



Published in final edited form as:

*Appl Dev Sci*. 2013 ; 17(4): . doi:10.1080/10888691.2013.836033.

## Multiple Forensic Interviews During Investigations of Child Sexual Abuse: A Cost-Effectiveness Analysis

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### Abstract

In cases of suspected child sexual abuse (CSA) some professionals routinely recommend multiple interviews by the same interviewer because any additional details provided might improve decision-making and increase perpetrator convictions. We analyzed alternative policies about child interviewing to estimate the probability that a policy of all children receiving multiple interviews will increase criminal convictions and better protect children. Using decision analysis, we prepared a decision tree reflecting the structure through which a case of possible CSA passes through the health care, welfare, and legal systems with an estimated probability of conviction of the offender. We reviewed the CSA disclosure, criminal justice, and child welfare literature to obtain estimates for the median and range of rates for the steps of disclosure, substantiation, criminal charges, and conviction. Using the R statistical package, our decision analysis model was populated using literature-based estimates. Once the model was populated, we simulated the experiences of 1,000 cases at 250 sets of plausible parameter values representing different hypothetical communities. Multiple interviews increase the likelihood that an offender will be convicted by 6.1% in the average community. Simulations indicate that a policy in which all children seen for a CSA medical evaluation receive multiple interviews would cost an additional \$100,000 for each additional conviction. We estimate that approximately 17 additional children would need to be interviewed on more than one occasion to yield one additional conviction. A policy of multiple interviews has implications for the children, for the costs of care, for protecting other children, and for the risk of false prosecution.

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Sexually abused children may have trouble disclosing<sup>1</sup> their abuse despite the fact that the child's history may be the most important part of the diagnostic evaluation and may lead to conviction of the perpetrator(s) (Berkoff, Zolotor, Thackeray, Shapiro, & Runyan, 2008). The Child Sexual Abuse Accommodation Syndrome (CSAAS) model suggests that children

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\*Dr. Foster is deceased but led the statistical modeling process for this paper and we are grateful for his assistance with this project.

<sup>1</sup>Please note the authors use the term disclosure to describe children's statements about abuse. Initial disclosures are considered allegations of abuse, as it is possible that such statements can be false.

react to their sexual abuse in the form of secrecy, helplessness, entrapment and accommodation, delayed and unconvincing disclosure, and retraction (Summit, 1983). Sense of responsibility for abuse, shame and social stigma, and fear of the consequences for the perpetrator, self, siblings, or non-involved parent all may hinder a child's ability to disclose (Goodman-Brown, Edelstein, Goodman, Jones, & Gordon, 2003; Summit, 1983). Older children may further fear a parent's incarceration, siblings' removal from the home, or the loss of financial security (Block, Oran, Oran, Baumrind, & Goodman, 2010). Thus, children might not disclose abuse that has occurred for any of several reasons.

Traditional child sexual abuse (CSA) medical evaluations include a child being interviewed at least one time in a clinical setting prior to their physical evaluation (Runyan, 1993). However, interviewing certain subsets of children on more than one occasion can increase children's disclosures (Carnes, 2005; Carnes, Nelson-Gardell, Wilson, & Orgassa, 2001; Carnes, Wilson, & Nelson-Gardell, 1999; Gries, Goh, & Cavanaugh, 1996; La Rooy, Lamb, & Pipe, 2009), especially among younger children (3–4 years) (Gries et al., 1996). For example, Carnes and colleagues (2001) suggest that extended forensic interviews are especially needed for those children "who [do] not make clear statements to refute or confirm ... suspicions [of sexual abuse] during a single investigative interview" (p. 232). The use of multiple interviews enables children who have not disclosed but are suspected to have been sexually abused more than one opportunity to disclose (Faller & Nelson-Gardell, 2010; Faller, Cordisco-Steele, & Nelson-Gardell, 2010; LaRooy et al., 2009). This opportunity is important because many children will deny abuse when interviewed for the first time (Lyon, 2007). Multiple interviews can take place in several contexts including extended forensic evaluations. Research has been conducted on both repeated interviews as well as the extended forensic interviewing (National Children's Advocacy Center, ND). Certain professional societies and groups train interviewers to conduct multiple or extended forensic interviewing. The National Children's Advocacy Center website currently provides links to training in extended forensic interviewing. In this paper we refer to multiple interviews and do not distinguish between different types of multiple interviewing. For our analysis, we assume that multiple interviews will include only two interviews but in both research and practice multiple interviews may imply more than two interviews. We also assume that the same interviewer will conduct both interviews. In many cases the initial interview is used to establish rapport and collect basic demographic information while the second is used to investigate alleged abuse. Any child involved in the criminal justice system may face interviews by multiple professionals (e.g., by social workers, police, attorneys) but this paper addresses the forensic interview(s), usually by the same interviewer, that take place during an investigation, before a case is brought to the district attorney's office.

Training of the interviewer is important because it can strengthen the quality of the interview. Any interview (single or multiple) can be unreliable for a number of reasons. Evaluating the accuracy of memory reports for child sexual abuse is of particular concern because children can be more susceptible to suggestions than adults. As noted above, CSA reports can be difficult to obtain because of the potential traumatic nature of the event itself and because of the fears associated with the disclosure itself (e.g., families being separated). The quality of an interview is crucial when evaluating its reliability. In fact, critics of multiple interviews are often concerned with the quality of the interviews. Research findings from studies of interview protocols recommend that interviewers use less suggestive techniques such as open-ended questions that allow for free narration from the children (Orbach et al., 2000; Sternberg, Lamb, Davies, & Westcott, 2001). Extended forensic interviews focus on building a rapport with the children and creating a friendly environment to allow children to feel comfortable about disclosing their abuse (Patterson & Pipe, 2009). Research shows the use of less suggestive techniques in extended forensic interviewing

actually may help children with their memory because it allows them to rehearse information while becoming resistant to false information (Cassel & Bjorklund, 1995). Best practices for repeated and extended interviews have been recommended (see Cederborg & La Rooy, 2008; Faller, Grabaerk, Nelson-Gardell, & Williams, 2011).

Conducting multiple interviews has intuitive appeal by giving children another chance, but they may also provide another opportunity for leading questions and other suggestive and less reliable techniques. Multiple interviews may increase false positive evaluations and unfounded allegations (Bruck & Ceci, 1999) especially when suggestive interviewing techniques are used (Goodman & Melinder, 2007). Interviewers also may disagree as to what constitutes a “clear statement.” Different interviewers may push for additional details, while others will stop questioning after they feel they have “enough” to make charges. Even more problematic, no matter how clear a child’s statements are, it is often impossible to ever know for certain whether a disclosure is “full” or a refutation or denial is true (London, Bruck, Wright, & Ceci, 2008). Thus, it is often left up to the interviewer to decide if additional interviews are necessary and this can vary by interviewer.

Research has explored the information obtained from additional interviews. A study by National Children’s Advocacy Center (NCAC) comparing children in 4-session and 8-session forensic interviewing conditions found that 56% of children disclosed by session 8 while only 29% disclosed by session 4 (Carnes, Wilson, & Nelson-Gardell, 1999). However, an examination of disclosure in the context of medical examinations reported a disclosure rate of over 40% for a single interview (DiPietro, Runyan, Fredrickson 1998). Follow-up interviews could also elicit more information (see La Rooy, Katz, Malloy, and Lamb, 2010 for a review of the benefits of repeated interviewing). Hershkowitz and Terner (2007) found that when all children underwent two interviews, the second interviews only contained 37% of the same information as the first interview. Additional information obtained from multiple forensic interviews may increase successful prosecutions and may protect other children from victimization. It is also possible that new information that contradicts previous statements could further complicate the case. This would depend, in part, on the forensic relevance and quality of the new information obtained.

Thus, it is not entirely clear whether/how multiple interviews will improve matters. Additional information obtained may result in both increased false positives and false negatives. In the legal context, a false positive occurs when the abuse did not occur in reality, but a court decides that it had occurred. In CSA cases, this would describe a child, who has not been abused but makes a false report. If authorities believe such false allegations they can potentially result in the conviction of innocent defendants; a serious travesty of justice. A false negative occurs when the abuse did occur in reality, but a court fails to find that it had occurred. So for example a child who has actually been sexually abused fails to report the abuse (often for the reasons discussed above). In such instances, actual abuse is not uncovered, the victim may not receive appropriate services, and the perpetrator may never face justice and potentially go on to victimize other children. Researchers acknowledge the importance of understanding the implication of a false positive or a false negative in criminal cases involving child sexual abuse disclosure (Ceci, & Friedman, 2000). Although both types of errors can have long-term detrimental outcomes, false positives are viewed as much worse in the legal system (Ceci, & Friedman, 2000). A basic premise of our legal system is that we would rather a guilty defendant remain free than wrongfully convict an innocent defendant (Blackstone, 1892). Though, we would argue that it might be equally important to protect both innocent defendants and potential future victims.

Though it is clear that false allegations occur, unfortunately, we are unable to estimate the prevalence of false reports. Only a handful of studies have examined the extent to which children's disclosures were deemed to be false allegations. Jones and McGraw (1987) examined 576 complaints of CSA to the Denver Department of Social Services in 1983 and estimated that nearly 2% of the cases were due to false allegations. Faller (1988, as cited in Everson & Boat, 1989, p. 231) examined 142 cases of alleged CSA and similarly judged about 3% of the cases to be untrue. In both studies children and adolescents motivated by revenge or who were psychiatrically disturbed made the majority of false allegations. In some cases, allegations were made so that the adolescent could avoid punishment. It is possible that certain sub-populations of CSA disclosures might be more likely to be false allegations (e.g., adolescents who are acting out) (Everson & Boat, 1989). Everson and Boat (1989) examined child protective service workers estimates of false reports and calculated an estimated false allegation rate of 4.7 – 7.6%. Thus research overall estimates 2–8% of allegations being false. Note that these estimates are based on the social worker(s) or evaluator(s) determination of the validity of such reports and truth remains elusive. Clinical judgment is also subject to biases; some professionals are predisposed against believing disclosures of abuse and thus might be overly likely to interpret inconsistent reports as false allegations while others may be overly likely to hold onto a decision that maltreatment has occurred despite the child trying to clarify his or her history (Everson & Boat, 1989). In the research described above, the child's allegation was deemed to be false and no further legal action was taken. There are no data that estimate how often child welfare and criminal justice professionals believe, prosecute, and convict based on false reports by children. Because of the lack of data available we are unable to estimate potential false reports as part of analyses in the current study.

We note however, that false negatives (failures to disclose actual abuse) appear to be a much larger issue. Retrospective reports consistently indicate that at least 20% of American women experienced sexual abuse as children (Finkelhor, 1994). Though we do not know that retrospective reports are accurate, other research has followed adults who had substantiated histories of child abuse. These data indicate that adult retrospective reports may still underestimate CSA (Widom & Morris, 1997; Williams, 1994). Research has also examined the extent to which CSA is reported by adults in the family. In a population-based anonymous survey of parents (Theodore, et al., 2006) it was reported that 10.5 per thousand cases of children were sexually abused. This estimate was more than 15 times higher than the official state level statistics. Thus, consistent with the adult retrospective report data, the incidence of CSA is likely unreported.

The potential gains of multiple interviews need to be balanced against the potential harms, inconvenience, and economic costs associated with additional interviews. Some experts believe multiple interviewing is likely too costly to implement in all investigations (Faller, Cordisco-Steele, & Nelson-Gardell, 2010). The use of multiple interviews assumes that sufficient resources are available for CSA investigations (Faller, et al., 2010). Like most public, child-serving systems, the child welfare system struggles to make existing resources cover child needs. One solution might be to implement multiple interviewing for only a subset of children. Doing so would reduce costs and the added interviews may yield more valuable information for some children than for others. Unfortunately, no published studies provide data on interview yield for specific sub-populations of children.

We used the extant literature to address our question regarding the benefit of conducting multiple interviews for children referred for medical evaluation for CSA. In reality, it may not be practical or plausible for some children to be interviewed more than once. The cost-analysis portion conservatively assumes that all children get multiple interviews.

We examined the benefit of a policy of multiple interviews within a specific context: a child brought for a medical examination following an allegation of abuse. The child is interviewed in the context of obtaining a medical history. In some specialized facilities, this history is obtained, in part, in a second interview conducted by a trained social worker or forensic interviewer in a multi-disciplinary evaluation. The team then determines whether the child needs to be referred for further diagnostic or treatment services (e.g., counseling, extended forensic interviewing). In practice, decisions to prosecute are frequently made with a great deal of emphasis on the child's disclosure as less than 5% of cases of CSA have physical findings (Heger, Ticson, Velasquez, & Bernier, 2002). Details from a child's disclosure can either assist or harm an investigation. This paper examines the benefits of a policy of referring all children for multiple interviews as a routine part of CSA evaluations to estimate the probability that multiple interviews will increase criminal convictions and better protect children.

## Methods

We employed decision analysis to examine the costs and benefits of a policy of multiple interviews. Costs include the additional resources required to conduct multiple interviews as well as additional law enforcement resources required to prosecute and incarcerate offenders identified. A key principle of economic analysis is to include the full effect of an intervention or policy on society's allocation of resources regardless of whether these effects are immediate, intentional or realized by the party that initiated the policy (or involve spillovers onto other government agencies). The benefits of conducting multiple interviews include the prevention of child sex abuse resulting from the identification, conviction and incarceration of offenders.

We prepared a decision tree reflecting the path of a possibly abused child through the health care, child welfare, and legal systems. This framework allowed us to examine the impact of alternative interviewing policies. We used best estimates from the literature to approximate the specific percentages described below (see Table 1). We acknowledge that it is impossible to know the true accuracy of substantiation, validation, or corroboration decisions as the alleged CSA may have occurred in a setting where no one but the child and the alleged perpetrator were present. It is always possible that a false report was "substantiated" and our model cannot account for such errors although this is statistically likely to be a small percentage of cases (see discussion above). Our decision tree (Figure 1) was adapted from Cross and colleagues (2003) child maltreatment case flow model and identifies the following six key steps that can influence whether or not a case results in conviction:

**Step 1:** In the first step of our model, a case can be referred for either a single or a multiple interview. We assume that the same number of cases will be referred for an interview regardless of whether a single or multiple interview model is adopted.

**Step 2:** The second step of our model considers the likelihood of disclosure. Using London and colleagues' (2008) review of literature on how children disclose their abuse, we calculated likelihood of disclosure based on interview approach (i.e. single versus multiple). Studies of the disclosure rates of sexually abused children have indicated that rates range from 24% to 96% (as cited by London et al., 2008). However, the interview techniques employed in some studies have been questioned. Estimates drawn from studies employing more stringent sampling methods and validated abuse indicate that anywhere from 43% to 47% of children disclose sexual abuse during the first interview (Pipe, Lamb, Orbach, Sternberg, Stewart, & Esplin, 2007; Carnes et al., 2001; Stroud et al., 2000; DeVoe & Faller,

1999; Wood et al., 1996; Gries et al., 1996; Cantlon et al., 1996; Lawson & Chaffin, 1992, DiPietro & Runyan, 1998).

Studies in which children were interviewed multiple times reveal that an additional 11–13% of children disclosed during subsequent interviews (DeVoe & Faller, 1999; Gries et al., 1996; Gordon & Jaudes, 1994). Based on this review, we estimate that the disclosure rate will be 43–47% under single interview models and 54–60% under multiple review models.

**Step 3:** The third step of our model considers the likelihood of substantiation under each approach. Our estimates reflect two studies: Palusci et al. (1999) and DeVoe & Faller (1999). DeVoe & Faller (1999) report that approximately 5% of non-disclosure resulted in substantiation, while 88% of cases in which disclosure occurred were substantiated. Palusci et al. (1999) report that disclosure raises the probability of substantiation from 25% to 42%. Combining the two studies, we therefore estimated for this step that 1) 5–25% of cases in which no disclosure occurs will be substantiated, 2) 4–88% of cases in which full disclosure was made during a subsequent interview process will be substantiated.

**Step 4:** The fourth step of our model considers the likelihood that a substantiated case will be referred for prosecution. Cross and colleagues (2003) report that 40–85% of substantiated cases are referred for prosecution. Another study (Oldroyd, 1992) found a rate as high as 95%. Therefore for this step of the model we estimated that anywhere from 40–95% of substantiated cases are referred for prosecution. No evidence suggests that disclosure affects referral among substantiated cases.

**Step 5:** The fifth step considers the likelihood that a case that is referred for prosecution will be *accepted* for prosecution or charged. We rely on several studies for our estimates in this step. Cross, Whitcomb, and Devos (1995) found that 60% of such cases were accepted for prosecution. In a similar analysis, Goodman, Taub, and Jones (1992) found that 61% of referred sexual abuse cases were charged. Honomichl, Noble, and Bonnell (2002) report that 50% of referred cases are prosecuted. The Cross and colleagues meta-analysis found a median of 63% of cases being accepted for prosecution (Cross, Walsh, Simone & Jones, 2003). Based on these studies, we estimated that between 50–63% of cases referred to the prosecution are charged.

**Step 6:** The final step of our model considers the likelihood that a case that has been charged will result in conviction. The Cross et al. analysis also found that of the median of cases carried forward (85%) between 85–100% resulted in conviction (Cross et al., 2003). By multiplying the percent carried forward by the median conviction we calculated a range of 72–85% of cases that are carried forward and convicted.

## Simulation

We analyzed the impact of multiple interviews using our decision tree with the R statistical package (R Development Core Team, 2007). We populated the model using the estimates described above. We simulated the experiences of 1,000 cases 20 times, each involving a different set of possible, randomly chosen values for key parameters. In the case of wide parameter estimates taken from the literature; the plausible values were drawn from a sampling distribution based on the standard error of the parameter estimate.

The variability in the estimates across the 20 replications reflects two types of uncertainty. First, the parameter estimates are generally based on relatively small samples and so can be rather imprecisely estimated. Second, different studies report different estimates, and that difference may reflect differences across the communities where the studies were conducted.

For each value we obtained an expected cost and outcome under each of the two policies considered.

One advantage of the approach used here is that it integrates sensitivity analyses into the main analyses. As a result, both sources of uncertainty—involving sampling error as well as community-level variability—are incorporated into our “bottom line”.

## Results

Multiple interviews of all children referred for medical evaluations of sexual abuse increase the likelihood that an offender will be convicted by 6.1% in the average community. Specifically, we estimate that the percentage of offenders convicted rises from 22.8% to 28.9%. Because the key parameter inputs are estimates and because communities differ, our analyses assume variability across the 250 communities. In 100% of the communities, the conviction rate rises under multiple interviewing. The interquartile range of our estimated rates extends from 4.9 percentage points to 7.6 percentage points.

Figure 2 illustrates the community-level variability of the effect of interviewing mode. Each point on the figure represents a hypothetical community. Reflecting the above calculation, all of the points are above the 45-degree line. That line represents communities where the rate of conviction is the same under each interviewing mode.

## Discussion

As reported in the literature, sexual abuse disclosures are typically made over time and may include denials, recantation, and later restatement that abuse did in fact occur (London, Bruck, Ceci, & Shuman, 2007). When disclosures are made, multiple interviews may increase the amount of the information provided. Reminiscence is the notion that people will remember more in subsequent interviews even after disclosure is made. Long delays between repeated interviews are found to reduce the accuracy of new information yielded from children; however, short delays between interviews do not (Hershkowitz & Terner, 2007). Note that prosecution depends not only on whether a disclosure occurs but also on the quality of information provided. For example, a recent case study examined a 9-year-old's repeated account of her older sister's abduction. Six interviews were conducted and in the final interview she said the name of the abductor who was subsequently arrested, and the older sister was found. Just one bit of new information resulted in locating the missing child and in arresting and prosecuting her abductor (Orbach, Lamb, La Rooy, & Pipe, 2012).

Some forensic interviewers (Forensic Interview Training, personal communication, 2012) also argue that more information is not always better for a legal case. The line between obtaining enough information to prosecute a sex offender and questioning a child about all of the possible information about an event is a fine one. As mentioned earlier, there are different views on the content of the second interview. Some interviews use the first to establish rapport with a fearful child and to ask demographics questions only while others ask about the alleged abuse during both interviews. In this latter instance the additional questions are usually for clarification. Though a second interview with a child may improve rapport with a fearful child or clear up questions, some interviewers are hesitant to ask about the entire event again; such questions may provide inconsistencies that represent an opportunity for defense attorneys to “poke holes” in statements, or argue for contamination of the report (Forensic Interview Training, personal communication, July 19, 2012). From a memory perspective, different details might be reported at each interview. From a legal perspective, this variability can make a child witness appear less credible. Future research

should address how additional information can potentially facilitate and/or harm prosecution.

### Economic Implication

Our simulations indicate that a policy of sending all children for multiple interviews would cost an additional \$100,000 per criminal conviction. This figure represents the costs of the interview itself (other costs might include but are not limited to increased costs to law enforcement and social services for hiring, training, and supervising additional interviewers, transportation for families, and keeping cases open longer with social services if each child takes longer to evaluate). Assessing whether the strategy is a good use of society's resources requires additional information. For those convicted of abuse or neglect, conviction means incarceration, often for many years. Such incarceration is quite expensive. Data on the average sentences for individuals who are convicted of child sexual abuse is sparse, and sentences vary by, among other things, the state in which the offense occurred, the prior record of the offender, and the circumstances of the crime. In North Carolina, child sexual abuse can constitute a Class E or a Class C felony depending on the extent of the injuries the child suffers (N.C. Gen. Stat. § 14-318.4, 2011). The presumptive sentence range for an individual with no prior record who is convicted of a Class E felony is 20 to 25 months. The presumptive sentence range for an individual with no prior record who is convicted of a Class C felony is 50 to 73 months." (The North Carolina Court System, 2011). The costs per year in a federal facility exceed \$20,000 (Administrative Office of the U.S. Courts Office of Public Affairs, 2004). The resulting incarceration costs in North Carolina, therefore, could range anywhere from approximately \$33,000 to \$120,000.

Back-of-the-envelope calculations can shed some light on the benefits side of the equation. An assessment of the benefits of apprehending an offender needs to recognize that doing so prevents multiple future offenses. While accurate figures are difficult to find, one study reports that a non-familial sexual offender victimizing children molests an average of 117 youngsters (Abel, 1985). Of course, some of the offenses will have been committed prior to the apprehension, but if we postulate that apprehension reduces total offenses by 5%, then roughly six children are not subsequently victimized by the 54% of accused perpetrators who are not biologically related. (Whitcomb, et al.

What are the benefits of six fewer victimizations for victims of non-familial child sexual abuse? The impacts of child abuse are substantial, creating enormous costs for children, their families, and society at large. Corso and Lutzker (2006) estimated that the medical and reduced productivity costs alone for child maltreatment approach \$100,000 per case. Combining this figure with a reduction of six offenders implies benefits of \$600,000.

Not accounted for in our calculations are the potential costs of false convictions to society. It is possible that increased interviews (especially poor quality interviews) can increase false convictions. Wrongful conviction costs may include but are not limited to the costs to taxpayers if the exoneree receives monetary compensation for time behind bars, the cost to the exoneree (and their family) of years lost including lost wages and education, the cost of incarcerating the wrong person, and the potential cost of additional crimes committed by the real perpetrator (New England Innocence Project, personal communication, 2013). It has been estimated that the legal costs alone of overturning a false conviction are anywhere between \$100,000–\$500,000 (Centurion ministries, personal communication, March 15, 2013). Additionally, we do not account for the long-term health costs associated with child sexual abuse. Maltreated children are more likely to require mental health services (Gelles & Perlman, 2012), are disproportionately likely to experience homelessness (Herman, Susser, Struening, & Link, 1997), are more likely to engage in delinquent behavior (Siegel & Williams, 2003). Research also indicates that victims of child maltreatment make \$5,000



less annually than adults without maltreatment histories (Currie & Widom, 2010). Thus, the direct and indirect costs of both false convictions, and CSA are both significant.

## Limitations

This study relies on previous published research and so reflects the limitations of that research. Data were collected from literature, averages assigned, and variability added. Limitations of the data prevented us from extending our model to examine additional questions, such as how the returns to multiple interviews vary with a child's age or with the severity or duration of the abuse. Previous research clearly indicates that especially the child's age is an important factor in predicting disclosure and that many other factors are related both to disclosure and repeated interviewing (e.g., suggestibility) (Goodman-Brown et al., 2003; La Rooy et al., 2009).

Although multiple interviews for each child are certainly not a universal practice, we estimate the cost associated with multiple interviews for everyone so that, if anything, our findings overestimate the costs associated with interviewing. In fact, our estimates might underestimate the benefits of multiple interviews.

The advantage of multiple interviews also may depend on whether the abuse involves family members. The available data on case flow failed to distinguish between cases in which the perpetrator was intra vs. extra familial. Though threats can always be used to frighten victims from disclosing, additional fears may inhibit or delay disclosure when family members are involved. Children who are younger, who have a history of recanting, who do not speak English, and who are delayed might need more time to disclose. These same children also might be more vulnerable to the effects of repeated interviewing in terms of both suggestibility and potential emotional harm to the child. When children are repeatedly, suggestively interviewed about an event that did not occur, the child may, at first, correctly reject the non-event as unfamiliar. However, by merely thinking about this non-event, an image is created. This image may seem familiar in later interviews and the child might misattribute the original source of this image to something that he/she actually saw, rather than imagined or thought about. Source misattribution is one mechanism that explains why multiple suggestive interviews can result in memory errors. In one study participants looked at photographs of a man and a woman acting out stereotype-consistent and stereotype-inconsistent behaviors. This study shows that when participants are being presented with visual aids (photographs) they tend to make stereotype-consistent source errors, especially with longer delays between interviews (Kleider, Pezdek, Goldinger & Kirk, 2008). The tendency to make these types of source errors increases over time and can adversely affect memories of an event or person. This study did not consider the quality of the individual interviews. There is some concern over the uniformity of practice in which such interviews are conducted (Lyon, 1999). For example, the suggestibility of an interview is often determined by the types of questions that are asked and there is lack of consistency in how interviewers define "leading" and "suggestive" questions (Lyon, 1999). Future research should examine the extent to which certain populations might benefit from multiple interviews, and the consistency in which such interviews are administered.

Depending on the age of the child, the context, and quality of the interview, multiple interviews also may lead to children adding information that is false (Wood & Garven, 2000). This could increase the risk of false convictions. Adhering to best-practice interviewing protocols that are aimed at reducing suggestibility can mitigate this risk. Our models do not consider the cost of false convictions, as we are unable to assess their frequency. One of the best ways to reduce suggestibility and false convictions is through the use of appropriate interviewing procedures. Unfortunately, assessing the quality of interviews in the current study was impossible. A commonly used and well-researched

interviewing procedure is the National Institute of Child Health and Human Development (NICHD) protocol (Lamb, Orbach, Hershkowitz, Esplin & Horowitz, 2007). This protocol relies on open-ended questioning to enhance the amount of free recall from the children and decrease the amount of false testimony due to suggestive (yes/no and leading) questioning or pressure upon the children. Open-ended questions are found to yield three to five times more information than focused questions (Hershkowitz, Orbach, Lamb, Sternberg, Horowitz, 2006). Using this protocol increases the quality of the information yielded. Even though this protocol has yielded similar results when replicated in four different countries (U.S., the U.K., Israel, and Canada) it is not consistently used in all areas of the United States (Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007).

This paper focuses on the economics of the process; it does not consider other dimensions about multiple interviews. We think that the results are intriguing in that repeated interviews may well result in more convictions but the yield may be modest. Of key concern is the quality of the interviews. One possibility we acknowledge is that increased interviews will result in increased allegations. Our decision tree does not account for the potential increase in false allegations that might result in additional false convictions. Unfortunately, there are no substantive data on false allegations (or false convictions) that we could use to populate such a model. It is plausible that our estimate of additional convictions might also include an increase in false convictions. Future research is needed to examine how much multiple interviews contribute to false allegations and false convictions. Future research needs to examine the quality of interviews as certain types of questions and interview procedures are more/less suggestive, more/less accurate, and more/less likely to result in convictions of perpetrators. Additional research should also evaluate if the value of additional interviews is higher or lower if the first (and other) interviews follow specific protocols. Finally, future research should examine how different types of repeated interviews influence outcomes. Specifically, studies should more clearly specify both the quality and structure of additional interview so that it is clear what type of information (e.g., rapport vs. alleged abuse) is obtained in each session.

## Conclusions

Empirical research is needed to more carefully examine how the effect of child age and relationship to perpetrator are related to child disclosure across one vs. multiple forensic interviews and subsequent successful prosecution of guilty perpetrators. It will also be essential to better examine the type of information obtained from multiple interviews and how its potential forensic relevance impacts plea-bargaining, conviction, and ultimate incarceration of sexual predators. Future studies should focus on subsets of children who are currently identified as likely benefiting from multiple interviews such as young/preschool aged children, children with cultural and language differences, or severely traumatized children. According to number needed to treat (NNT) calculations, approximately 17 children would need to move to a condition of being interviewed on multiple occasions to result in one additional conviction for CSA (Laupacis, Sackett, & Roberts, 1988). This number may be small compared to the benefit of protecting other children from victimization.

## Acknowledgments

The first author was supported in the preparation of this article by a NIH Ruth Kirschstein T-32 National Institute of Child Health and Human Development (Grant 5-T32-HD007376: Human Development: Interdisciplinary Research Training) to the Center for Developmental Science, University of North Carolina at Chapel Hill. We would like to thank Dr. David La Rooy and several anonymous reviewers for helpful feedback on earlier drafts of this paper.

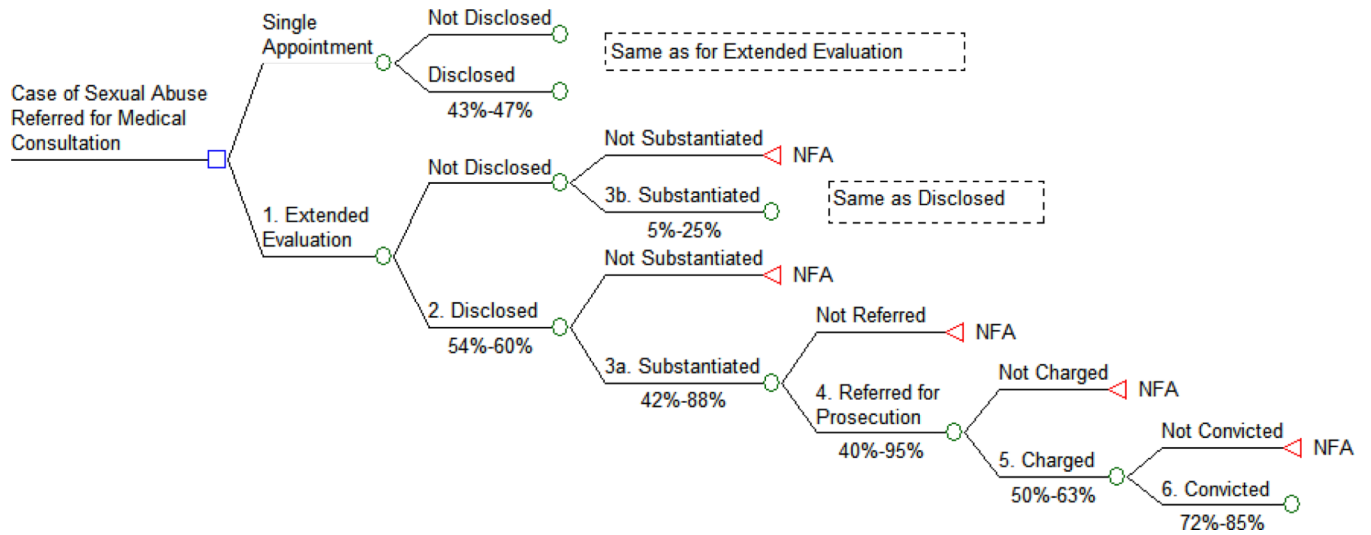
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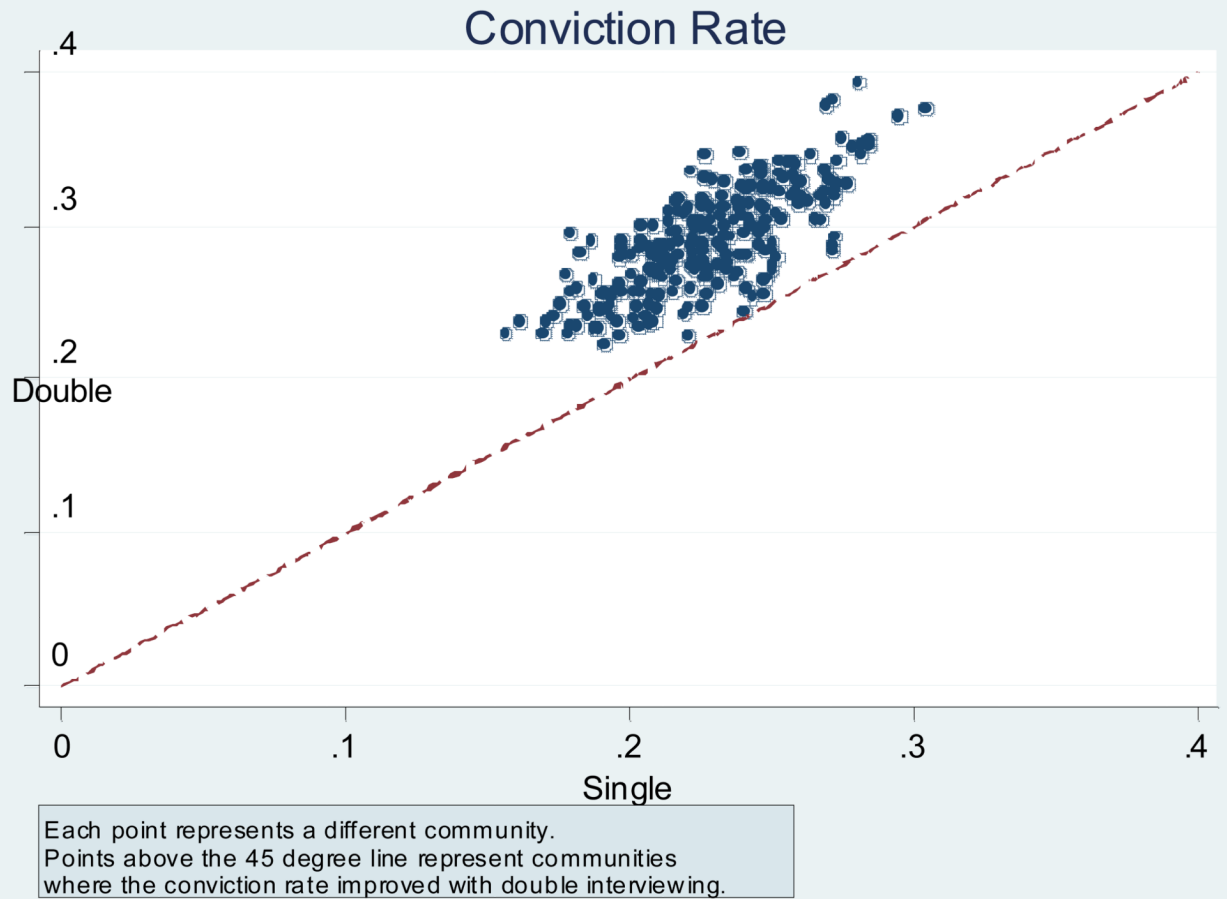
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**Figure 1.** Decision Tree for Multiple Interviews Influencing the likelihood of a Child Sexual Abuse Case Coming to Prosecution



**Figure 2.**  
Distribution of Projected Conviction Rates for Two or More Interviews of the Victim Child Compared to a Single Interview



**Table 1**

## Parameters for Decision Tree

Parameter	Estimate	Source
Probability of disclosure under single interview	43%–47%	(Pipe et al., 2007; Carnes et al., 2001; Stroud et al., 2000; DeVoe & Faller, 1999; Wood et al., 1996; Gries et al., 1996; Cantlon et al., 1996; Lawson & Chaffin, 1992, DiPietro & Runyan 1998)
Probability of disclosure under multiple interviews	54%–60%	(DeVoe & Faller, 1999; Gries et al., 1996; Gordon & Jaudes, 1994)
Probability of substantiation under single interview	5%–25%	(Palusci et al., 1999; DeVoe & Faller, 1999)
Probability of substantiation under multiple interviews	4%–88%	(Palusci et al., 1999; DeVoe & Faller, 1999)
Probability of referral for prosecution under single and multiple interview(s)	40%–95%	(Cross et al., 2003; Oldroyd, 1992)
Probability of case accepted for prosecution	50%–63%	(Honomichl, Noble, & Bonnell, 2002; Cross et al., 1995; Goodman, Taub, & Jones, 1992)
Probability of case accepted for prosecution and convicted	72%–85%	(Cross et al., 2003)