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Case file coding of child maltreatment: Methods, challenges, and innovations in a longitudinal project of youth in foster care[☆]

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Abstract

State social service agency case files are a common mechanism for obtaining information about a child's maltreatment history, yet these documents are often challenging for researchers to access, and then to process in a manner consistent with the requirements of social science research designs. Specifically, accessing and navigating case files is an extensive undertaking, and a task that many researchers have had to maneuver with little guidance. Even after the files are in hand and the research questions and relevant variables have been clarified, case file information about a child's maltreatment exposure can be idiosyncratic, vague, inconsistent, and incomplete, making coding such information into useful variables for statistical analyses difficult. The Modified Maltreatment Classification System (MMCS) is a popular tool used to guide the process, and though comprehensive, this coding system cannot cover all idiosyncrasies found in case files. It is not clear from the literature how researchers implement this system while accounting for issues outside of the purview of the MMCS or that arise during MMCS use. Finally, a large yet reliable file coding team is essential to the process, however, the literature lacks training guidelines and methods for establishing reliability between coders. In an effort to move the field toward a common approach, the purpose of the present discussion is to detail the process used by one large-scale study of child maltreatment, the Studying Pathways to Adjustment and Resilience in Kids (SPARK) project, a longitudinal study of resilience in youth in foster care. The article addresses each phase of case file coding, from accessing case files, to identifying how to measure constructs of interest, to dealing with exceptions to the coding system, to coding variables reliably, to training large teams of coders and monitoring for fidelity. Implications for a comprehensive and efficient approach to case file coding are discussed.

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1. Introduction

Research suggests that over half a million youth are exposed to child maltreatment, many of whom display significant mental and physical health problems over the course of their lives (U.S. Department of Health and Human Services, 2014). Research focused on understanding the impact of maltreatment and developing effective interventions to prevent and ameliorate negative consequences associated with traumatic stress is critical to the wellbeing of many youth. For these research endeavors and subsequent prevention/intervention efforts to be successful, the degree and nature of each youth's maltreatment exposure must be understood to replicate scientific findings and make well-informed recommendations for the field. For instance, if the specifics of a youth's maltreatment history remain largely unknown, researchers are unable to link variables such as severity and chronicity to pertinent outcomes, preventing clear explanations for why some youth develop problems while others exhibit better functioning. Service providers are then unable to direct youth to the appropriate services given their exposure history and risk for poor consequences. At face value, measuring maltreatment appears to be a rather simple practice – either an event or experience happened or it did not. However, despite the numerous strategies for measuring maltreatment and the large body of research that variably utilizes said strategies, a deeper look into the process of maltreatment measurement quickly illustrates the difficulties associated with sorting out this complex construct.

One way researchers determine the presence and extent of maltreatment is to review the state social service agency's case files, usually a set of records composed of narrative descriptions and legal conclusions about the nature of the child's experiences (Feiring & Zielinski, 2011). Case files are viewed as a good source of information given that they contain reports of alleged maltreatment made to Child Protective Services (CPS) through hotline calls (i.e., phone calls) from mandated reporters as well as others who interacted with the children and families in question (DePanfilis, 2006). Further, these files include the conclusions of these hotline calls, specifying whether a given report was investigated and if the allegation was ultimately substantiated. Previous research has supported the use of case file data and demonstrated the level of rigor that can be achieved in studies that utilize such records (Brownell & Jutte, 2013; Green et al., 2015). One argument that has been made is that case file records are not subject to the social desirability bias likely to be present in self-report of parenting behaviors (MacMillan, Jamieson, & Walsh, 2003), nor are they affected by forgetting, misremembering, or failure to disclose, all of which may be present in child self-report (Greenhoot, 2011). Case files, which are able to provide externally validated information across a number of years, contribute to rich longitudinal datasets from which researchers can explore different facets of maltreatment as well as relevant predictors and outcomes.

Although numerous studies have used case file reports to measure maltreatment exposure (Fisher, Burraston, & Pears, 2005; Mennen, Kim, Sang, & Trickett, 2010; Merrick, Litrownik, Everson, & Cox, 2008; Taussig, Culhane, Garrido, Knudston, & Petrenko, 2013), and many have used comprehensive coding systems (e.g., Modified Maltreatment Classification System [MMCS; English & the LONGSCAN Investigators, 1997]), lack of information on *how* researchers code case file data, particularly when such data falls outside the scope of the coding system, prevents the field from comparing and interpreting results (Green et al., 2015). For example, a parent hitting a child would be coded as physical abuse within every coding system, but some coding systems do not clarify whether hitting a child in the arm multiple times should be coded as one instance of physical abuse or multiple. Further, it is unclear whether hitting a child on his or her arm, back, and leg within the same time frame should count as three separate events or one event. In part, the answer to this question lies with a researcher's study goals and what the researcher is interested in analyzing; perhaps frequency or severity is not of interest at all. However, it would be helpful to know methods of measurement to understand how the field is measuring maltreatment so that findings can be compared and replicated.

Further compounding this issue is the limited space devoted to the coding process in a typical journal article. Without knowing how a given project coded the vast, and at times, incomplete, material available in a child's case file, replication of research using the same maltreatment coding metrics is almost impossible. Further, although research teams may purchase training and consultation through highly experienced groups such as the Consortium of Longitudinal Studies of Child Abuse and Neglect (LONGSCAN), this is not a realistic option for all projects. A unification of coding approaches can be facilitated through freely accessible and shared accounts of how various research teams have handled common coding difficulties. Thus, the purpose of the present discussion is to provide an example of the file coding process used by the research team of a longitudinal study of resilience in maltreated youth in foster care (Studying Pathways to Resilience and Adjustment in Kids [SPARK]), beginning with accessing the case files to solving coding problems. The description provided herein, of the procedures and methodological changes throughout the complex process of developing a standard way of coding inherently complicated data, is meant to provide recommendations for other researchers planning to utilize case file data in their future research endeavors, and to begin a conversation amongst researchers involved in coding maltreatment about best practices for case file coding.

2. The SPARK project

The SPARK project is a federally funded research initiative examining risk and protective processes related to emotional/behavioral, academic, and physical health outcomes in youth who reside in foster home settings or residential facilities. Data were collected over the course of five years, resulting in 518 participating youth at time point 1, and 302 participating youth across all 3 time points. To be included in the study youth had to be 1) eight years old or older, 2) in state custody for at least 30 days, and 3) have no developmental delay diagnoses (i.e., autism spectrum disorder, intellectual disability).

The state-authorized foster care administration and district county circuit court were the legal guardians of all youth in the study and these officials provided consent for youth participation. Consent was also obtained from foster caregivers and assent from each of the youth. For more information on how SPARK participants were recruited and enrolled, see Jackson, Gabrielli, Tunno, & Hambrick, (2012). The SPARK project collected both youth self-report and case file reports of maltreatment to provide a robust assessment of maltreatment experiences amongst the youth in the sample. Case files for each youth in the study were provided by the state social service agency. Below, the process used to both obtain and navigate the files and then of measuring information contained within the files is described. A thorough description of the procedures and methodological adaptations needed to capture the nuances of case file coding will provide the field with lessons learned and techniques adopted following those lessons learned. Table 1 summarizes the key challenges and recommendations for coding case files discussed below.

2.1. File coding process

2.1.1. Accessing case files—Coding case files to ascertain the degree and nature of maltreatment is only possible after successful acquisition of those files. This step is clearly essential to the process, yet can prove more convoluted than expected. What follows is a brief description of the major steps taken and lessons learned, as a more in-depth review of this process is available through Green et al. (2015).

Given the highly sensitive nature of the information included in case files of children in state custody, establishing a trusting relationship between the researchers and state child protective services personnel was necessary. First, several meetings with knowledgeable stakeholders from the state occurred to ensure that accessing information (i.e., the case file of the child in custody) was feasible. Next, releases for each child (signed by CPS administrative staff) were obtained to ensure security and authorization of the case files. Then, procedures for data-sharing were established. Identifying and contacting an appropriate person(s) to facilitate data-sharing was critical to the successful obtainment of hundreds of case files.

The SPARK team hired a retired state agency worker (e.g., the CPS liaison) who helped the team access new files as youth were recruited into the study. The information in the files was left essentially intact except for any reference to the name of the caller to the hotline and any person's social security number, which was redacted by the CPS liaison. When conducting research within state agencies, it is particularly important to recognize the already large workload expected of CPS caseworkers (Jackson et al., 2012). Maintaining a CPS liaison, paid by the SPARK team, helped ensure that case managers did not have to take time from their already overloaded schedules to obtain and redact case files.

2.1.2. Navigating the files—The research questions for the SPARK project required that several variables about the child's history of maltreatment be coded. It was determined that the following variables were important and could likely be reliably coded from the set of case files we received: date of mandated report, date of alleged maltreatment event, type/severity of alleged maltreatment event (with corresponding MMCS code), type of decision

after call was placed (e.g., assessment, investigation, preventative services), conclusion of investigated cases (i.e., substantiated vs. unsubstantiated), services recommended for assessment cases, age of the participant when event occurred, frequency of alleged event, and the relation of the alleged perpetrator to the child participant. In addition, the SPARK team identified information related to general family risk factors for maltreatment (e.g., parental substance abuse). Consultation with CPS stakeholders, researchers well-versed in using the MMCS, and frequent meetings of the SPARK team were necessary during the process of identifying key variables, and these collaborations continued throughout coding of the case files to ensure validity of methods.

Once collaborative relationships were established, several other meetings were held to ensure that graduate research assistants and the principal investigator (PI) understood the layout and language used throughout the case file. Given that the SPARK project file coding research team was not trained in the CPS computer systems used to document alleged maltreatment events and the conclusions of these events, the SPARK team maintained ongoing collaboration with the CPS liaison, who had years of experience navigating the state agency system.

This CPS liaison provided indispensable support and knowledge regarding the organization of the case file and where to find important information. For instance, this individual taught the team where in the file to find the assignment of the case (e.g., assessment, investigation) following the hotline call and the conclusion of investigated cases (i.e. substantiated vs. unsubstantiated), as well as to understand what this language meant. This liaison also kept the team apprised of changes made in CPS documentation.

Files were often hundreds of pages long, and although they were obtained from the same agency, their formatting and content were often inconsistent. Even in the absence of inconsistencies, it was difficult for researchers to understand how to interpret the CPS maltreatment reporting system. For example, sometimes state workers were forced to categorically choose only one type of maltreatment from a drop-down menu, and often, selections the case workers made did not appear to capture the event they described in narrative form. The SPARK team coded the narrative, or the case worker's detailed description of the hot-line call, rather than recording the maltreatment type that the CPS worker selected from the drop-down menu within the computer-based reporting system. The narratives provided a more specific account of the child's experiences, and allowed coders to capture the multiple types of maltreatment that were reported. For example, if the reporter indicated that a child was shoved and locked in his bedroom for two days by his father, the state agency worker might indicate that this call was primarily physical abuse. The SPARK team, however, coded this as both physical and emotional abuse.

In addition, it was decided that both substantiated and unsubstantiated instances of maltreatment would be coded. The reasons for inclusion of unsubstantiated cases were twofold. First, evidence suggests that the difference between a CPS report receiving a disposition of substantiated or unsubstantiated is accounted for by variability within the CPS system, and is not always an accurate portrayal of whether or not maltreatment occurred (English, Marshall, Coghlan, Brummel, & Orme, 2002; Leiter, Myers, & Zingraff, 1994).

Substantiation can depend on the state requirement for evidence and the CPS investigator's sense of perceived harm of the alleged maltreatment (Cross & Casanueva, 2008), a subjective metric.

Second, some types of child maltreatment (e.g., physical abuse) are easier to substantiate than others (e.g., emotional abuse, sexual abuse; Glaser, 2002; Jones, Finkelhor, & Kopiec, 2001). Thus, not coding unsubstantiated reports could have resulted in an incomplete picture of what the child experienced, and coding these events allowed for the SPARK team to empirically determine in subsequent analyses what events did and did not have an influence on the child's overall adjustment. In regard to navigating case files, it is recommended that collaboration with CPS liaisons and subsequent thorough comprehension of the information included in the case file is necessary. Moreover, "codes" derived by CPS workers should not be used without confirmation that they indeed represent the construct of interest to the researchers, and information from unsubstantiated reports should also be coded.

2.2. File coding measurement issues

2.2.1. Coding the files—Maltreatment information from each case file was coded using the MMCS. The MMCS is a coding system created to classify and categorize the information found in the hotline calls within case file reports (English et al., 2002). It was created as a modification of the Maltreatment Classification System (MCS; Barnett, Manly, & Cicchetti, 1993), which was developed to help promote definitional clarity regarding research definitions of child maltreatment (Manly, 2005). The MMCS added greater specificity to intermediate severity codes, dropped the original chronicity codes, and disaggregated a variety of neglect codes combined in the MCS (Runyan et al., 2005). To use the MMCS, the coder first determines the maltreatment type for an event or episode specified in the case file report. The broad categories of maltreatment in the MMCS are physical abuse, sexual abuse, physical neglect (failure to provide food, shelter, clothing, hygiene, or medical care), supervisory neglect (general lack of supervision, inappropriate substitute care, or lack of supervision in a dangerous environment), emotional/psychological maltreatment, moral-legal/educational maltreatment, and drug/alcohol use. After identifying an abuse type, the coder then chooses a code based on the severity of the maltreatment. For example, if a hotline call revealed that a child was forced to watch pornography, the coder would select sexual abuse as abuse type and then assign the specific severity code associated with exposure to pornography. The MMCS is highly popular amongst maltreatment researchers, having been cited in over 75 empirical articles and used by several research groups other than LONGSCAN (e.g., Mennen et al., 2010; Stahmer et al., 2009).

This type of system helps researchers convert qualitative reports of maltreatment into a quantitative format in a comprehensive and reliable manner. Although the MMCS may be the most widely-used and detailed coding system, there is a range of what might be considered abusive in a case file, and descriptions of maltreatment within files are often nuanced, vague, or unique, and do not always clearly align with the severity categories described in the MMCS (e.g., a father allowed a young child to get a tattoo, but the tattoo had to be the father's name). Given that some descriptions of abusive or potentially abusive behavior can be vague, researchers likely manage the information in the case file in

idiosyncratic ways, which makes it difficult for others to emulate coding procedures and creates challenges in comparing results across studies. While the MMCS provided a well-organized and comprehensive system of coding case files, the current researchers encountered numerous instances in which it was unclear how to apply the MMCS, thus meriting a discussion on what to do about those instances. No supplement or additional guide to using the MMCS is currently available, thus our specific resolutions (i.e., File Coding Rules [FCR]) were included in Table 2, with hopes that this resource will improve consistency across studies.

2.2.2. Big picture issues in file coding—Interestingly, of all the aspects of child maltreatment, the type of maltreatment can often be the most difficult to code consistently. Although the MMCS provides guidelines and operational definitions for broad categories of maltreatment like physical or sexual abuse, not all events are straightforward or consistent with these categories. For example, if the narrative stated that a child smoked marijuana that he found in the home, potentially suitable codes include moral-legal maltreatment and drug/alcohol use. It is not always clear which maltreatment type best fits a particular incident. It is important to note that events are very specific pieces of information, and there can be multiple events within one maltreatment incident. For instance, if a child suffered rope burns from being tied up and left in a room for days, a person might see that as one event, but the SPARK team would classify it as two, and would have just one code for each of those events (being tied up and left in a room is emotional abuse, while rope burns are physical abuse).

In the previously mentioned example, if the narrative in the hotline call stated that the participant's mother provided her with marijuana, this would be coded as moral-legal maltreatment due to the provision of drugs by a parent. If the narrative stated that the participant found marijuana in the bathroom drawer and smoked it, this would be coded as drug/alcohol use because the parent did not actively provide the drugs to the child, but did have them available in the home. Finally, if the narrative stated that the participant's mother provided her with marijuana and that there is marijuana in an accessible place in the home, both the moral-legal maltreatment and drug/alcohol use codes should be used, to capture both events.

When faced with difficulties determining which type of maltreatment a given event should be coded, the SPARK team took the following steps: 1) consultation with fellow coders on the coding dilemma, 2) collaboration and consultation with CPS liaison (if needed), 3) finding consensus amongst three coders or a coder and the PI regarding the code that best encompasses the maltreatment type, and 4) documenting the rationale regarding the code chosen for reference on future dilemmas. The coders and the PI were in the best position to solve these dilemmas given that the decision made needs to fit with the research question of the project.

Another challenge encountered in case file coding is selecting the correct severity level for a particular type of maltreatment. Severity level is determined not only by the quality of a maltreatment event (e.g., dirty house vs. house that has been condemned due to being unsafe and unsanitary), but by time period. For instance, according to the MMCS, general lack of supervision is coded as mild if the child is left alone for less than 3 h, and severe if the child

is left alone overnight. Similarly, educational maltreatment is coded as mild if the child misses less than 15% of the reported period, and moderate to severe if the child misses 26% to 50% of the reported period, as specified by the MMCS. One difficulty when utilizing the MMCS was that case files were often incomplete and did not specify time periods at all or provide evidence as to what the likely time period might be, in which case the coders assigned the least severe code to be conservative regarding the severity of the alleged maltreatment event, as taking a conservative approach is in line with the methods of expert MMCS coders.

Similar issues were encountered in coding frequency of abuse or neglect. The SPARK team encountered many narratives in which the child stated that some event, such as being hit by a parent, happened to them every day, weekly, monthly, many times, or over years. Narratives often contained maltreatment events that reportedly happened a few times, several times, or more than twice. For example, a child was hit on his leg with a belt and choked. He also stated that his grandmother hit him “all the time”. This was coded as three instances of physical abuse to be conservative regarding the frequency of the abuse. Another child reported that his father had slapped him last week, Monday, and that morning, and that his father had kicked him two or three times. This was coded as three instances of physical abuse to account for the slapping, and two instances of physical abuse to account for the kicking, again to be conservative.

Another frequency-related issue is when a similar or potentially the same maltreatment event is found within two different hotline calls in one case file. For example, one hotline call stated that the participant was sexually abused by an uncle, and then the next hotline call also stated that the participant was sexually abused by an uncle. If it was reasonably clear that the event only happened once but was reported in two separate hotline calls, because the date and specific details were included in the narrative, then the event was only coded once. As a side note, this also speaks to the use of ordering all of the hotline calls from earliest date to most recent date, so that the coder can code an event the first time it is reported. If it was not entirely clear whether a similar-sounding event was the same or different, the team coded it as another event, so as not to make assumptions about what happened in the narrative.

Other challenges to consistent file coding are related less to the case file documents and more to coder behavior. For example, on the SPARK team, file coders learned to remain as objective as possible and limit assumptions when there was incomplete information regarding the alleged maltreatment event. The SPARK team created the “File Coding Rules” (FCR) that worked as a list of coding rules for unclear information (see Table 2). The FCR promoted greater reliability amongst coders by ensuring that each coder knew how to code ambiguous events such as “the child was slapped many times.” This document was saved in a shared spreadsheet that allowed for team-wide access, updating, and posting questions when information in the case file was unclear. Hard copies were also available in the file coding office.

Beyond maltreatment type, severity, and frequency, the team addressed other issues that traversed categories of the MMCS yet were not included in the coding system. One rule—to

balance coding all important information while simultaneously taking a conservative approach in which coders avoid making assumptions—helped guide decisions when coders were unsure whether or not to include an event. Because files were coded and entered into the database in separate steps, any over-coding of events could be checked and corrected before the data was included in subsequent analyses. However, coders were also trained to be vigilant for any biases in interpretation of narrative information by only utilizing what was exactly stated within the text of said narrative.

Another rule was that only events that happened to a SPARK participant or another child living with the participant were coded (e.g., maltreatment of a child at school or in the neighborhood was included in the narrative but not coded). We found reading the narrative to carefully identify the alleged victim of each event to be important. The CPS liaison helped the team navigate the file when narratives were unclear about who was abused (e.g., one of the kids was hit) because this information was sometimes located in a different section of the file outside of the narrative. In cases where it was impossible to identify the alleged victim, the event was still coded, and the coder checked “unknown” in response to the “involved study participant” question on the file coding form. Furthermore, as narratives sometimes contained instances of alleged maltreatment that happened to another child in the family, and the SPARK team endeavored to include all possible forms of the child’s maltreatment environment to capture the overall load of adversity a child may have experienced, we tried to use the entirety of the case files to fully capture this phenomenon. This point was discussed thoroughly amongst the team and with CPS collaborators. Third, the team decided to add a Not Otherwise Specified (NOS) category to each type of maltreatment in the MMCS codebook, in addition to the preexisting NOS category for physical abuse, for instances when an event was clearly maltreatment, but did not fit into one of the specified severity levels (e.g., when a parent demonstrated a pattern of preferential treatment toward one child over another, this was coded as Emotional Abuse NOS). NOS codes were used sparingly, and made up less than 10% of all codes, yet were deemed necessary to protect the validity of the other codes.

2.2.3. Specific issues in file coding—The previous rules provided a general guide for the SPARK team, but some of the most important decisions about coding were nuanced and detailed. What follows is a discussion of how the SPARK team managed difficult decisions, as similar issues are likely common and may come up for other researchers coding case files reports.

In the physical abuse category, it was decided that every physical assault on a child should be coded, but not every mark or injury was coded separately. If the narrative from the hotline call stated that a child had a bruise and a scratch on his right arm and there was not specific information about how those injuries occurred, this was coded as one event as it is conceivable that both marks could have resulted from a single perpetrator action. However, if the narrative stated that the parent punched the child in his arm, giving him a bruise, and then the parent scratched him trying to grab his arm, these were coded as two events, as they are two separate actions by the alleged perpetrator in the case file.

The emotional/psychological maltreatment category, perhaps the most diffuse maltreatment classification, necessitated the creation of multiple rules. Often, a narrative stated that the parent or caretaker screamed, yelled, or cussed at the child. Because one incident of yelling or cussing does not meet MMCS criteria for a code, we coded only multiple events or ongoing yelling and cussing as a pattern of hostility directed toward the child (MMCS code 500-37). In the emotional/psychological maltreatment category, most challenges for coding consistently are for instances of domestic violence between adult figures in the home. The MMCS has a code for domestic violence when one or both parties' lives are threatened, but it is unclear whether there is a code designed to encompass verbal domestic violence. The SPARK team decided that if verbal domestic violence was not coded in some form, the complete maltreatment experience of the child (albeit perhaps indirect experience) would not be captured. Therefore it was decided that no matter the specifics of the domestic incident, the event would be coded as emotional maltreatment (MMCS code 500-42) if the child witnessed the event. This coding approach is consistent with that of an MCS expert (Barnett et al., 1993).

Coding of substance use and abuse in the home was also clarified by the SPARK team. The drug/alcohol use code in the MMCS requires that the use of illicit drugs or alcohol has "a negative effect on the well-being, caretaking, or safety of the child" (pp. 33). The team decided to assign this code whenever the narrative stated that the caregiver suffered from alcoholism or a drug addiction. If the narrative stated that drugs or drug paraphernalia were in the home but did not specifically state that the children had access or that drug use/drugs in the home affected the child's safety/wellbeing, then it was not codeable. In some cases, a second code was necessary to accompany a drug/alcohol use code. For instance, if the narrative mentioned giving drugs to a child or allowing a child to participate in the drug/alcohol activities, a moral-legal maltreatment code was added.

For issues of neglect - failure to provide food, a parent selling food stamps to buy alcohol or drugs was not coded unless the narrative explicitly stated that this had some effect on the child's well-being (e.g. the child had gone without meals as a result). However, this could be captured as the risk factor "insufficient use of funds". Although some narratives state that a child was hungry or did not have food, the SPARK team only coded neglect - failure to provide food when there was an indication that the child had gone some identified period of time without eating or was significantly affected by a lack of food (e.g., signs of malnutrition). This allowed coders to assign a severity level in line with the MMCS guidelines, which differentiates severity by the number of meals missed or the length of time without a meal. Although this method is not flawless, it does help to differentiate between failure to provide and poverty, a critical distinction in the field.

The neglect - failure to provide medical care category in the MMCS does not give examples of psychiatric issues within each severity level. Specifically, not attending to a mild behavior problem is categorized in the MMCS as mild (level 1), but there is no example of which severity level accompanies a more severe behavioral or emotional problem, such as bipolar disorder. Thus, the SPARK team coded a major psychiatric problem as moderate to severe, or a level 3, which is consistent with recommendations from an MCS/MMCS expert. A caregiver not seeking treatment for suicidal ideation was coded at the next-highest severity

level (level 4). If the caregiver did not seek help for a life-threatening emotional problem (e.g., suicidal or homicidal attempt), the event was coded at the highest severity level (level 5, which is included as an example in the MMCS).

The examples described above illustrate the exceptions to the largely comprehensive MMCS. Although the MMCS provides an inclusive classification system for maltreatment exposure, allowing researchers to code maltreatment in a more uniform way, it is not exhaustive. The current discussion clarifies how the SPARK team managed coding issues not addressed by the MMCS so that other research projects may code in a similar way, or at least be alerted to differential methods that may impact findings. We recommend that coders encompass the complete picture of maltreatment within each narrative with their codes (e.g., do not leave out any maltreatment events) while still taking a conservative approach that is most reflective of the alleged incident of maltreatment. In other words, to code conservatively, only code separate instances of maltreatment if they are clearly delineated within the narrative. If narrative information is vague or unclear, find a category in the MMCS that fits the information as much as possible. The goal is to code what is present in the file without making assumptions, while still being reflective of the child's actual experience. Addressing these issues reduced discrepancies amongst coders and led to good reliability, and the rules developed by the SPARK research team potentially provides a model for other research projects.

2.3. File coding training

The importance of reliability in coding qualitative data is paramount. Researchers have taken a variety of approaches to determining reliability in case file coding. For instance, the LONGSCAN research team reported that coders across sites were trained to 90% agreement (Merrick et al., 2008), and overall agreement on the coding for maltreatment type was good (all kappas > 0.7). Other studies generalized their reliability procedures by reporting that some percentage of cases were double coded, that inter-rater reliability was conducted, and/or disagreements were resolved by consensus scoring (Fisher et al., 2005). The goal of this section is to detail the approaches used by the SPARK project to ensure accurate and reliable coding of case file data.

New team members first received didactic training in the MMCS, navigating case files, the goals and nature of the SPARK project, and our Wave 1/Wave 2 coding process (described below). Training materials included the MMCS coding scheme, the FCR document (once it was developed), actual case files, and the coding form. Next, trainees began reliability coding. Initially, coders in training were paired so that each coded the same case file independently and a third person, the reliability coordinator (i.e., person in charge of calculating reliability), reviewed agreement between the pair of trainees. Trainees coded at least 10 files in this fashion. The reliability expert then calculated reliability statistics for each file and an overall reliability estimate for the 10 files, and highlighted areas of disagreement for the trainees to review together.

As training progressed, a team of experienced coders with demonstrated reliability in case file coding developed. At that point, new team members received didactic instruction as described above, and then shadowed experienced coders to observe the process. Trainees

were then assigned 10 files already coded by an experienced team member, and the new coder's reliability was calculated against the experienced coder's. This has been an improvement on previous approaches in training, as experienced coders can act as guides for trainees. In addition, pairing experienced coders with trainees helped to combat coder drift because it forced experienced coders to remain up-to-date with coding procedures so that they could accurately correct trainees' errors. Coder drift did occasionally occur, which was typically identified through the reliability coding process when the reliability coordinator noticed that the discrepancy between the trainee and the experienced coder was due to the experienced coders' error. In these cases, the experienced coder was notified of the disagreement, and asked to reevaluate the case file to determine if changes needed to be made. Specific coding errors and overall patterns of coder drift were addressed in semi-monthly team meetings.

Standards for reliability were 10 files coded with at least 80% inter-observer reliability (IOR; Martin & Pear, 2003) or kappa of at least 0.80 (Krippendorff, 1980), depending on the nature of the variable being coded (dichotomous or count). Once reliability was reached, coders worked independently on each new case file. Trainees met with the experienced coder with whom they were paired to discuss each file, comparing their codes and discussing areas of disagreement until consensus could be reached. The reliability coordinator often joined these meetings in order to provide a final say about disagreements. Particularly puzzling issues were brought up at semi-monthly team meetings, at which all file coding team members were present, or e-mailed to the study PI. Disagreements between coders were resolved through discussion of the nuances of the situation, identification of the relevant rules in the FCR, and careful reading of the MMCS. Often, discussion of these puzzling issues prompted additions to the FCR to document decisions for future use. This process of identifying areas of disagreement and coming to consensus was crucial in the training of coders, as it allowed them the opportunity to correct mistakes and hear rationale for correct coding procedures.

The SPARK team designed a two-tiered coding system that maximized efficiency. Coding variables were divided into two tiers: Wave 1 and Wave 2. Variables were divided into Wave 1 and Wave 2 according to the level of knowledge about child maltreatment necessary to code them accurately, as well as the need to code some variables before others. Wave 1 variables were grouped because they required coders to have a strong familiarity with child maltreatment as it is defined in the literature, and in the MMCS more specifically, so that they could decide what does and what does not count as maltreatment. It was determined that individuals with insufficient prior knowledge of this topic often either coded too many or too few events due to a lack of knowledge regarding what did and did not constitute alleged maltreatment.

The goal of Wave 1 was to identify all of the unique alleged maltreatment events within each call in the file. Wave 1 coding variables included the call number (assigned by CPS), event number (numbered sequentially within each call), report date and time (i.e., when the hot-line call was made), incident date (i.e., the date of the alleged maltreatment incident), whether or not the study participant was involved in the maltreatment event, and a brief description of the type of abuse event (see Appendix in Supplementary Data for a sample

coding form). Wave 1 training was quite time-intensive, requiring around three months of didactic instruction and reliability coding. While coding, trained Wave 1 coders physically highlighted sections of the maltreatment narrative that were maltreatment events; this was done to facilitate the Wave 2 coding process. In addition to the separation of Waves 1 and 2 based on prior knowledge of child maltreatment literature needed to code the variables, they were also divided such that Wave 1 variables were coded before Wave 2 variables. This division was for two reasons. First, it had to be decided whether or not a maltreatment event occurred before details about the maltreatment event could be determined (e.g. severity level, perpetrator). Second, reliability was more easily achieved if individual coders were responsible for a prescribed set of variables. When coders were instructed to code all aspects of a maltreatment event simultaneously, they made more errors than when they became experts on a cluster of related variables.

For Wave 2 coding, a different file coder filled in the rest of the coding variables. Variables that can be more objectively determined compared to the subjectivity involved in Wave 1 were grouped under Wave 2. For instance, maltreatment event substantiation can be found within the case file and does not require coder interpretation. MMCS severity codes do require some interpretation, but a working familiarity with the coding system was achieved through a moderate amount of training (i.e. several weeks, as opposed to approximately three months for Wave 1 training). Wave 2 variables included type of call (investigation, assessment, or alpha), whether the investigation was substantiated or unsubstantiated, the perpetrator's relationship to the victim, whether or not the study participant was the perpetrator, and the MMCS code (severity of the maltreatment event). Wave 2 coders also identified risk factors indicated by the file.

This two-tiered coding system had several advantages. First, Wave 2 coders required less intensive training, which allowed individuals less experienced with research to become well-versed in the coding protocol. The coding system is thorough and clear enough that Wave 2 coders quickly filled in remaining maltreatment variables. The relative ease of Wave 2 coding tasks speaks to the robustness of the MMCS coding system. Second, each file was seen by two coders allowing for quality control of the coding packet. Wave 2 coders occasionally found additional maltreatment events not coded by Wave 1 coders. These issues were resolved through meetings between Wave 1 and 2 coders or in larger team meetings. Specifically, the reason for the discrepancy was determined (e.g., the Wave 1 coder missed the event, the Wave 1 coder did not use the FCR document to determine how to best code this event, the Wave 2 coder was mistaken and the event cannot actually be coded according to the MMCS and FCR), and then the appropriate change was made to the file coding form. Third, specialized coders consulted with one another on minor coding issues, requiring less direct contact with supervisors. Given the lengthy reliability training process, file coders were well-versed in the coding system, particularly in variables relevant to their training. It is clear that information included within the case file is complex and sometimes difficult to navigate. The SPARK file coding team developed and utilized a systematic approach to include all relevant information while maximizing efficient coding procedures.

It is recommended that researchers coding case files develop a system that works for their team to ensure efficient and reflective coding of all relevant information. It is important to

highlight and utilize individual strengths of coders within the team. For instance, more complex coding (Wave 1) was typically conducted by graduate research assistants (who have the most training and contact with CPS affiliates) while more objective coding (Wave 2) was completed by undergraduate research assistants (who have training but might lack experience regarding child maltreatment research).

3. Discussion

As the field strives to understand how youth exposed to maltreatment function and adapt, the significance of accurate measurement of maltreatment must not be underestimated. The fundamental necessity of accurate measurement leads to more meaningful and reflective findings regarding the actual child maltreatment history of foster children, which lends to more applicable findings for the field. Therefore, successfully obtaining and clearly coding case file reports is of utmost importance, and although challenging, requires valid, reliable, and ever-evolving methodology. The SPARK project file coding research team obtained over 600 case files, adapted a reliable coding system, and systematically implemented the coding scheme by training a large team of undergraduate and graduate coders to examine maltreatment in a hard-to-access population of foster youth. The result has led to a few important lessons learned.

Because it is not feasible for coding systems like the MMCS to address every possible nuance of coding, the SPARK project sought to address the gaps we encountered. There were several lessons learned throughout the process of coding case files. One, the importance of establishing relationships with child welfare workers was imperative to best understand and utilize the reporting system used by the state. It was also essential to consult with national MCS/MMCS experts to ensure that the team was using the MMCS properly and that discrepancies were not already covered by the MMCS. Two, utilizing the MMCS as the main guideline for the file coding system while still demonstrating a flexible and adaptive process for capturing the nuances of each file was important to best reflect each maltreatment allegation for participants. For example, creating a “File Coding Rules” document allowed the team to remain reliable while retaining the flexibility required when coding the files. Three, having frequent team meetings as well as overarching rules and rules specific to each maltreatment type ensured that coding was consistent while limiting confusion and miscoding amongst SPARK team members. Four, SPARK file coding leaders uncovered innovative ways to train and assess ongoing reliability for case file coders to best ensure accuracy of the coding process. Lastly, the two-tiered coding system effectively and efficiently categorized case file information to best capture and code alleged maltreatment events within each case file.

The present discussion is one of the first for the field that provides a detailed account of file coding methodology. Although the MMCS is most commonly utilized as the main coding system to reflect a child’s maltreatment history, the field has not currently discussed how to implement this coding system in a reliable manner while addressing the nuances in each child welfare agency coding system. Given that documentation of alleged abuse events vary by state and even sometimes vary by caseworker within a state system, the current methodology provides one example of a coding system that allows researchers to code such

histories in a reliable yet flexible manner. Furthermore, the methods used by the SPARK team are one approach to quantifying complicated, but important child maltreatment data from case file reports, which remain the most common form of documentation of maltreatment in youth. The field would benefit from other reports from research teams who also code case file data so that various methods for coding and ensuring reliability can be shared and continually improved.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.chilyouth.2016.06.019>.

Table 1**Key challenges and recommendations for coding case files.**

Key challenge #1: Obtaining case files from state agencies
<p>Collaborate with CPS administrative staff to obtain files in a reliable fashion; identify a liaison to transmit case files to research lab.</p> <p>Obtain a release for each child (signed by CPS administrative staff) to ensure security and authorization of case file.</p> <p>Provide supplies to CPS administrative staff to ensure ease of case file transmission (e.g., paper, ink, FedEx secure courier labels, thorough shipping directions for securely sending case files to the lab if paper files are sent, facilitate secure e-transmission methods if electronic files are sent).</p> <p>Continually work to improve the case file procurement procedure while minimizing the workload of CPS staff.</p>
Key challenge #2: Developing collection, redaction, and coding procedures
<p>Maintain a collaborative working relationship with CPS liaison (who provides case file information to the lab and redacts identifiable information).</p> <p>Hold regular meetings between CPS staff and researchers to improve researchers' understanding of data within the case files.</p> <p>Consult with stakeholders well-versed in using the MMCS, and hold team meetings with a variety of stakeholders to identify key variables to code.</p> <p>Code all hotline calls (substantiated and unsubstantiated) in the case file while identifying duplicate reports (i.e., several calls on the same alleged incident) to avoid artificial inflation of the child's maltreatment history.</p> <p>Order hotline calls by date from earliest to latest, so that coders code the most recent hotline call last so that information in newer hotline calls that is discrepant with information in later calls is easily identified.</p> <p>Review hotline calls several times to identify the number of abuse events identified within the call (e.g., physical abuse and neglect reported within one call), and find the most appropriate corresponding MMCS code for each abuse event. If a hotline call's narrative is unclear, contact the coding team to engage in consensus coding.</p> <p>Use caution when coding the perpetrator-child relationship. Case files frequently contain conflicting information regarding perpetrator. Use the entirety of information within the file to make a final determination.</p>
Key challenge #3: Developing training and reliability procedures for efficiency and sustainability
<p>Frequent and ongoing coding team meetings are necessary to resolve (by consensus) questions that arise during coding.</p> <p>Have senior coders (preferably those in communication with CPS affiliates) deliver training and remain available to new coders for ongoing consultation.</p> <p>Allow new coders to code independently once they attend all trainings, pass training quizzes, and reach 80% interrater reliability with the senior coder.</p> <p>Senior coders (i.e., graduate students) should assume primary coding responsibilities if they deem a case file or hotline call as particularly complex, as they have a working knowledge of the MMCS and child maltreatment, in general. This may occur when deriving the events of alleged abuse from a lengthy narrative within a hotline call or when there are several duplicate reports containing conflicting data.</p> <p>More objective information (e.g., outcome of the accusation of abuse) can be coded by new coders as the information is clearly delineated within each report.</p> <p>Perform frequent reliability checks.</p>

Table 2

File coding rules to accompany the Modified Maltreatment Classification System (MMCS).

Coding categories	Rules	Examples
Overall	<p>1. Code what you see.</p> <p>2. Code conservatively if time period/other information is not available.</p> <p>3. Code events in the narrative regardless of when they happened. The exclusion to this rule is if the same event was clearly coded in a previous hotline call.</p> <p>4. Do not code when a child is a perpetrator and the victim is an adult.</p> <p>5. Do not code for abuse or neglect that has happened to other children that are not living in the child's home or are not siblings. Do code for siblings (Note: this will depend on your research question) and mark "no" to "involved study participant" on the file coding form.</p> <p>6. If there are two or more perpetrators, code multiple events (one for each perpetrator).</p> <p>7. If there are multiple abuse events for multiple children, first code the most recent event experienced by the current child whose file is being coded (and separate body parts if necessary), and then the next most recent event, etc. Then, do the same for the other children in household (who are grouped as one entity).</p> <p>8. If information is conflicting for whether the case was substantiated or unsubstantiated, or the information is not clear, default to the conclusions made by CPS workers listed in the file.</p>	<p>1. Call 1 states the child is sexually abused by her uncle. Call 2 also states the child is sexually abused by her uncle. Code Sexual Abuse 200-5 twice, as this appears to be two incidents of sexual abuse. However if Call 1 states that the uncle took off the child's clothes, took her in the bathroom, and penetrated her on the 4th of July 2014 and Call 2 repeats this information, code only one Sexual Abuse 200-5, as this is enough information to determine that this was one incident.</p> <p>2. A call states that the child has missed a lot of school. Code Educational Maltreatment 700-1 because the amount of school missed is unknown, and we cannot interpret what "a lot" means.</p> <p>3. A call states that a father punched a child in the eye last year. Code for Physical Abuse 101-2.</p> <p>4. Child hit and kicked a teacher. Do not code.</p> <p>5. The next-door-neighbor was sexually abused by the father. Do not code. The participant's sister was sexually abused by the father. Code Sexual Abuse 200-5.</p> <p>6. Mom and grandma both spank the child on the bottom with a ruler. Code two events; both Physical Abuse 103-1.</p> <p>7. Participant and his 3 siblings were punched in the chest and head. They've also been punched in the head before. Codes are: Physical Abuse 101-1 (participant), Physical Abuse 102-1 (participant), Physical Abuse 101-1 (participant), Physical Abuse 101-1 (other children), Physical Abuse 102-1 (other children), and Physical Abuse 101-1 (other children). Six codes total.</p> <p>8. The initial report says the call is unsubstantiated and the final report lists it as substantiated. The conclusion narrative says it was substantiated. Mark as substantiated.</p>
Physical	<p>1. Code multiple injuries on one body part once, unless it is clear that they are separate incidents.</p> <p>2. Code Physical Abuse 109 if the perpetrator attempted to injure the child but was unsuccessful.</p>	<p>1. A scratch and two bruises on the child's right arm is one code - Physical Abuse 104-1. A bruise from a punch on the right arm and a bruise from a belt on the right arm is two codes - 104-2 and 104-2.</p> <p>2. A parent throws a chair at the child and it misses him. Code Physical Abuse 109-1.</p>
Sexual	<p>1. Do not code if the child is engaging in sexual acts alone.</p> <p>2. Do not code if the child is engaged in mutual touching/sex play with a peer.</p> <p>3. Code any unwanted, coercive, or forced sexual activity, even if the children are peers.</p> <p>4. Do not code if an adolescent is having consensual sex with a peer, and this is legal in the state. If the adolescent is too young to have consensual sex or the perpetrator is too old according to the state law, code sexual abuse.</p>	<p>1. Child is watching pornography at parent's home while alone. Do not code.</p> <p>2. An eight-year-old girl and seven-year-old boy showed each other their genitals. Do not code.</p> <p>3. The nine-year-old girl tells her mother that her nine-year-old brother touched her vagina. Code Sexual Abuse 200-3.</p> <p>4. A 16-year-old and her same-age boyfriend had sex. Do not code. A 13-year-old had sex with her 14-year-old boyfriend. Code Sexual Abuse 200-5. A 16-year-old had sex with her 22-year-old boyfriend. Code Sexual Abuse 200-5.</p>
Emotional	<p>1. Always code if parent/caretaker tells child to not talk about maltreatment.</p> <p>2. If parent requests removal of child, only code if it is clear this was said in front of child.</p>	<p>1. Mother told child not to tell teacher about getting punched by father. Code as Emotional Maltreatment 500-15.</p> <p>2. Parent calls caseworker to take the child. Child is not present while parent is on the phone. Do not code.</p>

Coding categories	Rules	Examples
Neglect	3. Do not code if parent/caretaker was convicted of a crime (assault, theft, murder, etc.) and the child was not present.	3. Child's father murdered child's mother, but child was at school. Do not code.
	4. Code if there is a pattern of yelling (excluding derogatory names, which are a separate code) or cursing at child, but do not code if it is a one-time event.	4. Every day after school parent screams and curses at child to clean - code Emotional Maltreatment 500-37.
	5. Code any domestic violence (slapping, hitting, yelling, throwing objects) as Emotional Maltreatment 500-42.	5. Mother has kicked father and will not stop cursing at him. Code Emotional Maltreatment 500-42. The next day, mother punches father. Code Emotional Maltreatment 500-42.
	6. Code preferential treatment toward one child over another as Emotional Abuse NOS.	6. Parent made one child sleep on the floor while the other always gets the bed. Code Emotional Maltreatment NOS.
	7. Code exercise as punishment as Emotional Abuse NOS.	7. Parent forced the child to do push-ups for 1 h because she did not finish her chores. Code Emotional Maltreatment NOS.
	1. Failure to Provide Medical is coded if a qualified professional (e.g., doctor, therapist, teacher) tells the caregiver that the child needs medical/psychiatric help, not a friend or neighbor, unless there is a clear pattern of medical neglect.	1. A school nurse advises the parent to take a child to seek more advanced medical care for an arm that is suspected to be broken, but parent refuses. Code Failure to Provide Medical 304-3. A neighbor witnesses that all of the child's teeth are rotten and the child has been complaining of pain to her mother for months. Code Failure to Provide Medical 304-3.
	2. Code a more severe behavioral or emotional problem that is unattended to as Failure to Provide Medical – severity level 3. Code suicidal ideation that is unattended to as Failure to Provide Medical – severity level 4.	2. The child was diagnosed with bipolar disorder, but is not receiving treatment. Code Failure to Provide Medical 304-3.
	3. Do not code child misbehavior that has not been addressed by a professional.	3. Child with history of fire setting is setting fires on playground with a lighter that was found - do not code. However, child with history of fire setting that is setting fires with a lighter that was found on the floor of the parent/caretaker's home. Code Lack of Supervision - Environment 402-2. Child is smashing flower pots on neighbor's porch. Do not code. Child has been flipping over desks in classroom and teacher has repeatedly asked parent to seek help, but parent refused. Code Failure to Provide Medical 304-1.
Drugs/alcohol	4. If parent/caretaker mishandles funds and does not spend on food for children, only code if children have not eaten, and mark the risk factor for "insufficient/misuse of income".	4. Parent is selling food stamps to buy drugs/alcohol and children have not eaten for 72 h. Code Failure to Provide Food 301-1 and mark as a risk factor. Parent is selling food stamps but children ate at neighbor's house. Do not code but mark "insufficient/misuse of income" as risk factor.
	5. Code Failure to Provide Food if it is explicitly stated the child has missed multiple meals. Do not code if there's no food in the home, but the child is eating elsewhere.	5. Child says there's no food in home but goes over to the neighbor's house to get dinner and gets lunch at school daily. Do not code.
	6. If child's clothes are dirty, code Failure to Provide Hygiene, not Failure to Provide Clothing.	6. Child has a bad odor and his clothes have not been washed in weeks. Code Failure to Provide Hygiene 305-1.
	7. Multiple codes can be given under Failure to Provide – Shelter. If the home is both dirty and the family has had no utilities for some time, code two separate codes.	7. Home is crawling with roaches, and there is no electricity, heat, or water. Code Failure to Provide Shelter 303-2 and 303-4.
	8. Consider age, disorders, history of problematic behavior and disability when it comes to supervision or lack thereof.	8. Child is 15-years-old, is described as responsible and is left home alone for an hour after school. Do not code. However, if child is 14 and has a history of setting fires and is left at home for an hour, code Lack of Supervision 401-2.
	1. Code once per call if there is mention of drug abuse/alcoholism.	1. Parent is described as being addicted to pain killers and drinks excessive alcohol every day at home. Code Drugs/Alcohol 800-6.
	2. If there's drug paraphernalia in the home, code Drugs/Alcohol, but not Lack of Supervision – Environment, as the children do not necessarily have access to it.	2. The parent smokes marijuana occasionally and has paraphernalia hidden in her closet where the children do not have access. Code Drugs/Alcohol 800-6.