive parenting subscale of the Parenting Practices Measure, the six internalizing and

externalizing scales of the Conners' Parent Rating Scale-Revised, the four scales of the Trauma Symptom Checklist for Children, and the measure of coping skills and emotion regulation), change scores will be created by subtracting scores at time 1 from those at time 2. CSBI change scores were created by subtracting youths' scores at time 1 from their scores at time 2. The resulting values were used to classify children's sexual behaviors as improved, worsened, or unchanged using the reliable change index (RCI; Jacobson & Truax, 1991). The RCI is a measure of clinical significance that is calculated based on a measure's test-retest reliability and standard deviation of scores. Typically, demonstration of clinically significant change requires that the magnitude of change in a person's score be substantial enough that it cannot be attributed to measurement error or change (i.e., statistically reliable) and that the score be within a normative range (Jacobson, Roberts, Berns, & McGlinchey, 1999). However, this approach to change does not permit the study of declines in functioning since there is no way to establish a cutoff point for clinical significance (Jacobson et al., 1999). Furthermore, given the clinical severity of the present sample, it may not be practical to study change only among children whose behaviors improved so much as to enter into the normative range. Specifically, the time 1 CSBI mean item score in the present sample was .38 (*SD* = .46). By comparison, the mean item scores in Friedrich et al.'s (2001) normative, psychiatric, and sexual abuse samples and in Thigpen's (2009; Thigpen & Fortenberry, 2009) normative African-American sample were .10 (*SD* = .12), .13 (.19), .36 (.40), and .08 (standard deviation not reported), respectively. Thus, this study will focus on statistically reliable, but not necessarily clinically significant, changes in children's sexual behaviors. Using Jacobson and colleagues' (1999) terminology, those children whose behaviors

decreased by a reliably significant degree would be classified as "improved but not recovered;" any children who demonstrated both statistically reliable and clinically significant improvement change would be identified as "recovered" (p. 300).

The RCI formula (Jacobson & Truax, 1991) is as follows:

$$RC = (x_2 - x_1)/S_{diff}$$

where RC equals reliable change; x_1 and x_2 represent an individual's CSBI scores at time 1 and time 2, respectively; and S_{diff} (the standard error of the CSBI change scores) refers to the expected distribution of change scores in the absence of any true change. The formula for the standard error of difference scores is as follows:

$$S_{diff} = \sqrt{(2S_E^2)}$$

S_E refers to the standard error of measurement and is as follows:

$$s\sqrt{(1-r_{xx})}$$

where s represents the standard deviation of the time 1 CSBI scores and r_{xx} refers to the test-retest reliability of the CSBI. RC scores greater than 1.96 are considered to indicate statistically reliable change (Jacobson & Truax, 1991). In the present sample, s = .46 and r_{xx} = .91 (See Friedrich et al., 2001 for test-retest reliability). Therefore, a CSBI difference score less than -.38 indicates reliable improvement (improved), while a difference score greater than .38 points to reliable worsening or exacerbation (i.e., an increase in the child's CSBI score). Based on this result, 23 children (16%) are designated as improved, and 11 (8%) are classified as worsened. The remaining 111 children (77%) exhibited no reliable change in their CSBI scores.

In addition to classifying children based on their CSBI change scores, Optimal Data Analysis (ODA; Soltysik & Yarnold, 1993; Yarnold & Soltysik, 2005) will be used

to identify predictors of children's classification status. ODA is an exploratory approach that maximizes a model's classification accuracy. Though the outcome variable (change in CSBI scores) has three categories (improved, worsened, no change), due to the small size of the subset of children whose CSBI scores increased over time, the outcome will be treated as a binary class variable, and two separate ODA analyses will be run. The first analysis will use the full sample to predict children's classification as "improved" versus "worsened or no change." The second analysis will include only the 34 children who exhibited reliable change in their behaviors and predict classification as "improved" versus "worsened."

The statistical approach used in ODA permits testing of an unlimited number of variables as possible predictors without an increase in the Type I error rate. Additionally, ODA identifies interactions among variables for specific subgroups of individuals, rather than for a sample as a whole, thereby allowing for increased accuracy of prediction (Yarnold & Soltysik, 2005). Thus, given the limited number of studies of longitudinal changes in children's sexual behaviors, ODA offers an ideal approach that can examine the predictive value of a large number of variables, along with potential moderators, which have not yet been identified in the literature. ODA is not limited by many of the assumptions and data requirements (e.g., linearity, the number of class levels, attribute metrics, or class sample-size imbalances) that are known to have a significant impact on the results of traditional prediction methods (e.g., logistic regression). ODA accomplishes this in part by simultaneously analyzing as many attributes as one wants without the limitations of the ratio of attributes to sample size or problems of multicollinearity (Yarnold & Soltysik, 2005). This is because ODA tests the overall effect of each attribute on a class variable

individually and selects only the single most influential attribute at each node. This strategy differs from regression analysis, which calculates the partial effect of each variable independent of the effects of other variables when considered simultaneously.

For each ODA analysis, univariate analyses (UniODA; Yarnold & Soltysik, 2005) will first be used to test for main effects in the model. Time 1 variables and change scores will be entered to identify significant predictors of classification in each of the outcome categories. Based on the results, it will be determined whether the classification performance of each variable is stable using a leave-one-out (LOO) procedure. Using this method, each case is removed from the sample one at a time and classified based on the model obtained when that case is excluded (Suzuki, Bryant, & Edwards, 2010; Yarnold & Soltysik, 2005, as cited in Soltysik & Yarnold, 2010). This approach helps to ensure the validity and generalizability of the classification tree analysis, since only variables that are LOO stable (or nearly so) can enter into the multivariate model (Soltysik & Yarnold, 2010; Suzuki, et al., 2010; Yarnold & Soltysik, 2005, as cited in Soltysik & Yarnold, 2010). Significant predictors will then be submitted to a multivariate classification tree analysis (CTA) using the Automated CTA software package (Soltysik & Yarnold, 2010), which will identify interactions between variables, forming subgroups of youth belonging to each of the classification categories. To accomplish this, the predictor with the highest effect strength will be selected, and optimal cut-points on this variable will be established in order to divide the sample into two subgroups. This process will be repeated for each of the two groups in turn, forming "branches" (subgroups) until no further divisions are possible (Yarnold & Soltysik, 2005). Dunn and Sidak adjusted per-comparison *p* values will be used to test the significance of the overall

model at experiment-wise alphas of .05, .10, and .15. The *p* value is adjusted for the number of contrasts conducted in the classification tree, thus controlling the overall probability of a Type I error ("pruning"). At each alpha level, the pruned and unpruned models will be compared with an enumerated model using the enumerated command with no options. This command specifies that all combinations of attributes in the top three nodes will be evaluated. These procedures will result in nine multivariate classification tree models each for the full sample and the subsample of children whose sexual behaviors changed significantly (i.e., change sample). For each of these samples, the model with the optimal combination of high effect strength for sensitivity, high minimum denominator, and low alpha will be selected.

Once the final models for the full and change samples are determined, post-hoc analyses will be conducted to probe for differences between children in each of the subgroups formed by the multivariate models. For each sample, chi-square tests will be used to test for between-group differences in gender, history of maltreatment (physical abuse, serious physical abuse, sexual abuse, neglect, and physical neglect), and treatment provider theoretical orientation (cognitive-behavioral versus other). One-way analyses of variance (ANOVAs) will be used to examine possible differences in time 1 sexual behaviors and child functioning (i.e., internalizing, externalizing, and trauma-related symptoms; coping skills and emotion regulation; and social and emotional competence).

CHAPTER VII

RESULTS

Descriptive Statistics

Descriptive statistics were calculated for all variables entered as predictors of children's classification status with regard to changes in their sexual behaviors (See Table 2). The sample was 65% female with an average age of approximately 10 years old. Neglect was the most commonly experienced form of maltreatment (70%), with children experiencing as many as five types of maltreatment (e.g., sexual abuse, physical abuse, neglect; $M = 1.33$, $SD = .97$). Therapist reports of children's cognitive functioning indicated that overall, the sample was of below-average intelligence ($M = 2.65$, $SD = .72$, between "normal" and "borderline"). Caregivers and children reported the presence of a number of internalizing, externalizing, and trauma-related symptoms, with caregiver-rated conduct, impulsive-hyperactive, and hyperactive symptoms being the most severe. Conduct symptoms, hyperactive symptoms, and child-reported symptoms of post-traumatic stress and anxiety improved the most on average, with more negative change scores indicating larger improvements in symptoms across time points. On average, no symptoms increased across the entire sample. Moderate levels of coping and emotion regulation abilities and social and emotional competence were reported for the sample (Higher scores reflect more adaptive functioning.). The majority of children (79%) had

treatment providers who endorsed a cognitive-behavioral approach to treating youth with inappropriate sexual behaviors.

Table 2. Descriptive Statistics for Variables Entered as Predictors in Optimal Data Analysis

Variable	N	%	Mean (SD)	Min./Max.
Child Characteristics				
Age (T1)	145		10.09 (2.57)	5.01/13.95
Gender (female)	94	65		
Maltreatment History				
Physical Abuse (indicated)	44	30		
Serious Physical Abuse (indicated)	10	7		
Sexual Abuse (indicated)	12	8		
Neglect (indicated)	102	70		
Physical Neglect (indicated)	25	17		
Total Types of Maltreatment	145		1.33 (.97)	0/5
Child Welfare History				
Number of placements (T1)	137		6.39 (3.54)	1/20
Child Functioning				
Cognitive Functioning (T1)	135		2.65 (.72)	1/4
Anxiety Symptoms (T1)	145		.84 (.71)	.00/3.00
Anxiety Symptoms (Change)	145		-.11 (.84)	-3.00/1.75
Psychosomatic Symptoms (T1)	145		.32 (.49)	.00/2.50
Psychosomatic Symptoms (Change)	145		-.02 (.55)	-2.25/1.75
Conduct Symptoms (T1)	145		1.51 (.78)	.00/2.88
Conduct Symptoms (Change)	145		-.23 (.85)	-2.50/1.75
Impulsive-Hyperactive Symptoms (T1)	145		1.75 (.88)	.00/3.00
Impulsive-Hyperactive Symptoms (Change)	145		-.16 (1.01)	-2.50/2.00
Hyperactive Symptoms	145		1.54 (.79)	.00/3.00

(T1)			
Hyperactive Symptoms (Change)	145	-.23 (.85)	-2.50/1.40
Anxiety Symptoms—Child Self-Report (T1)	71	.74 (.63)	.00/2.57
Anxiety Symptoms—Child Self-Report (Change)	62	-.21 (.59)	-1.43/1.43
Depression Symptoms—Child Self-Report (T1)	71	.70 (.56)	.00/3.00
Depression Symptoms—Child Self-Report (Change)	62	-.14 (.53)	-1.22/1.11
Post-Traumatic Stress Symptoms—Child Self-Report (T1)	71	.84 (.67)	.00/3.00
Post-Traumatic Stress Symptoms—Child Self-Report (Change)	62	-.23 (.57)	-1.40/1.50
Sexual Concerns—Child Self-Report (T1)	71	.45 (.48)	.00/2.70
Sexual Concerns—Child Self-Report (Change)	62	.03 (.57)	-1.50/2.00
Coping Skills/Emotion Regulation (T1)	134	2.19 (.65)	1.00/4.00
Coping Skills/Emotion Regulation (Change)	111	.27 (.78)	-1.43/2.14
Social/Emotional Competence (T1)	145	1.20 (.33)	.32/1.94
Social/Emotional Competence (Change)	145	.38 (.46)	-.64/1.59
Exposure to Sexuality (T1)	71	.94 (.91)	0/2
Exposure to Violence			
Exposure to Physical Conflict (T1)	71	1.48 (.82)	1.00/5.00
Exposure to Community Violence (T1)	71	1.76 (.64)	1.00/3.89
Positive Parenting (T1)	71	3.79 (.95)	1.20/5.00
Positive Parenting (Change)	62	-.04 (1.13)	-4.00/2.00
Treatment and Therapist Attributes			
Therapeutic Alliance/Engagement in Treatment (T1)	133	2.85 (.61)	1.63/4.00
Therapist Theoretical	114		

Orientation (T1; Cognitive-behavioral)			
Sex Education (T1)	109	1.84 (.83)	1.00/4.40
Education About Sexual Behaviors (T1)	119	2.77 (.98)	1.00/5.00
Sexual Deviance/Sexual Offender Interventions (T1)	135	2.81 (.84)	1.00/4.86
Therapist Modeling of Behaviors (T1)	133	1.63 (.78)	1/4
Therapist Lectures/Presentations (T1)	133	2.95 (.96)	1/4
Behavioral Skills Practice (T1)	133	1.57 (.74)	1/4
Corrective Therapist Feedback/Limit-Setting (T1)	133	1.32 (.65)	1/4
Positive Therapist Feedback (T1)	133	1.16 (.42)	1/4

Note: Change scores were computed by subtracting scores at time 1 from scores at time 2. For treatment variables, higher scores for sex education, education about sexual behaviors, and sexual deviance/sexual offender interventions indicate more frequent discussion of these topics and use of these techniques. For variables pertaining to individual treatment techniques (i.e., therapist modeling, therapist lectures/presentations, behavioral skills practice, corrective therapist feedback/limit-setting, and positive therapist feedback), lower scores indicate more frequent use.

ODA Results

As previously described, significant predictors of children's classification status in the full sample (i.e., "improved" versus "worsened or no change") and in the change sample (i.e., "improved" versus "worsened") were determined via univariate ODA (UniODA). For each variable, optimal cutpoints for classification were determined, and classification performance statistics (overall accuracy, sensitivity, specificity, and effect strength for sensitivity) were computed. Overall accuracy refers to the percentage of cases that were correctly classified by the multivariate model; for models with binary class variables, a 50% accuracy rate is expected by chance (Yarnold & Soltysik, 2005).

Sensitivity refers to the percentage of cases in a particular class category that are correctly classified as belonging to that category (Yarnold & Soltysik, 2005). Specificity refers to the percentage of cases classified within an outcome category that in fact belong within that category. Effect strength for sensitivity (ESS) assesses the performance of a model in terms of the percentage by which it improves upon the classification accuracy expected by chance. A value of 0% for ESS indicates that the model performed no better than chance, whereas a value of 100% indicates that the model made no classification errors. ESS is calculated using the formula ESS = (classification accuracy – C*) / (100 – C*) x 100%, where C* = 100 / C, and C is equal to the number of class categories (in the present case, two; Yarnold & Soltysik, 2005).

Multivariate analyses were then conducted to determine the final ODA classification tree models for the full and change samples. These models are shown in Figures 3 and 4. Arrows within the figures indicate pathways predicting classification status. Each variable that significantly predicted classification status is contained within a rectangle (node) indicating a decision point. The significance of each predictor is indicated by the *p* value within the node. The numbers adjacent to the arrows represent the optimal cutoff values used to classify individuals within the model. The lettered nodes in the figures represent the final subgroups formed by each model. Within these nodes, the fractions and percentages indicate the number of individuals in each subgroup and the percentage of these who were correctly classified.

Full Sample

Table 3 displays the results of the univariate analyses for the full sample. Among those variables that were LOO stable within the sample, time 1 treatment and therapist

attributes, time 1 child functioning variables, and changes in children's symptoms emerged as significant predictors of classification status. Specifically, mental healthcare provider reports of more frequent use of lectures and presentations, more frequent modeling of specific behaviors, and a cognitive-behavioral approach to treating youth with sexual behavior problems predicted improvement in children's sexual behaviors (all p's < .05). At time 1, children whose caregivers reported more severe conduct, hyperactive, impulsive-hyperactive, and psychosomatic symptoms were predicted to show improvements in their sexual behaviors (all p's < .01). Children whose caregivers reported greater decreases (i.e., improvement) in their impulsive-hyperactive and psychosomatic symptoms were predicted to show improvements in their sexual behaviors (p's < .01). Larger decreases in child-reported sexual concerns also predicted improvements in sexual behaviors (p < .001).

Table 3. UniODA Results: Full Sample

Variable	Improvement	Worsening/ No Change	Overall Classification Accuracy	Effect Strength for Sensitivity	Sensitivity (Improvement)	Sensitivity (Worsening/ No Change)	Specificity (Improvement)	Specificity (Worsening/ No Change)	*p*-value	LOO Stable
Gender	Male	Female	65.52%	20.21%	52.17%	68.03%	23.53%	88.30%	.054	Yes
Sexual abuse (time 1)	Yes	No	81.38%	10.83%	17.39%	93.44%	33.33%	85.71%	.100	Yes
Neglect (time 1)	No	Yes	65.52%	6.09%	34.78%	71.31%	18.60%	85.29%	.360	Yes
Physical neglect (time 1)	No	Yes	30.34%	10.16%	91.30%	18.85%	17.50%	92.00%	.192	Yes
Physical abuse (time 1)	No	Yes	40.69%	15.40%	82.61%	32.79%	18.81%	90.91%	.107	Yes
Serious physical abuse (time 1)	No	Yes	21.38%	3.03%	95.65%	7.38%	16.30%	90.00%	.508	Yes
Cognitive functioning (time 1)	>1	1	4.44%	-83.71%	13.64%	2.65%	2.65%	13.64%	1.00	No
Therapist lectures or presentations (time 1)	1	>1	81.95%	16.42%	22.73%	93.69%	41.67%	85.95%	.028	Yes
Therapist modeling of specific behaviors (time 1)	1	>1	55.64%	24.98%	72.73%	52.25%	23.19%	90.63%	.027	Yes
Behavioral skills practice (time 1)	1	>1	49.62%	14.13%	68.18%	45.95%	20.00%	87.93%	.162	Yes
Corrective therapist feedback or limit-setting (time 1)	1	>1	36.09%	12.49%	86.36%	26.13%	18.81%	90.63%	.164	Yes
Positive therapist feedback (time 1)	>1	1	73.68%	-4.42%	9.09%	86.49%	11.76%	82.76%	.817	No
Age (time 1)	≤10.08	>10.08	54.48%	3.56%	47.83%	55.74%	16.92%	85.00%	.463	No
Total types of	0	>0	67.59%	5.02%	30.43%	74.59%	18.42%	85.05%	.393	No

maltreatment (time 1)										
Social/ emotional competence (time 1)	≤1.33	>1.33	42.07%	6.45%	69.57%	36.89%	17.20%	86.54%	.367	No
Social/ emotional competence (change)	>.47	≤.47	54.48%	-3.49%	39.13%	57.38%	14.75%	83.33%	.703	No
Positive parenting (time 1)	≤4.30	>4.30	16.90%	-42.65%	44.44%	12.90%	6.90%	61.54%	.999	No
Positive parenting (change)	≤1.10	>1.10	4.84%	-62.50%	37.50%	0.00%	5.26%	0.00%	1.00	No
Conduct (time 1)	>1.44	≤1.44	59.31%	44.58%	91.30%	53.28%	26.92%	97.01%	<.001	Yes
Conduct (change)	≤-.44	>-.44	65.52%	20.21%	52.17%	68.03%	23.53%	88.30%	.054	No
Impulsivity-hyperactivity (time 1)	>2.38	≤2.38	72.41%	35.46%	60.87%	74.59%	31.11%	91.00%	.001	Yes
Impulsivity-hyperactivity (change)	≤-.88	>-.88	77.24%	34.14%	52.17%	81.97%	35.29%	90.09%	.001	Yes
Hyperactivity (time 1)	>1.53	≤1.53	60.69%	46.22%	91.30%	54.92%	27.63%	97.10%	<.001	Yes
Hyperactivity (change)	≤-.95	>-.95	78.62%	35.78%	52.17%	83.61%	37.50%	90.27%	<.001	No
Anxiety—caregiver report (time 1)	>1.13	≤1.13	67.59%	8.55%	34.78%	73.77%	20.00%	85.71%	.273	No
Anxiety—caregiver report (change)	≤-.13	>-.13	57.24%	20.96%	65.22%	55.74%	21.74%	89.47%	.053	Yes
Psychosomatic symptoms (mean)	>.38	≤.38	72.41%	31.93%	56.52%	75.41%	30.23%	90.20%	.003	Yes
Psychosomatic symptoms	≤-.38	>-.38	80.00%	33.89%	47.83%	86.07%	39.29%	89.74%	<.001	Yes

(change)										
Anxiety—child self-report (time 1)	≤1.07	>1.07	39.44%	11.65%	77.78%	33.87%	14.58%	91.30%	.389	No
Anxiety—child self-report (change)	>-.50	≤-.50	38.71%	18.98%	87.50%	31.48%	15.91%	94.44%	.256	No
Depression (time 1)	>.61	≤.61	59.15%	34.23%	77.78%	56.45%	20.59%	94.59%	.058	Yes
Depression (change)	≤.00	>.00	46.77%	6.94%	62.50%	44.44%	14.29%	88.89%	.510	No
Post-traumatic stress (time 1)	>.65	≤.65	52.11%	16.67%	66.67%	50.00%	16.22%	91.18%	.283	No
Post-traumatic stress (change)	≤-.55	>-.55	45.16%	-16.20%	37.50%	46.30%	9.38%	83.33%	.892	No
Sexual concerns (time 1)	>.45	≤.45	59.15%	5.73%	44.44%	61.29%	14.29%	88.37%	.506	No
Sexual concerns (change)	≤-.45	>-.45	85.48%	62.04%	75.00%	87.04%	46.15%	95.92%	<.001	Yes
Exposure to physical conflict (time 1)	>2.06	≤2.06	76.06%	-12.90%	0.00%	87.10%	0.00%	85.71%	1.00	No
Exposure to community violence (time 1)	≤1.16	>1.16	84.51%	15.77%	22.22%	93.55%	33.33%	89.23%	.164	No
Therapeutic alliance/ engagement in treatment (time 1)	>1.94	≤1.94	22.56%	-11.02%	77.27%	11.71%	14.78%	72.22%	.950	No
Coping/ emotion regulation (time 1)	≤2.50	>2.50	43.28%	13.88%	77.27%	36.61%	19.32%	89.13%	.157	Yes
Coping/ emotion regulation (change)	>-.43	≤-.43	25.23%	-25.09%	55.56%	19.35%	11.76%	69.23%	.993	No
Exposure to sexuality (time 1)	0, 1	2	42.25%	-4.12%	55.56%	40.32%	11.90%	86.21%	.728	No
Number of	≤5	>5	52.55%	4.81%	52.17%	52.63%	18.18%	84.51%	.423	No

placements (time 1)										
Sexual deviance/ sexual offender interventions (time 1)	>3.79	≤3.79	76.30%	-8.85%	0.00%	91.15%	0.00%	82.40%	1.00	No
Sex education (time 1)	≤1.90	>1.90	43.12%	13.43%	76.47%	36.96%	18.31%	89.47%	.217	No
Education about sexual behaviors (time 1)	≤2.83	>2.83	53.78%	18.15%	66.67%	51.49%	19.67%	89.66%	.122	Yes
Therapist theoretical orientation (time 1)	Cognitive-behavioral	Other	31.85%	18.58%	100.00%	18.58%	19.30%	100.00%	.017	Yes

As previously described, in order to determine the optimal classification strategy for the full sample of children, multivariate Optimal Data Analysis was conducted at three different experiment-wise *p* values: .05, .10, and .15. Each analysis yielded three sets of results in the form of unpruned, pruned, and enumerated classification trees. Table 4 shows the overall effect strengths for sensitivity and the minimum number of observations (i.e., the denominator) in the subgroups formed by each tree. The resulting models were compared in order to select the one that had the lowest alpha level while also maximizing effect strength for sensitivity and the size of the minimum denominator. Based on these criteria, the enumerated tree pruned at $p = .10$ was selected as the final multivariate model for the full sample.

Table 4. Effect Strength for Sensitivity (ESS) and Minimum Denominators for Multivariate Optimal Data Analysis Classification Trees: Full Sample

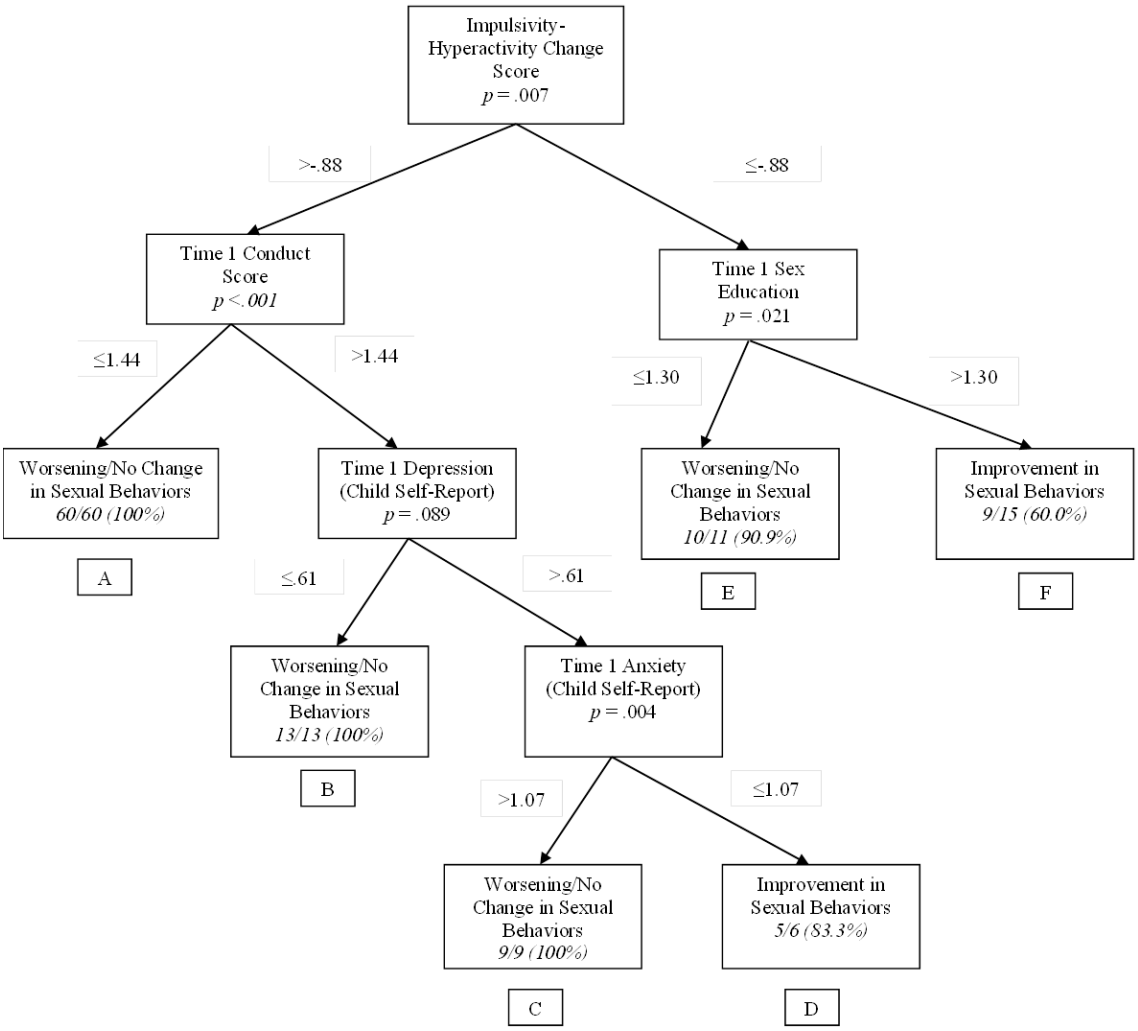
p Value	Unpruned	Pruned	Enumerated
ESS			
.05	83.8%	79.6%	79.6%
.10	83.8%	79.6%	**86.3%**
.15	83.8%	79.6%	97.8%
Minimum Denominator			
.05	3	6	6
.10	3	6	**6**
.15	3	6	2

Note: ESS and minimum denominator values for the selected model are in boldface.

In this model, change in impulsive-hyperactive symptoms emerged as the best predictor and is thus at the uppermost node of the tree (See Figure 3). Children with impulsivity-hyperactivity change scores greater than -.88 (i.e., less improvement or an increase in impulsivity-hyperactivity) were predicted to exhibit worsening or no change in their sexual behaviors (See the left side of the tree.), while children with impulsivity-hyperactivity change scores less than or equal to -.88 (i.e., greater decreases in

impulsivity-hyperactivity) were predicted to show improvements in their sexual behaviors. For the group predicted to show worsening or no change in their sexual behaviors, time 1 conduct symptoms were the next best predictor of classification status. No further analysis was required for the group with lower conduct scores (i.e., less than or equal to 1.44). These children were predicted to show worsening or no change in their sexual behaviors. Classification accuracy for this subgroup was 100% (See node A).

Figure 3. Optimal Data Analysis results for predictors of improvement versus worsening or no change in sexual behaviors in the full sample of children with sexual behavior problems.



Note: Change scores were computed by subtracting scores at time 1 from scores at time 2. Overall classification accuracy was 93.0%. Effect strength for sensitivity was 86.3%.

For children with time 1 conduct scores greater than 1.44, time 1 child self-reports of depressive symptoms were the next best predictor of classification status. Children with time 1 scores greater than .61 were predicted to show improvements in their sexual behaviors. Children with depressive symptom scores less than or equal to .61were

predicted to demonstrate worsening or no change in their sexual behaviors. Further classification of this subgroup was not necessary, as classification status was predicted with 100% accuracy (See node B).

The next best predictor of classification status for children with time 1 depressive symptoms greater than .61 was time 1 self-report symptoms of anxiety. Children with time 1 scores greater than 1.07 on this measure were predicted to show worsening or no change in their sexual behaviors (100% accuracy; see node C). Children with time 1 self-report anxiety scores less than or equal to 1.07 were predicted to exhibit improvements in their sexual behaviors. No other variables emerged as significant predictors of classification status for this subgroup. The accuracy of prediction was 83.3% (See node D).

For children with impulsivity-hyperactivity change scores less than or equal to -.88, the next best predictor of classification status was the frequency with which sex education topics were discussed in therapy (See the right side of the tree.). Children with scores less than or equal to 1.30 were predicted to exhibit worsening or no change in their sexual behaviors (90.9% accuracy; see node E), with no other variables emerging as significant predictors of classification status for this subgroup. The subgroup of children with sex education scores greater than 1.30 were predicted to demonstrate improvements in their sexual behaviors. No other variables significantly predicted classification status for these children. Accuracy of prediction for this subgroup was 60.0% (See node F).

Classification performance statistics for the overall CTA model indicated that the model predicted children's classification status with 93.0% accuracy. Effect strength for

sensitivity of the model was 86.3%. This is considered a strong effect (Yarnold & Soltysik, 2005). Sensitivity for predicted improvement in sexual behaviors was 93.3%, while specificity was 66.7%. For the outcome of worsening or no change in sexual behaviors, sensitivity was 92.9%, and specificity was 98.9%.

Change Sample

Table 5 displays the univariate results for the sample of children who showed significant changes in their sexual behaviors. Of the variables that were LOO stable, time 1 therapist and treatment attributes, as well as children's symptoms at time 1, were significant predictors of classification status. As in the full sample, a cognitive-behavioral orientation towards treatment of youth with sexual behavior problems and more frequent use of therapist lectures and presentations predicted improvement in children's sexual behaviors (p's < .05). Therapist reports of more frequent discussion of sex education topics also predicted improvement in children's sexual behaviors (p < .05). Children whose caregivers reported more severe anxious and psychosomatic symptoms at time 1 were likewise predicted to show improvement in their sexual behaviors (p's < .05).

Table 5. UniODA Results: Change Sample

Variable	Improvement	Worsening/ No Change	Overall Classification Accuracy	Effect Strength for Sensitivity	Sensitivity (Improvement)	Sensitivity (Worsening/ No Change)	Specificity (Improvement)	Specificity (Worsening/ No Change)	*p*-value	LOO Stable
Gender	Female	Male	52.94%	11.46%	47.83%	63.64%	73.33%	36.84%	.400	Yes
Sexual abuse (time 1)	Yes	No	44.12%	17.39%	17.39%	100.00%	100.00%	36.67%	.191	Yes
Neglect (time 1)	Yes	No	58.82%	10.67%	65.22%	45.45%	71.43%	38.46%	.409	Yes
Physical neglect (time 1)	No	Yes	61.76%	-8.70%	91.30%	0.00%	65.62%	0.00%	1.00	No
Physical abuse (time 1)	No	Yes	70.59%	28.06%	82.61%	45.45%	76.00%	55.56%	.095	Yes
Serious physical abuse (time 1)	No	Yes	64.71%	-4.35%	95.65%	0.00%	66.67%	0.00%	1.00	No
Cognitive functioning (time 1)	4	2, 3	33.33%	0.00%	0.00%	100.00%	--	33.33%	1.00	No
Therapist lectures or presentations (time 1)	≤2	>2	57.58%	36.36%	36.36%	100.00%	100.00%	44.00%	.023	Yes
Therapist modeling of specific behaviors (time 1)	1	>1	63.64%	18.18%	72.73%	45.45%	72.73%	45.45%	.255	Yes
Behavioral skills practice (time 1)	3	1, 2	78.79%	68.18%	68.18%	100.00%	100.00%	61.11%	<.001	No
Corrective therapist feedback or limit-setting (time 1)	>1	1	84.85%	72.73%	81.82%	90.91%	94.74%	71.43%	<.001	No
Positive therapist feedback (time 1)	2	1	30.30%	-9.09%	0.00%	90.91%	0.00%	31.25%	1.00	No
Age (time 1)	>7.81	≤7.81	73.53%	41.90%	78.26%	63.64%	81.82%	58.33%	.023	No
Total types of	≤2	3	73.53%	32.41%	86.96%	45.45%	76.92%	62.50%	.052	No

maltreatment (time 1)										
Social/ emotional competence (time 1)	≤1.10	>1.10	61.76%	33.99%	52.17%	81.82%	85.71%	45.00%	.063	Yes
Social/ emotional competence (change)	>.41	≤.41	64.71%	38.34%	56.52%	81.82%	86.67%	47.37%	.039	No
Positive parenting (time 1)	≤3.30	>3.30	27.27%	-66.67%	33.33%	0.00%	60.00%	0.00%	1.00	No
Positive parenting (change)	>-2.20	≤-2.20	60.00%	-25.00%	75.00%	0.00%	75.00%	0.00%	1.00	No
Conduct (time 1)	>1.06	≤1.06	73.53%	27.67%	91.30%	36.36%	75.00%	66.67%	.070	No
Conduct (change)	≤-.69	>-.69	52.94%	6.72%	52.17%	54.55%	70.59%	35.29%	.500	No
Impulsivity-hyperactivity (time 1)	>1.88	≤1.88	58.82%	20.16%	56.52%	63.64%	76.47%	41.18%	.232	No
Impulsivity-hyperactivity (change)	≤.13	>.13	61.76%	10.28%	73.91%	36.36%	70.83%	40.00%	.409	No
Hyperactivity (time 1)	>1.65	≤1.65	73.53%	37.15%	82.61%	54.55%	79.17%	60.00%	.036	No
Hyperactivity (change)	≤-.90	>-.90	50.00%	-2.37%	52.17%	45.45%	66.67%	31.25%	.689	No
Anxiety—caregiver report (time 1)	>.88	≤.88	64.71%	43.08%	52.17%	90.91%	92.31%	47.62%	.017	Yes
Anxiety—caregiver report (change)	≤-.13	>-.13	70.59%	47.04%	65.22%	81.82%	88.24%	52.94%	.013	No
Psychosomatic symptoms (mean)	>.13	≤.13	67.65%	37.94%	65.22%	72.73%	83.33%	50.00%	.043	Yes
Psychosomatic symptoms (change)	≤-.42	>-.42	58.82%	29.64%	47.83%	81.82%	84.62%	42.86%	.097	No

Anxiety—child self-report (time 1)	>.43	≤.43	0.00%	-100.00%	0.00%	0.00%	0.00%	0.00%	1.00	No
Anxiety—child self-report (change)	>-.50	≤-.50	40.00%	-50.00%	50.00%	0.00%	66.67%	0.00%	1.00	No
Depression (time 1)	≤.39	>.39	27.27%	-27.78%	22.22%	50.00%	66.67%	12.50%	.945	No
Depression (change)	>-.39	≤-.39	20.00%	0.00%	0.00%	100.00%	--	20.00%	1.00	No
Post-traumatic stress (time 1)	>.20	≤.20	54.55%	5.56%	55.56%	50.00%	83.33%	20.00%	.727	No
Post-traumatic stress (change)	≤-.40	>-.40	50.00%	0.00%	50.00%	50.00%	80.00%	20.00%	.778	No
Sexual concerns (time 1)	>.35	≤.35	9.09%	-50.00%	0.00%	50.00%	0.00%	10.00%	1.00	No
Sexual concerns (change)	≤.00	>.00	70.00%	25.00%	75.00%	50.00%	85.71%	33.33%	.533	No
Exposure to physical conflict (time 1)	>1.89	≤1.89	54.55%	5.56%	55.56%	50.00%	83.33%	20.00%	.727	No
Exposure to community violence (time 1)	>1.66	≤1.66	9.09%	-50.00%	0.00%	50.00%	0.00%	10.00%	1.00	No
Therapeutic alliance/ engagement in treatment (time 1)	≤3.56	>3.56	72.73%	27.27%	90.91%	36.36%	74.07%	66.67%	.078	Yes
Coping/ emotion regulation (time 1)	≤1.50	>1.50	33.33%	-18.18%	18.18%	63.64%	50.00%	28.00%	.941	No
Coping/ emotion regulation (change)	≤1.36	>1.36	67.86%	18.89%	88.89%	30.00%	69.57%	60.00%	.228	No
Exposure to sexuality (time 1)	0, 1	2	63.64%	-22.22%	77.78%	0.00%	77.78%	0.00%	1.00	No
Number of placements (time 1)	≤5	>5	52.94%	-12.25%	69.57%	18.18%	64.00%	22.22%	.882	No

Sexual deviance/ sexual offender interventions (time 1)	>3.21	≤3.21	30.30%	-9.09%	0.00%	90.91%	0.00%	31.25%	1.00	No
Sex education (time 1)	>1.30	≤1.30	71.43%	43.32%	70.59%	72.73%	80.00%	61.54%	.031	Yes
Education about sexual behaviors (time 1)	>3.67	≤3.67	37.93%	0.00%	0.00%	100.00%	--	37.93%	1.00	No
Therapist theoretical orientation (time 1)	Cognitive-behavioral	Other	78.79%	36.36%	100.00%	36.36%	75.86%	100.00%	.008	Yes

As with the full sample, multivariate Optimal Data Analysis was conducted at experiment-wise alpha levels of .05, .10, and .15, resulting in an unpruned, pruned, and enumerated classification tree for each. Table 6 displays the overall effect strengths for sensitivity and the minimum number of observations in the subgroups formed by each tree. Using the criteria outlined above (i.e., lowest alpha, highest minimum denominator, and highest effect strength for sensitivity), the enumerated tree pruned at $p = .10$ was selected as the final multivariate model for the change sample.

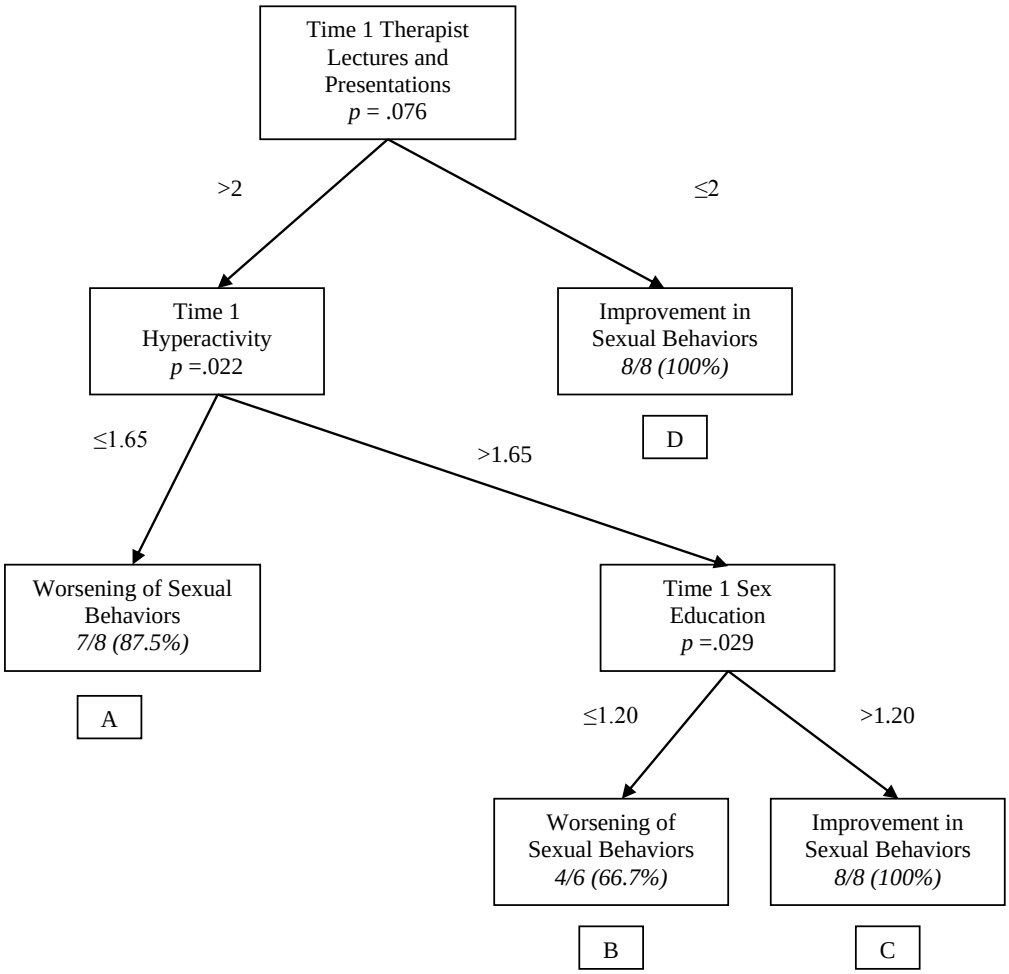
Table 6. Effect Strength for Sensitivity (ESS) and Minimum Denominators for Multivariate Optimal Data Analysis Classification Trees: Change Sample

p Value	Unpruned	Pruned	Enumerated
ESS			
.05	88.2%	No tree	54.6%
.10	88.2%	43.3%	**84.2%**
.15	88.2%	55.1%	84.2%
Minimum Denominator			
.05	2	No tree	4
.10	2	13	**6**
.15	2	2	6

Note: ESS and minimum denominator values for the selected model are in boldface.

In this model, the treatment variable of therapist lectures or presentations emerged as the optimal predictor of children's classification status and entered the analysis first (See Figure 4). Children with scores of 1 or 2 (i.e., more frequent use of lectures or presentations) were predicted to display improvement in their sexual behaviors (See node D.) This subgroup's classification status was predicted with 100% accuracy; thus, no further analysis was required.

Figure 4. Optimal Data Analysis results for predictors of improvement versus worsening in sexual behaviors in the change sample of children with sexual behavior problems.



Note: Change scores were computed by subtracting scores at time 1 from scores at time 2. Overall classification accuracy was 90.0%. Effect strength for sensitivity was 84.2%.

Children with therapist lectures or presentations scores of 3 or 4 (i.e., less frequent use of this treatment technique) were predicted to exhibit worsened sexual behaviors. For this subgroup of children, the next best predictor of their classification status was their hyperactivity symptoms at time 1. Children with symptom scores less than or equal to

1.65 were predicted to exhibit worse sexual behaviors over time. No other variables provided further significant classification of this subgroup. Classification status for children in this subgroup was predicted with 87.5% accuracy (See node A.).

Among children with time 1 hyperactivity scores greater than 1.65, frequency of sex education in therapy was the next significant predictor of classification status. Children with sex education scores less than or equal to 1.20 were predicted to show worsening of their sexual behaviors. No other variables were significant predictors of this subgroup's classification status, which was predicted with 66.7% accuracy (See node B.). Children with sex education scores greater than 1.20 were predicted to show improvements in their sexual behaviors. For this subsample, no further analysis was necessary, as their classification status was predicted with 100% accuracy (See node C.).

Overall classification accuracy for the CTA model was 90.0%. Effect strength for sensitivity of the model was 84.2%. This is considered a strong effect (Yarnold & Soltysik, 2005). Sensitivity and specificity for prediction of improvement in sexual behaviors were 84.2% and 100%, respectively. For prediction of worsened sexual behaviors, sensitivity was 100%, while specificity was 78.6%.

Post-Hoc Analyses

To facilitate improved understanding of the results of the final multivariate CTA models, post-hoc analyses were conducted comparing the subgroups on key variables, including gender, maltreatment history, time 1 sexual behaviors, measures of child functioning, and treatment provider theoretical orientation.

Full Sample

The results of one-way ANOVAs indicated that the six subgroups (i.e., nodes) of children differed significantly with respect to their sexual behaviors (as measured by the CSBI) at time 1, $F(5, 108) = 9.55$, $p < .001$. Table 7 shows mean sexual behavior scores for each group.

Table 7. Time 1 Mean CSBI Scores across Subgroups Identified by Optimal Data Analysis: Full Sample

Group (*N*)	Classification Status	Mean (SD)	Min./Max.
A (60)	Worse/No Change	.17 (.22)	.00/.74
B (13)	Worse/No Change	.28 (.36)	.05/1.11
C (9)	Worse/No Change	.44 (.45)	.11/1.34
D (6)	Improved	.63 (.27)	.34/1.09
E (11)	Worse/No Change	.37 (.28)	.02/.89
F (15)	Improved	.88 (.79)	.00/2.68

Chi-square tests were conducted to compare the subgroups based on gender, history of maltreatment (physical abuse, serious physical abuse, sexual abuse, neglect, and physical neglect), and treatment provider theoretical orientation (cognitive-behavioral versus other). Likelihood ratio statistics were examined due to small expected cell values. The groups differed significantly as to the proportion of each whose mental healthcare providers endorsed a cognitive-behavioral treatment orientation, $\chi^2(5, N = 108) = 18.49$, $p < .01$. Within the subset of children for whom this information was reported, the percentages of children in groups A through F whose treatment providers endorsed

cognitive-behavioral orientations were 87.5%, 81.8%, 100%, 100%, 36.4%, and 86.7%, respectively. No other significant between-group differences were identified.

One-way ANOVAs were also conducted to compare measures of child functioning (i.e., symptom measures, coping and emotion regulation, and social and emotional functioning) across the six subgroups. Table 8 displays the results of these analyses. Significant between-group differences were identified for 10 of the 11 measures: caregiver reports of anxiety, psychosomatic, conduct, impulsive-hyperactive, and hyperactive symptoms; child reports of sexual concerns and symptoms of anxiety and depression; and mental healthcare provider reports of coping and emotion regulation and social and emotional competence (all p's < .05). A marginally significant between-group difference was found for child reports of post-traumatic stress symptoms (p < .10).

Table 8. Time 1 Child Functioning Scores across Subgroups: Full Sample

Group	Mean (SD)	*df*	*F*	*p*
Anxiety Symptoms		5, 108	4.56	.001
A	.55 (.53)			
B	.62 (.47)			
C	.97 (.15)			
D	1.00 (1.10)			
E	1.02 (.74)			
F	1.28 (.82)			
Psychosomatic Symptoms		5, 108	3.58	.005
A	.17 (.31)			
B	.12 (.24)			
C	.25 (.31)			
D	.33 (.44)			
E	.37 (.49)			
F	.63 (.74)			
Conduct Symptoms		5, 108	48.97	<.001
A	.74 (.42)			
B	2.14 (.33)			
C	2.20 (.26)			

D	2.11 (.37)			
E	1.84 (.62)			
F	2.01 (.60)			
Impulsive-Hyperactive Symptoms		5, 108	22.39	<.001
A	1.06 (.71)			
B	1.98 (.53)			
C	2.17 (.28)			
D	1.38 (.61)			
E	2.48 (.69)			
F	2.57 (.46)			
Hyperactive Symptoms		5, 108	24.67	<.001
A	.88 (.56)			
B	1.82 (.50)			
C	1.77 (.34)			
D	1.53 (.44)			
E	2.28 (.49)			
F	2.10 (.61)			
Anxiety Symptoms—Child Self-Report		5, 60	3.82	.005
A	.61 (.48)			
B	.53 (.52)			
C	1.48 (.31)			
D	.74 (.25)			
E	.86 (1.36)			
F	.97 (1.10)			
Depression Symptoms—Child Self-Report		5, 60	4.25	.002
A	.59 (.44)			
B	.32 (.19)			
C	1.10 (.27)			
D	.98 (.38)			
E	1.22 (1.58)			
F	1.02 (.90)			
Post-Traumatic Stress Symptoms—Child Self-Report		5, 60	2.28	.058
A	.74 (.56)			
B	.52 (.61)			
C	1.36 (.54)			

D	1.07 (.40)			
E	1.17 (1.59)			
F	1.02 (.91)			
Sexual Concerns—Child Self-Report		5, 60	3.62	.006
A	.35 (.30)			
B	.35 (.35)			
C	.71 (.58)			
D	.57 (.30)			
E	.23 (.40)			
F	1.14 (1.05)			
Coping Skills/Emotion Regulation		5, 101	2.50	.035
A	2.40 (.64)			
B	1.97 (.55)			
C	1.70 (.52)			
D	2.07 (.73)			
E	2.17 (.64)			
F	2.08 (.79)			
Social/Emotional Competence		5, 108	8.04	<.001
A	1.38 (.30)			
B	.97 (.25)			
C	.96 (.11)			
D	1.05 (.27)			
E	1.06 (.35)			
F	1.17 (.32)			

Change Sample

The results of a one-way ANOVA indicated that time 1 sexual behaviors differed significantly across the four subgroups, $F(3, 26) = 3.04$, $p < .05$. Table 9 displays mean sexual behavior scores for each group.

Table 9. Time 1 Mean CSBI Scores across Subgroups Identified by Optimal Data Analysis: Change Sample

Group (*N*)	Classification Status	Mean (SD)	Min./Max.
A (8)	Worse	.30 (.51)	.00/1.53
B (6)	Worse	.88 (.70)	.11/1.92
C (8)	Improved	1.22 (.81)	.42/2.68
D (8)	Improved	.92 (.41)	.42/1.66

As in the full sample, likelihood ratio chi-square tests were conducted to compare the subgroups based on gender, history of maltreatment, and treatment provider theoretical orientation. The four groups differed significantly in the proportion of each whose treatment providers endorsed a cognitive-behavioral treatment orientation, $\chi^2(3, N = 30) = 9.21$, $p < .05$. The percentages of children in groups A through D whose mental healthcare providers endorsed cognitive-behavioral orientations were 87.5%, 50.0%, 100%, and 100%, respectively. No other significant group differences were identified.

One-way ANOVAs were conducted to compare the four subgroups on measures of child functioning (See Table 10). Significant between-group differences were found on caregiver-reported measures of anxiety, conduct, impulsive-hyperactive, and hyperactive symptoms and on mental healthcare provider-reported coping skills and emotion regulation (all p's < .05). No other significant between-group differences were identified.

Table 10. Time 1 Child Functioning Scores across Subgroups: Change Sample

Group	Mean (SD)	*df*	*F*	*p*
Anxiety Symptoms		3, 26	3.70	.024
A	.38 (.30)			
B	.83 (.74)			
C	1.25 (.78)			
D	1.50 (.93)			
Psychosomatic Symptoms		3, 26	.56	.644
A	.29 (.48)			
B	.29 (.51)			
C	.50 (.78)			
D	.63 (.57)			
Conduct Symptoms		3, 26	5.15	.006
A	1.13 (.62)			
B	2.13 (.52)			
C	2.05 (.57)			
D	1.94 (.53)			
Impulsive-Hyperactive Symptoms		3, 26	9.17	<.001
A	1.41 (.44)			
B	2.88 (.21)			
C	2.41 (.48)			
D	2.03 (.81)			
Hyperactive Symptoms		3, 26	10.28	<.001
A	1.15 (.45)			
B	2.42 (.47)			
C	2.18 (.37)			
D	1.81 (.55)			
Anxiety Symptoms—Child Self-Report		2, 7	.48	.637
A	.43 (.40)			
B	--			
C	1.04 (1.09)			
D	.68 (.29)			
Depression Symptoms—Child Self-Report		2, 7	.16	.854
A	.72 (.08)			
B	--			

C	.86 (.70)			
D	.97 (.34)			
Post-Traumatic Stress Symptoms—Child Self-Report		2, 7	1.13	.377
A	.50 (.57)			
B	--			
C	1.25 (.83)			
D	.85 (.17)			
Sexual Concerns—Child Self-Report		2, 7	1.19	.360
A	.15 (.21)			
B	--			
C	1.13 (1.07)			
D	.75 (.30)			
Coping Skills/Emotion Regulation		3, 26	3.91	.020
A	2.68 (.44)			
B	1.79 (.22)			
C	2.20 (.70)			
D	2.09 (.46)			
Social/Emotional Competence		3, 26	2.27	.104
A	1.36 (.22)			
B	1.01 (.24)			
C	1.12 (.34)			
D	1.07 (.29)			

CHAPTER VIII

DISCUSSION

This study sought to expand knowledge of predictors of changes in sexual behaviors among children in the child welfare system with sexual behavior problems. Currently, studies of changes in sexual behavior problems over time are limited and consist primarily of treatment studies. Thus, little is known regarding the characteristics of children or their environments that may predict the course of sexual behavior problems. By examining treatment variables in conjunction with child and environmental attributes, this study offers a more comprehensive view of the course of problematic sexual behaviors. This study also broadens the existing literature on children's sexual behavior problems by addressing several other limitations of previous studies through the use of multiple sources of data (including children's self-reports), a broader age range compared to many previous longitudinal studies, and the inclusion of a broader range of predictor variables, such as change in children's functioning (e.g., psychological symptoms, interpersonal functioning) and environments (i.e., parenting practices). Moreover, the use of Optimal Data Analysis (ODA) and Classification Tree Analysis via ODA, an exploratory technique designed specifically to unearth the ways in which variables interact to predict outcome, allowed for the inclusion of a large number of variables and for an advance in the understanding of moderators of change in sexual behavior problems.

Full Sample

The first set of analyses in this study examined predictors of reliable improvement in children's sexual behaviors versus no change or reliable worsening in their behaviors. Univariate analyses revealed that children's initial symptom levels, as well as improvements in their symptoms over time, were the strongest predictors of decreases in their sexual behaviors. High initial levels of both internalizing (i.e., psychosomatic) and externalizing (i.e., conduct, hyperactive, and impulsive-hyperactive) symptoms were associated with improvements in children's sexual behaviors. These findings provide further evidence for the relevance of psychosomatic and externalizing symptoms to the course of sexual behavior problems found in previous research (Lévesque et al., 2012). However, they differ from previous results in that Lévesque and colleagues (2012) found that more severe psychosomatic and externalizing symptoms were significant concurrent predictors of persistence of sexual behavior problems, yet they found no influence of initial symptom levels on changes in sexual behaviors over time. In the present study, the finding that higher symptom levels were associated with improvements in sexual behaviors may initially appear counterintuitive. However, given the many factors that can contribute to children's sexual behavior problems (Elkovitch et al., 2009; Grant & Lundeberg, 2009), it may be more informative to examine these symptoms in combination with other variables, rather than in isolation.

Furthermore, in order to understand the course of children's sexual behaviors, it is important to consider possible influences of changes in children's internalizing and externalizing problems. Consistent with the notion that sexual behavior problems are

associated with externalizing problems in general (Lévesque et al., 2012; see Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review) and with impulsivity in particular (Baker et al., 2002; see Swisher et al., 2008), greater decreases in symptoms of impulsivity-hyperactivity among the children in the present sample predicted improvement in sexual behaviors. The influence of changes in impulsivity on the course of sexual behavior problems is further supported by evidence that inclusion of instruction in self-control skills (i.e., learning to control impulsive behaviors and thoughts, engage in appropriate decision-making, and solve problems) had a significant effect on treatment outcomes for children with sexual behavior problems across a number of studies (St. Amand et al., 2008). Thus, it appears that increasing children's ability to regulate their impulses may be an important target for intervention.

As expected in light of the association between children's sexual behaviors and internalizing symptoms (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009), as well as evidence that symptoms related to post-traumatic stress disorder are associated with intrusive sexual behaviors (Friedrich et al., 2003), decreases in children's psychosomatic symptoms and sexual concerns also predicted improvement in their sexual behaviors. Sexual preoccupation, including rumination and compulsive sexual behaviors, is common among children with sexual behavior problems (See Grant & Lundeberg, 2009). Thus, as children's focus on sex and their negative reactions to sexual content (for instance, having unwanted thoughts about sex, experiencing distress in response to thoughts or discussion about sex; Briere, 1996) decline, it is expected that their sexual behaviors would decrease to more developmentally appropriate levels as well. Future

research should examine whether decreased sexual concerns mediate improvements in sexual behavior problems.

In contrast to findings from previous longitudinal research on sexual behavior problems (Lévesque et al., 2012), this study did not identify significant effects of age or exposure to sexuality on changes in sexual behaviors. A study of low-income, African-American children found that sexual behaviors increase between the ages of 10 and 12 (Thigpen, 2009). Thus, whereas Lévesque and colleagues (2012) found that younger children were more likely to exhibit persistent sexual behavior problems, any effect of age in the current study may have been countered by normative increases in sexual behaviors among the older children in the sample. The absence of an effect of exposure to sexuality on the course of children's sexual behaviors may be due to the way in which this construct was assessed in the present study. Children were asked to respond to two items pertaining to their lifetime exposure to pornography. Because only older children in the sample provided self-reports, there may have been insufficient power to detect an effect for this measure. Furthermore, exposure to sexuality is a broad construct that captures several aspects of the home environment (e.g., nudity, co-bathing) in addition to exposure to pornography (e.g., Friedrich et al., 1998; Friedrich et al., 2001). A broader measure that more specifically assessed sexuality within children's home environments throughout the duration of the study may have been a more informative predictor of children's behaviors.

In addition to child characteristics, treatment variables, including a cognitive-behavioral orientation towards treating sexual behavior problems and more frequent use

of therapist lectures and presentations and modeling of behaviors in individual therapy were also associated with improvements in children's sexual behaviors. The benefits of cognitive-behavioral therapy for children with sexual behavior problems are supported by the ATSA Task Force on Children with Sexual Behavior Problems' conclusion that cognitive-behavioral therapy is the treatment of choice for this population (Chaffin et al., 2008) and by previous research with the larger sample on which this study is based, which found that therapist endorsement of a cognitive-behavioral approach was associated with decreased sexual behaviors (Sieracki et al., 2008). The technique of therapist modeling of behaviors is consistent with a behavioral approach to treatment and may be related to components of effective treatments for sexual behavior problems, such as development of social skills and strategies to improve coping and self-control (Chaffin et al., 2008; St. Amand et al. 2008). Furthermore, therapists' use of lectures and presentations may reflect an emphasis on psychoeducation and attention to such apparently beneficial treatment elements as discussing rules for physical boundaries and sexual behavior, safety and prevention of sexual abuse, and sex education (Chaffin et al., 2008).

While the univariate results point to the variables that were significant predictors of changes in sexual behaviors for the sample as a whole, the findings of the multivariate analyses and post-hoc analyses help to identify subgroups of children for whom specific variables are most relevant. As previously noted, impulsivity has been associated with sexual behavior problems (Baker et al., 2002; see Swisher et al., 2008), and attention-deficit/hyperactivity disorder, which is characterized by impulsivity (American

Psychiatric Association, 2013), is common among children with sexual behavior problems (See Grant & Lundeberg, 2009). Additionally, it has been suggested that relatively higher levels of impulsivity may partly account for the greater frequency of sexual behaviors among young children (Grant & Lundeberg, 2009). Thus, it is not surprising that declines in children's impulsive-hyperactive symptoms predicted decreased sexual behaviors over time. Additional variables which significantly predicted the course of children's sexual behaviors emerged within the multivariate classification model, resulting in the identification of six subgroups, each of which will be discussed in turn.

Children in Group A were predicted to demonstrate worsening or no change in their sexual behaviors. Significant predictors of membership in this group included less improvement or worsening of impulsive-hyperactive symptoms and low initial conduct symptoms. The association between lack of improvement in impulsivity and stable or worsening sexual behaviors is consistent with the previously discussed association between impulsivity and sexual behavior problems (Baker et al., 2002; see Swisher et al., 2008); however, the finding that low conduct symptoms predicted worsening or no change in sexual behaviors in this group at first appears contradictory to prior research indicating that externalizing problems are associated with sexual behaviors (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review) and with the persistence of sexual behaviors (Lévesque et al., 2012). However, post-hoc analyses revealed that Group A is a relatively well-adjusted group. Specifically, their mean initial sexual behaviors were comparatively low (although still well above the means reported for

normative samples; see Friedrich et al., 2001 and Thigpen & Fortenberry, 2009). Moreover, their initial levels of internalizing, externalizing, and trauma symptoms were relatively low, while their social and emotional competence and coping skills and emotion regulation abilities were the highest of all groups. Additionally, the vast majority of children in this group had therapists who endorsed a cognitive-behavioral approach to working with youth with sexual behavior problems. Thus, the apparent lack of improvement in sexual behaviors within this group appears to be a result of a floor effect, in which the possibility of demonstrating statistically reliable improvement was limited by low initial sexual behaviors (The mean of initial sexual behaviors for this group was lower than the amount of change in sexual behaviors required to demonstrate reliable improvement, so such improvement was not possible for many children in this group.).

Children in Group B were also predicted to demonstrate increases or no change in their sexual behaviors. Significant predictors of classification status for this group included less improvement or worsening in impulsive-hyperactive symptoms, higher initial conduct symptoms, and lower initial depressive symptoms. Based on post-hoc analyses, this group can be described as a high externalizing group characterized by high initial symptoms of conduct problems, impulsivity-hyperactivity, and hyperactivity. The majority of children's therapists endorsed a cognitive-behavioral approach to treatment. On average, this group exhibited somewhat more severe initial sexual behaviors compared to group A, with their mean CSBI score approaching that of Friedrich and colleagues' (2001) sample of sexually abused children. The finding that higher conduct symptoms predicted a lack of improvement in sexual behaviors is consistent with the

aforementioned association between sexual behaviors and externalizing symptoms (Lévesque et al., 2012; see Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review), as well as with evidence that conduct disorder and other disruptive behavior disorders commonly co-occur with sexual behavior problems (See Grant & Lundeberg, 2009). Moreover, the presence of high levels of a variety of externalizing symptoms within this subgroup is consistent with the notion that sexual behavior problems can be part of a broader set of problematic behaviors, rather than an isolated or unique concern (Elkovitch et al., 2009; Grant & Lundeberg, 2009).Thus, it appears that despite the high frequency of treatment with cognitive-behavioral therapy among children in this group, their severe, broad range of externalizing symptoms may have hindered improvement in their sexual behaviors, particularly as a result of insufficient decreases in impulsive-hyperactive symptoms. This explanation must be qualified, however, by the fact that as in Group A, the mean initial CSBI score in this group was lower than the amount of change in sexual behaviors required to demonstrate reliable change; therefore, some children in this group were precluded from categorization as improved.

For Group C, the combination of less improvement or worsening of impulsivity-hyperactivity and the presence of more severe initial conduct symptoms and child-reported depressive and anxiety symptoms predicted children's classification as demonstrating worsening or no change in their sexual behaviors. Based on these predictors and the descriptive post-hoc analyses, this group can be characterized as a having both notable externalizing and internalizing symptoms. Furthermore, their initial sexual behaviors were more severe than those of either of the previous groups, with a

mean that exceeded that reported for Friedrich et al.'s (2001) sexual abuse sample. The findings for Group C indicate that sexual behaviors did not reliably improve despite universal endorsement of a cognitive-behavioral approach to treatment by therapists for these children, which is generally expected to be beneficial (Chaffin et al., 2008). Thus, it appears likely that the broad internalizing and externalizing symptomatology evident among these children contributed to the persistence of their sexual behaviors while possibly making them less responsive to treatment (as suggested by their limited declines in impulsive-hyperactive symptoms). This may suggest that for children with both severe sexual behaviors and combined internalizing and externalizing symptoms, it may be beneficial to provide more comprehensive treatment, such as multisystemic therapy, which has demonstrated positive outcomes for children with significant behavior problems (See Henggeler, 1999 for review). This suggestion is consistent with evidence that increased social, mental health, and family problems are observed among children with more severe sexual behavior problems (Hall, Mathews, Pearce, Sarlo-McGarvey, & Gavin, 1996, as cited in Chaffin et al., 2008).

Children in Group D were predicted to show improvement in their sexual behaviors despite experiencing less improvement or worsening of impulsivity-hyperactivity and having higher conduct and child-reported depressive symptoms. Unlike in Group C, membership in this subgroup was associated with lower child-reported symptoms of anxiety, yet children in Group D resembled those in Group C insofar as they demonstrated notable levels of both internalizing and externalizing symptoms. Sexual behaviors at time 1 were somewhat higher in this group compared to children in Group C.

Thus, while some of the improvement in sexual behaviors in Group D may be the result of regression to the mean, the positive outcome predicted for this group may be better understood in relation to Group C. Higher conduct and depressive symptoms were significant predictors of classification status for both of these groups, but in Group C, higher anxiety symptoms were associated with worsening or no change in sexual behaviors; in contrast, Group D's lower anxiety symptoms predicted improvement in sexual behaviors. Consistent with prior research indicating that comorbidity is associated with greater symptom severity and impairment (See Angold, Costello, & Erkanli, 1999 for review) and with evidence that in adolescents, outcomes in some areas worsen with increased numbers of diagnoses (Lewinsohn, Rohde, & Seeley, 1995), it may be that children in Group D were relatively responsive to treatment due to their lower levels of anxiety, whereas those in Group C were more resistant due to their increased number of mental health difficulties.

For children in Group E, greater improvement in impulsive-hyperactive symptoms in conjunction with less sex education during therapy predicted worsening or no change in sexual behaviors. Children in this group exhibited sexual behaviors comparable in severity to those of Friedrich and colleagues' (2001) sexually abused sample, and they were also highly impulsive and hyperactive. Conduct, depressive, anxiety, and post-traumatic stress symptoms were also notable in this group. In contrast to the other subgroups in this sample, only a minority of children in this group had therapists who endorsed a cognitive-behavioral approach to treatment. Together, the results for this subgroup suggest that despite the apparent contributions of impulsivity to

sexual behaviors (Baker et al., 2002; Grant & Lundeberg, 2009; see Swisher et al., 2008), improvement in these symptoms is insufficient to resolve problematic sexual behaviors. Both cognitive-behavioral therapy and sex education appear to be important for treating sexual behavior problems (Chaffin et al., 2008; St. Amand et al., 2008). Likewise, cognitive-behavioral approaches have been demonstrated to be effective in addressing post-traumatic, anxious, and depressive symptoms (See Cohen, Mannarino, Berliner, & Deblinger, 2000 and Compton et al., 2004 for review). Given the recommendation to treat underlying symptoms in children with sexual behavior problems while incorporating treatment components targeted towards sexual behaviors (Chaffin et al., 2008), the relative lack of both cognitive-behavioral therapy and sex education may have led to limited improvement in children's internalizing symptoms (which may have contributed to the maintenance of sexual behaviors) as well as their sexual behaviors. Furthermore, because initial impulsive symptoms were so high in this group, the improvement in these symptoms may have been insufficient. As in Groups A and B, however, it is also important to consider that the mean CSBI score for children in Group E at time 1 was lower than the amount of change in sexual behaviors required to demonstrate improvement.

Finally, in Group F, greater improvement in impulsive-hyperactive symptoms and greater use of sex education in treatment predicted improvement in children's sexual behaviors. Children in this group had the highest initial levels of sexual behaviors within the sample; they also exhibited significant externalizing (particularly impulsive-hyperactive) symptoms, as well as a variety of internalizing symptoms, including

relatively more severe sexual concerns compared to the other groups of children. The majority of the children in this group had therapists who used cognitive-behavioral therapy. For children in this group, high levels of sexual concerns may reflect the sexual preoccupation often observed in children with sexual behavior problems (See Grant & Lundeberg, 2009); when combined with these children's high levels of impulsivity, they may have had difficulty controlling their sexual behaviors. Thus, for these children, the reduction in impulsive-hyperactive symptoms may have been particularly beneficial. Given the high levels of sexual concerns among children in this group, the inclusion of sex education in treatment may have been especially important. Although the wording of the therapist questionnaires did not specify which modality of treatment (e.g., individual, family) included sex education, it is possible that sex education helped to normalize children's sexual feelings and behaviors, thereby decreasing any distress that they may have experienced related to sexuality. Furthermore, because traumatic sexualization of sexually abused children has been associated with developmentally inappropriate sexual knowledge (See Finkelhor & Browne, 1985), the provision of age-appropriate sex education may help to alleviate sexual concerns.

Change Sample

Although only a small subset of the full sample was included in analyses of children who demonstrated reliable changes in their sexual behaviors, the discrepancies between these results and those found in the full sample suggest the importance of examining children whose sexual behaviors worsened as a distinct group, rather than collapsing the "worse" and "no change" groups. Nonetheless, the similarities between the

results of the analyses for the full and change samples provide greater support for the relevance of the predictors of changes in children's sexual behaviors.

As in the full sample, univariate analyses indicated that both child functioning and treatment variables significantly predicted children's classification status. However, contrary to expectations, no variables reflecting changes in child functioning were significant. In addition to therapists' reports of a cognitive-behavioral treatment orientation and greater use of lectures and presentations, which predicted improvement in the full sample as well, therapists' reports of greater inclusion of sex education in treatment were associated with improvement in children's sexual behaviors. Thus, while the effect of sex education revealed in the full sample multivariate analyses suggests that sex education may be particularly relevant for a subset of children, the univariate effect that emerged in the change sample suggests that sex education may be more broadly beneficial for children with sexual behavior problems. This is consistent with evidence that sex education for children is a component of effective cognitive-behavioral approaches to treating sexual behavior problems (Chaffin et al., 2008).

With regard to child functioning variables, higher somatic symptoms again predicted improvements in children's sexual behaviors, as did caregiver-reported anxiety symptoms. Consistent with the notion that internalizing symptoms and sexual behavior problems can co-occur (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review), in this sample, the groups with the highest initial levels of these two types of symptoms also exhibited the most severe sexual behaviors at the start of the study and were predicted subsequently to demonstrate improvement in their sexual behaviors. Thus,

the seemingly counterintuitive finding that more severe psychosomatic and anxious symptoms predicted improvement may be accounted for by decreases in sexual behaviors due to regression to the mean, with initial symptom severity acting as a proxy for severity of sexual behaviors. Unlike in the full sample, though, no externalizing symptoms were significant predictors of classification status. It may be that the comparatively greater severity of externalizing symptoms within this sample resulted in them being less informative than internalizing symptoms in distinguishing between children whose sexual behaviors improved and those whose became worse.

In the multivariate analyses, therapist lectures and presentations emerged as the optimal predictor of classification status, with more frequent use of these treatment components predicting improvement in sexual behaviors. As previously noted, the incorporation of lectures and presentations into treatment may reflect an emphasis on psychoeducation, which appears to be an important aspect of treatment for sexual behavior problems (Chaffin et al., 2008). For children in Group D, therapist lectures and presentations were the only significant predictor of classification status. At the start of the study, children in this group exhibited high levels of externalizing symptoms, as well as notable caregiver-reported anxiety symptoms. Children in this group had initial levels of sexual behaviors that were over twice as high as those of the children in Friedrich et al.'s (2001) sexual abuse sample. All children in this group had therapists who endorsed a cognitive-behavioral treatment orientation. Thus, the apparent benefits of lectures and presentations for children in this group, in spite of their relatively severe sexual behaviors

and comorbid symptoms, provide further support for the inclusion of educational content in the treatment of sexual behavior problems.

The remaining groups of children in this sample all had therapists who reported less frequent use of presentations and lectures. For children in Group A, this treatment variable, combined with less severe initial hyperactive symptoms, predicted worsening of sexual behaviors over time. Children in this group had notable, but not highly severe, externalizing symptoms, and nearly all had therapists who reported using a cognitive-behavioral approach to treatment. Initial levels of sexual behaviors were comparatively low in this group, despite approaching that of Friedrich and colleagues' (2001) sample of sexually abused children; therefore, despite the clear severity of sexual behaviors among children in this group, "improvement" was not possible for some of them due to the way that this term was defined. Nonetheless, it is important to consider why children in Group A demonstrated more severe sexual behaviors over time, rather than maintaining stable levels of these behaviors, particularly in the presence of positive factors such as only moderate-to-mild symptom severity and involvement in cognitive-behavioral therapy. The less frequent use of lectures and presentations in this group may indicate that children received less psychoeducation (e.g., rules for physical boundaries and sexual behavior), which appears to be a key aspect of treatment (Chaffin et al., 2008).

For children in Group B, the combination of less frequent therapist lectures and presentations, more severe symptoms of hyperactivity, and less frequent discussion of sex education during therapy predicted worsening of sexual behaviors. Children in this group exhibited high initial levels of sexual behaviors (similar to the mean reported for Group

D). Caregiver reports also indicated that they had severe externalizing symptoms. Furthermore, only half of the children in Group B had therapists who endorsed a cognitive-behavioral approach to treatment. No self-reports of symptoms were available for this group, indicating that the children were under 10 years of age at the start of the study. Therefore, the finding that this group was predicted to experience increased sexual behaviors over time is consistent with research demonstrating that persistence of sexual behavior problems is more likely among younger children (Lévesque et al., 2012). This group's clinical presentation is consistent with the view of sexual behavior problems as just one manifestation of a wider variety of problematic behaviors (Elkovitch et al., 2009; Grant & Lundeberg, 2009). Overall, children in Group B were less likely to receive apparently effective treatment for their sexual behavior problems (i.e., cognitive-behavioral therapy, sex education). The increased severity of their sexual behaviors over the course of the study highlights the importance of these treatment approaches, particularly for children with such poor adjustment and severe sexual behaviors.

Finally, children in Group C, who had the most severe initial sexual behaviors within this sample, were predicted to exhibit improved sexual behaviors over time. For this group, less frequent therapist lectures and presentations, more severe hyperactive symptoms, and more frequent inclusion of sex education in treatment were significant predictors of classification status. Children in this group were characterized by significant externalizing symptoms as well as less severe, but still notable, internalizing symptoms, including post-traumatic stress, sexual concerns, and anxiety. All therapists for this group endorsed a cognitive-behavioral treatment approach. While regression to the mean may

have contributed to the decline in these children's severe sexual behaviors, these children also likely benefited from receiving cognitive-behavioral therapy in conjunction with sex education. As previously suggested, sex education may have been particularly important in addressing sexual concerns, while cognitive-behavioral therapy was likely beneficial for reducing post-traumatic stress symptoms. Presumably, treating these underlying difficulties helped to ameliorate children's sexual behavior problems due to associations between comorbid symptoms and sexual behaviors.

Summary of Results

For both samples in the present study, child functioning variables (both internalizing and externalizing symptoms) and treatment variables (particularly sex education, therapist lectures and presentations, and treatment orientation) emerged as significant predictors of children's classification status. Contrary to the predictions of an ecological-transactional framework (which, following the approach of Elkovitch et al., 2009, was used to conceptualize variables thought to be associated with changes in sexual behavior problems), predictors at the environmental, or microsystem, level appeared to be less relevant. As a result, it was not possible to identify predictors at the mesosystem level, since no interactions between environmental predictors were observed in the multivariate results.

The absence of significant effects for environmental predictors is somewhat contradictory to the results of a previous longitudinal study, which found that exposure to family sexuality, but not experiences of maltreatment, was associated with persistent sexual behavior problems (Lévesque et al., 2012). Moreover, cross-sectional research

provides substantial evidence of associations between characteristics of a child's environment and the occurrence of sexual behavior problems (See Elkovitch et al., 2009 and Grant & Lundeberg, 2009 for review). As previously noted, the failure to find a significant effect of exposure to sexuality in the present study may be a result of methodological limitations. For the remaining environmental variables, however, the lack of effects may be due to the environmental instability experienced by youth in the child welfare system (See Jones & Wells, 2008 for review). On average, children in the present sample had experienced six placements at the outset of the study, suggesting that the influence of any one of those environments may be limited. Nonetheless, the role of the environment should not be discounted entirely, as children's environments influence psychopathology (See Mash & Dozois, 2003 for review), which in turn was found to be related to changes in sexual behavior problems. Future studies should examine the characteristics of children's placements throughout the course of their child welfare involvement to better understand environmental influences on their sexual behaviors.

The results of the current study also highlight associations between a variety of internalizing and externalizing symptoms and children's sexual behaviors. In the full sample, both initial symptom levels and decreases in symptoms were associated with improvements in sexual behaviors. Based on the overall pattern of symptoms, sexual behaviors, and classification status in this sample, it appears that changes in symptoms, rather than initial symptom levels, were the more meaningful predictors of changes in sexual behaviors. In contrast, in the change sample, only initial symptom levels (specifically, caregiver-reported anxious and psychosomatic symptoms), rather than

changes in symptoms, predicted children's classification status. In this group, it appears that psychosomatic and anxious symptoms co-occurred with more severe initial sexual behaviors, suggesting that regression to the mean may account for the predictive value of these symptoms. To help clarify these relations, future research should examine whether initial symptom levels significantly predict changes in sexual behaviors after controlling for the initial severity of sexual behaviors.

Contrary to expectations, very few variables reflecting changes in children's symptoms emerged as significant predictors of classification status; rather, initial symptom severity more often predicted change or lack thereof in children's sexual behaviors. Furthermore, although decreased psychosomatic and impulsive-hyperactive symptoms were both associated with improvements in sexual behaviors in the full sample, it is not possible to determine the timing of these changes relative to one another. At least in the case of impulsive-hyperactive symptoms, however, the notion that age-related decreases in impulsivity may account for normative declines in children's sexual behaviors (Grant & Lundeberg, 2009) suggests that a reduction in these symptoms may precede an improvement in problematic sexual behaviors. Nonetheless, future research should assess both sexual behaviors and symptom severity across multiple time points in order to clarify the relative timing of changes in these two areas.

The results also emphasize the benefits of providing education as part of clinical services for children with sexual behavior problems, which is consistent with other evidence of the value of psychoeducation for children and their caregivers (See Chaffin et al., 2008 and St. Amand et al., 2008). Sex education seemed to be of particular

importance, as it appeared in both multivariate models, although it is unclear whether this information was provided to children, their caregivers, or both. Notably, the cutpoints for sex education generated by the univariate and multivariate analyses suggest that reports of even relatively infrequent discussion of sex education were associated with improvements in sexual behaviors. Thus, while sex education seems to be a key aspect of treatment, it appears that it does not need to be a primary focus in order to be effective. The significant effects found for therapist lectures and presentations provide further evidence for the importance of education during therapy. However, because the content of the presentations and lectures was not specified, future research should seek to clarify the specific role that these techniques play in contributing to changes in children's sexual behaviors.

Although not a primary focus of the present study, the post-hoc analyses also expand upon previous efforts to describe distinct groups of children with sexual behavior problems (e.g., Pithers et al., 1998). Two main conclusions emerge from these findings. First, frequency of sexual behaviors, symptom severity, and adaptive functioning vary among children with sexual behavior problems, with some children even appearing to be relatively well-adjusted aside from their problematic sexual behaviors. Second, although the groups of children identified through the multivariate analyses exhibited different symptom profiles (e.g., primarily externalizing, combined internalizing and externalizing), no groups with predominantly internalizing symptoms were identified. This may suggest that the associations between sexual behavior problems and externalizing problems are stronger compared to those for internalizing symptoms

(Friedrich et al., 2001). Future studies should continue to examine associations between children's characteristics and predictors of changes in sexual behaviors in order to determine the most appropriate intervention targets for different groups of children.

Despite its aforementioned strengths, this study also has several limitations that should be acknowledged. First, as previously noted, the measure of exposure to sexuality used in this study may not have been overly narrow, as it only assessed exposure to pornography. Moreover, its focus on lifetime exposure, rather than sexuality within children's current environments, may have limited the predictive value of this construct. Although a previous study (Lévesque et al., 2012) found that exposure to sexuality was both a cross-sectional and a longitudinal predictor of persistent sexual behavior problems, future research should examine whether ongoing exposure to sexuality is more strongly associated with changes in children's sexual behaviors.

Other limitations of this study concern the sample size and characteristics. The relatively small proportions of children who exhibited statistically reliable increases or decreases in their sexual behaviors may have limited the power to detect significant effects of predictor variables, particularly in the smaller change sample. A less conservative criterion for determining change in sexual behaviors may have yielded additional significant results; however, the reliability of such findings may have been compromised. Additionally, while the use of child self-report data is a strength of this study, because questionnaires were only administered to children ages 10 and older at the start of the study, the sample size for these measures was limited. Future research should incorporate measures that are appropriate for younger children. Finally, although the

broad age range of the current sample is another strength of this study, it is inconsistent with the conceptualization of sexual behavior problems as occurring in children up to 12 years old (e.g., Chaffin et al., 2008) and with the intended age range of the CSBI (Friedrich et al., 1992). All children were under age 13 at disposition to the SACY program; however, some were 13 by the time they participated in the study. Despite the importance of examining problematic sexual behaviors as children develop into adolescents (Friedrich et al., 2003) and the publication of previous studies of sexual behaviors in both children and teenagers (e.g., McCrae, 2009; Szanto et al., 2012), it would be preferable to study older youth separately from younger children.

Finally, by examining interactions between child characteristics and treatment topics and techniques, this study provides a preliminary discussion of interactions between child characteristics and treatment variables. Similarly, previous research has found that child characteristics may influence the appropriateness of various treatments (Pithers et al., 1998).Consistent with the distillation and matching model, which emphasizes associations between treatment components and individual and contextual attributes (Chorpita, Daleiden, & Weisz, 2005, as cited in Chorpita & Daleiden, 2009), future research on sexual behavior problems should continue to examine the appropriateness of various treatment techniques and content for children with specific symptom presentations.

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