

**Copyright**

by

**Ashley Ann Pina**

**2017**

**The Report Committee for Ashley Ann Pina**

**Certifies that this is the approved version of the following report:**

**Language Functioning in Physically Abused Children**

**APPROVED BY**

**SUPERVISING COMMITTEE:**

---

Lisa M. Bedore, Supervisor

---

Jessica Franco, Co-Supervisor

**Language Functioning in Physically Abused Children**

by

**Ashley Ann Pina**

**Report**

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

**Master of Arts**

The University of Texas at Austin

December 2017

## **Dedication**

To my best friend Aron and my sister Nikki. Thank you for your wisdom and your unwavering support.

To my dad, for his timely advice and encouragement when I needed it the most. Thank you for seeing the best in me and thank you for believing in me.

## **Acknowledgements**

Dr. Lisa Bedore, I am incredibly thankful for your support and influence, academically, and personally. I deeply admire your dedication and expertise in the area of language disorders, and I am so grateful for your input and encouragement on this project. Your patience and encouragement of completing this graduate program has left a lasting impression on my life.

Dr. Jessica Franco, I am so thankful for your input on this project. Thank you for your patience and influence academically and clinically. I admire your passion and dedication to your research in social communication. Your influence, academically and clinically, has left a lasting impression on the clinician I aspire to be.

# **Language Functioning in Physically Abused Children**

by

Ashley Ann Pina, M.A.

The University of Texas at Austin, 2017

Supervisors: Lisa M. Bedore, Jessica Franco

This review sought to describe comprehensive language functioning in physically abused children with and without non-accidental head trauma (NAHT) relative to children with accidental head trauma (AHT). Research has shown childhood maltreatment has negative effects on cognitive, linguistic, and social-emotional development. Recent reviews have reported reduced language abilities in maltreated children, but the relationship between child maltreatment and language development remains poorly understood (Lum, Powell, Timms, & Snow, 2015). The limited number of studies focused primarily on linguistic outcomes and the inconsistent definitions of language and maltreatment has hindered a clear and comprehensive understanding of language functioning in maltreated children. One population within maltreated children whose language functioning is unclear due to inconsistent definitions is physically abused children. A lack of adherence to the definition of physical abuse (PA) is evidenced by exclusionary criteria placed on physically abused children with NAHT across the literature. The current consensus is neglect is the subtype of maltreatment whose population is most vulnerable to language difficulties. Results from this review suggest that physically abused children whose population includes children with NAHT are also vulnerable to mild to severe language deficits.

## Table of Contents

Introduction -----	1
Prevalence of maltreatment -----	1
The role of the speech-language pathologist -----	2
Definitions -----	3
Research question and hypothesis -----	4
Method -----	6
Results -----	8
Language functioning in children with history of PA -----	8
Language functioning in children with history of NAHT and AHT -----	10
Discussion -----	17
Clinical Implications -----	20
Future Research -----	23
References -----	24

## **List of Tables**

Table 1: Language functioning in children with PA -----	14
Table 2: Language functioning in children with NAHT -----	15
Table 3: Language functioning in children with PA -----	16

## **Introduction**

Research has shown that child maltreatment has negative effects on cognitive, linguistic and social-emotional development (Maguire, et al., 2015). However, few studies have focused on the contribution of different subtypes of maltreatment on language development, particularly the effects of physical abuse. Although recent reviews and meta-analyses report reduced language abilities in maltreated children, so few studies have been conducted on this topic that the effect of different sub-types, such as physical abuse, remains elusive. There are a few reasons a clear and comprehensive understanding of language and maltreatment cannot be ascertained across the research literature: 1) there are a limited number of studies which focus primarily on linguistic outcomes, 2) there are fewer studies that look at how certain types of maltreatment can impact language development and 3) across child maltreatment research, there are differences in how methodology and how maltreatment and language is defined.

### **Prevalence of maltreatment**

Although there is a lack of research that looks specifically at the relationship between physical abuse and language functioning, this is not reflective of the need for increased understanding regarding the relationship between the physical abuse and language development. The rate of child maltreatment cases has risen since 2010 and research suggests children with disabilities are at a higher risk for abuse. Per the most recent reports from the U.S. Department of Health and Human Services, there were 700,000 confirmed cases of child maltreatment. The most common type of maltreatment was neglect (75.3%) followed by physical abuse (17.2%) (U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau, 2017). In more severe cases of physical abuse, NAHT is the leading cause of fatalities in childhood maltreatment cases (Berger et al. 2016). It is estimated that 17-56% of brain injury in infants could be a result of NAHT (Chevignard & Lind, 2014). Children with history of NAHT have more severe outcomes, clinical severity, and brain lesions relative to children with a history of accidental brain injuries (e.g., falls, car accidents) (Lind, Toure, Brugel, Meyer, Laurent-Vannier, & Chevignard, 2016). In children who survive NAHT, nearly 70% of children will live with severe and permanent disability (Leeper, Nasr, McKenna, Berger, & Gaines, 2016). Research also suggests children with disabilities are at a higher risk for abuse. Twenty-three percent of nationally confirmed

cases of childhood maltreatment were among children with disabilities. It was also reported that children and adolescents with disabilities were 3.5 times more likely to be at risk for abuse relative to peers with disabilities. Even higher rates were found among children with specific disabilities such as intellectual disabilities, sensory disabilities, communication disorders or behavioral challenges. This finding may influence the accuracy of confirmed cases of abuse if the child's disability or impairment affects their ability to effectively communicate any abuse occurred (Jones et al., 2012; Sullivan & Knutson, 2000; Stalker & McArthur, 2012, as cited in Robinson, 2012). In a recent study, children with disabilities represented 29% of substantiated cases of childhood maltreatment (Maclean, et al., 2017). Further understanding of how various subtypes of abuse moderate language development will help inform SLPs and other professionals who work with maltreated children identify language difficulties faced by children with a history of physical abuse. This is critical because if the effects of maltreatment in young children go untreated, the consequences of maltreatment on their development can have persistent consequences. Health professionals' increased knowledge of identifying warning signs of maltreatment can help to prevent child abuse from continuing. Increased awareness of the issue of maltreatment and how it affects development will help specialized health professionals make better decisions about assessment and treatment of children with a history of abuse.

### **The role of the speech-language pathologist**

Speech-language pathologists (SLPs) are increasingly responsible for assessing and treating children who may be victims of abuse (Westby, 2007). The number of confirmed child maltreatment cases has shown an overall increase of about 1% since 2010. SLPs also have specialized training in assessing and treating the communication difficulties that may present in children with history of abuse. In addition to assessing and treating maltreated children, SLPs are also in a position to prevent child abuse. SLPs work directly with children with disabilities who are particularly vulnerable to abuse and they are federally mandated reporters of abuse and therefore need to know how to identify and report signs of abuse (Hwa-Froelich, 2012). Being knowledgeable of how maltreatment affects language development will help clinicians make informed decisions in the assessment and treatment of children with history of maltreatment.

## **Definitions**

For the purpose of this literature review, language will be broadly defined to include multiple components of language. The American Speech and Hearing Association (ASHA) offers a definition that includes three key components of language “1) the form of language or phonology, morphology, and syntax, 2) content of language also referred to as semantics and/or 3) the function of language or pragmatics” (American-Speech-Hearing Association, 1993). In addition, the definition of language in this literature review will also include receptive and expressive components of language. A broad definition of language that considers all components of language is used because it is the way SLPs conceptualize language when obtaining comprehensive assessments of language disorders in children.

Conversely, a narrow definition of maltreatment will be used to make a distinction between general maltreatment and physical abuse. Maltreatment typically consists of five subtypes of maltreatment. A broad definition of maltreatment provided by The World Health Organization (WHO) states, “Child maltreatment, sometimes referred to as child abuse and neglect, includes all forms of physical and emotional ill-treatment, sexual abuse, neglect, and exploitation that results in actual or potential harm to the child’s health, development or dignity. Within this broad definition, five subtypes can be distinguished – physical abuse; sexual abuse; neglect and negligent treatment; emotional abuse; and exploitation.” Because this paper will be examining maltreatment’s effect on one subtype of maltreatment, the definition will address physical and physical abuse that causes head injury, commonly referred to as abusive head trauma (AHT) or non-accidental head trauma (NAHT). This paper will use the terminology accidental head trauma (AHT) and non-accidental head trauma (NAHT) to describe the two groups. The U.S. Department of Health and Human Services, Administration for Children and Families, Children’s Bureau provides legal definitions of subtypes of maltreatment under the Child Abuse Prevention and Treatment Act (CAPTA). CAPTA defines physical abuse as “any non-accidental physical injury to the child and can include striking, kicking, burning, or biting the child, or any action that results in a physical impairment of the child.” Because research studies do not often specify type of physical abuse, this review will look specifically at studies that have specified types of physical abuse (U.S. Department of Health and Human Services, Administration for Children and Families, Children’s Bureau, 2010). Because research studies

do not often specify type of physical abuse, this review will look specifically at studies that have specified types of physical abuse. One such area of physical abuse that specifies types of physical abuse and effects are known to directly impact child development are various forms of head injury.

### **Research question and hypothesis**

Due to limited research and the increased need for greater understanding among health professionals on this subject, this literature review will compare language and social skills outcomes in children with children with a history of NAHT and children with AHT. This literature review will describe language functioning in physically abused children. The research questions are as follows:

- What is the language functioning of physically abused children without NAHT?
- What is the language functioning of physically abused children with NAHT?
- What is the language functioning of physically abused children with NAHT relative to children with accidental brain injury?

Research has shown that the consequences of abuse across subtypes of maltreatment can result in deficits across the developmental domains necessary for communication: language (e.g., syntax, semantics, pragmatics), social cognition and executive functioning (Coggins, Friet, & Morgan, 1998; Streissguth, 1997; Timler, Olswang, & Coggins, 2005, as cited in Hyter, 2007). Moreover, a recent study reported over 2/3 (68%) of children who survive NAHT will have diagnosed neurologic and cognitive abnormalities between the ages of 2-5, which are critical ages for language development (Hinds, Shalaby-Rana, Jackson, & Khademian, 2015). Given what is known about the negative effects maltreatment has across developmental domains (cognitive, linguistic and social), it is hypothesized that physically abused children with and without NAHT will have language deficits across all components of language (syntax, semantics, pragmatics). If this is true, the complex range of deficits in physically abused children will show the need for studies of children with history of physical abuse to be more inclusive of children with NAHTs, so that research can effectively inform practice.

Language development interconnects with multiple domains of development, including cognitive, social, emotional and physical domains. Each domain is affected by other aspects of development. If physical trauma or emotional trauma disrupts any of the domains, all domains

will be affected in some way (Paul, 2017). Due to the complex constellation of deficits that manifest across the domains of development, language outcomes will be coded based on domains described in the model of “Pinball Wizardy” of spoken language and written language processing (Nelson, 2010). The model describes language and written language processing as a complex process that interlinks multiple domains of language. The domains of language include semantic knowledge, syntactic knowledge, graphophonemic knowledge, input/output modalities, discourse knowledge, pragmatic knowledge, world/prior knowledge and executive control. Learning and producing language requires competency in all domains. Learning and mastering all domains of language strengthens the connection that exists between them. How well the child learns the skills within each domain ultimately determine the child’s overall language competency. If one area of language is affected, it can negatively impact other ways. In other words, learning and mastering these domains of language early ultimately determines how well a child will learn and use language. In the case of child with a history of maltreatment such as physical abuse, the emotional and physical trauma from the abuse will cause adverse effects on brain development and will have a negative impact on cognitive, emotional, behavioral, motor, social and physical health. In the case of brain injury, the diffuse injury will disrupt the neural connectivity in the brain and make learning difficult (Paul, 2017). For children with a history of trauma and physical abuse, the impact of the emotional and physical trauma may set forth a neurobiological change that manifests a complex range of deficits across multiples aspects of development.

## Method

A methods section is included to provide an overview of the selection process for studies included in this review. Because the research literature within the scope of physical abuse uses a broad range of keywords to describe the same type of maltreatment, keywords used in literature searches will be listed. In addition, criterion for how research articles were selected will also be provided. Factors considered when selecting criterion for study selection included how language was defined in the study, how comprehensive and reliable the outcome measures were and which subtype(s) of maltreatment were included in the clinical samples.

Studies were found through a systematic search in Google Scholar. The search for articles was initiated in August 2015 and repeated at various points until February 2017. The search yielded studies between 1976-2017. The use of professional terminology was used to find articles relevant to the field of speech-language pathology. The search terms included: “speech language pathologist”, “speech pathologist”, “speech language pathology”, and “speech pathology”. Terms for language and social use of language were included so that comprehensive profile of language could be obtained. Keywords included: “communication”, “language”, “linguistic”, “pragmatics”, “social skills”, “social competence” and “social interaction”. To find articles that investigated language outcomes in head injury and physical abuse, the following search terms were used: “maltreatment”, “abusive head trauma” or “AHT”, “inflicted head trauma”, “pediatric”, “brain injury” or “head injury”, “accidental head trauma”, “non-accidental head trauma” or “physical abuse” or “physically abused”.

A set of criteria was applied to studies included in this review for the purpose of relevance and study quality. Studies included controlled for subtype of abuse, used language outcome measures that measured at least two domains of language (e.g., expressive language, receptive language, and pragmatics), and used outcome measures with high reliability and high validity (>.80). Studies that used language outcome measures with low reliability and validity and whose clinical samples included children with a history of more than one subtype of maltreatment were omitted. Due to the limited number of studies that looked at pragmatics or social skills as it relates to language and physical abuse, exceptions were made for studies that looked at pragmatic language outcomes only. The age of participants in studies was restricted to age >2 years of age. Once again, exceptions for studies that included children younger than 2

years of age if the studies looked specifically at social development in children with or without history of abuse. Language development in children with head injury followed similar criteria. The total number of studies found meeting the above criterion were 14 studies on language and physical abuse and 6 studies on language and non-accidental head trauma.

Of the seven domains of language identified in the Pinball Wizardry model, five were used to code language outcomes: semantic knowledge, syntactic knowledge, graphophonemic knowledge, input/output modalities, discourse knowledge, pragmatic knowledge, world/prior knowledge and executive control (Nelson, 2010). It should be noted that due to limited information on this subject, the language domains of input modalities or world/prior knowledge were not coded in comparisons of groups

## Results

The research literature on language functioning in children with history of physical abuse and abusive head trauma was reviewed and language outcomes were coded under the following domains of language: semantic knowledge, syntactic knowledge, graphophonemic knowledge, discourse knowledge, pragmatic knowledge, and executive control. The language outcomes in children with physical abuse is described broadly in isolation from a comparison group. The language outcomes in children with history of non-accidental head trauma (NAHT) will be described relative to children with a history of accidental head trauma (AHT).

### **Language functioning in children with history of PA**

**Language.** Children with history of physical abuse have language difficulties across the domains of language development (see Table 1). Studies have shown that physically abused children scored significantly lower than non-abused children on standardized measures of language performance and verbal abilities on tests of intelligence relative to non-abused peers (Blager & Martin, 1976; Martin, Beezley, Conway, & Kempe, 1974; Oates, Forrest, & Peacock, 1984). Subsequent studies found neglect groups scored lowest in receptive and expressive scores relative to physical abuse groups. Thus, researchers concluded that neglect was the subtype of abuse most strongly associated with language delay (Allen & Oliver, 1982; Fox, Long, & Langlois, 1988, as cited in McCauley & Swisher, 1987). Other studies reported expressive and receptive language delays across maltreatment types. Delays in language abilities were found when the language outcomes in physically abused children relative to children with a history of neglect and/or physical abuse and non-maltreated peers (Culp, et al., 1991; Perry, Doran, & Wells, 1983, Prasad, Kramer, and Ewing-Cobbs, 2005). These findings are consistent with recent meta-analyses that looked broadly across subtypes of maltreatment and its effect on language development. These studies found children with a history of physical abuse may present with delays in both expressive and receptive language. Children with a history with physical and/or abuse had language scores that were .54 standard deviations (SDs) lower than non-maltreated peers. Delay in pragmatics was also found in addition to delays language expressive and receptive language (Sylvestre, Bussi eres, & Bouchard, 2016). Similar results were found when factors such as age, gender, maternal education and SES were controlled (Lum, Powell, Timms, & Snow, 2015).

**Semantic and syntactic knowledge.** Children with history of physical abuse may have language delays in both semantic and syntactic knowledge. Findings suggest that physical abuse is associated with delay in vocabulary development and producing syntactic structures. The children's syntactic production was assessed with the Index of Productive Syntax (IPSyn) and through a speech sample that itemized their productions of morphological structures (Scarborough, 1990). The children with a history of maltreatment scored lower on the IPSyn and produced fewer complex structures than their non-maltreated peers (Eigsti & Cicchetti, 2004).

**Graphophonemic knowledge.** Fuller-Thomson and Hooper (2015) surveyed 13,054 adults taken from a child welfare sample on their history of childhood physical abuse and known diagnosis of dyslexia. Results showed that 34.8% of respondents reported physical abuse and a diagnosis of dyslexia as compared to 7.2% of respondents who reported a dyslexia diagnosis with no history of physical abuse. Researchers suggest an association between physical abuse and the diagnosis of dyslexia. However, due to unreliable assessment in the form of self-report and participants who were recruited through child welfare, more research is needed to understand if a relationship between physical abuse and dyslexia exists. No speech deficits were reported but in one study, motor behavior rated by caregivers was lower in physically abused children relative to the control group (Prasad, Kramer, & Ewing-Cobbs, 2005).

**Pragmatics and discourse.** Pragmatic or social skills as they relate to communication include conversational limitations such as initiating conversation, topic maintenance, management or reference of listener, reading social cues expressed through language forms (Adams, Gaile, Lockton, & Freed, 2015). Studies have shown physically abused children had poorer social skills relative to non-maltreated peers (Perry, Doran & Wells, 1983; Rogers & D'Eugenio, 1981). Barahal, Waterman and Martin (1981) found physically abused school aged children had difficulty in tasks involving story retell from different perspectives of characters in the story relative to non-maltreated peers. In addition to challenges with perspective taking, children with chronic physical maltreatment demonstrated a diminished ability to sustain close friendships with their peers (Bolger, Patterson, & Kupersmidt, 1998). The difficulty sustaining friendship is likely due to high rates of withdrawn behavior demonstrated by physically abused children relative to non-maltreated children (Haskett & Kistner, 1991). Physically maltreated children are also shown to develop negative reactions towards their caregivers, which leads to

difficulties with emotion regulation in social settings. Moreover, maltreated children have difficulty identifying and understanding facial expressions and emotions displayed by others (Barahal, Waterman, & Martin, 1981; Camras, Grow, & Ribordy, 1983; During & McMahon, 1991) and are less attentive to cues in social contexts (Landry, Swank, Stuebing, Prasad, & Ewing-Cobbs, 2004). Physically maltreated children are also shown to develop negative reactions towards their caregivers, which leads to difficulties emotion regulation in social settings. This difficulty in accurately reading emotions of others in combination with withdrawn behavior leads to reduced communication initiations with peers and can ultimately lead to peer rejection. Example of a behavior that leads to peer rejection include misinterpreting someone's intent or acting out due to difficulties in interpreting social cues. All of these factors can negatively affect a child's discourse and overall ability to socialize with others. While there is a lot of evidence to suggest children with history of physical abuse have difficulties with pragmatic language, there was one finding that suggests that their pragmatic abilities do not differ from their maltreated peers with respect to pragmatic skills. In Prasad, Kramer, and Ewing-Cobbs (2005) the communication and social functioning of the children in the physical abuse group were comparable to functioning of the community comparison group. Although the children with history of physical abuse performed significantly lower on measures of cognitive functioning, research suggests that cognitive deficits may not be severe enough to negatively impact their ability to communicate and socialize with others.

**Executive control and working memory.** Children with history of physical abuse performed significantly lower than the control group on measures of cognitive functioning but their performance was not low enough to negatively impact their ability to function. The children with physical abuse had similar daily living skills in comparison to their non-maltreated peers (Prasad, Kramer, & Ewing-Cobbs, 2005).

### **Language functioning in children with history of NAHT and AHT**

**Language.** Children with a history of accidental head trauma and non-accidental head trauma presented with high rates of impairments across the domains of language and executive control (see Table 2 and Table 3). Studies report children with NAHT have a wide range of deficits and outcomes for this population are poor (Chevignard & Lind, 2014). Barlow et al. (2005) found that nearly 70% of the infants with inflicted brain injury had language difficulties.

The studies that have indirectly investigated language functioning in children are retrospective studies that look at long-term developmental outcomes of children with NAHT. The hallmark deficit in children with NAHT is speech and language difficulties, which accounted for 37-64% of children with NAHT. It was also reported 23-59% of children with NAHT presented with deficits in executive control, specifically attention, memory inhibition or initiation deficits (Chevignard & Lind, 2014). Stipanovic, Nolin, Fortin, and Gobeil (2008) also found that children with shaken baby syndrome performed significantly worse on language tasks than peers without traumatic brain injury (TBI) (Ashton, 2010). Language delay are often associated with marked broader cognitive impairment and behavioral abnormalities, paucity of speech or profound language problems. Of the 23 studies reviewed on children with NAHT, found 78% of children required intensive speech and language therapy up to 8 years post injury (Chauvingard & Lind, 2014). Similarly, children with history of AHT, cognitive impairments affected all language modalities including listening, speaking, gesturing, reading, or writing); and any of the linguistic domains: phonology, morphology, syntax, semantics, or pragmatics (Turkstra, Politis, & Forsyth, 2015).

**Semantic and syntactic knowledge.** In a prospective study where sequential assessment of language development was performed, the development quotient in speech and language decreased in five of the 11 patients (Chevignard & Lind, 2014). Stipanovic, Nolin, Fortin, G and Gobeil (2008) reported difficulties with comprehending instructions and verbal fluency in children with mild brain injury relative to the matched control group. The difficulties were more challenging when more complex cognitive functions (e.g., working memory) were used simultaneously. Children with severe NAHT have long-lasting impairments in language. There was no data on syntactical knowledge in children with NAHT. Children with accidental brain injury had similar language difficulties but there was more detailed information regarding syntactic and semantic language abilities. They had difficulty comprehending complex language forms (e.g. with embedded clauses) and language that placed demands on the child's working memory (e.g., if information provided too slowly or too quickly for child to process and understand). It was also reported that word-finding difficulties (e.g., word association, naming) contributed to reduced verbal fluency and difficulties with vocabulary affected auditory comprehension (Hay & Moran, 2005; Turkstra, Politis, & Forsyth, 2015).

**Graphophonemic knowledge.** Due to delays in motor development or motor deficits, dysarthria may co-occur with language difficulties (Lind, Toure, Brugel, Meyer, Laurent-Vannier, & Chevignard, 2016). Research has reported that 37-64% of children with NAHT will present with speech difficulties, including dysarthria (Chevignard & Lind, 2014). The motor deficits could also make writing difficult. In one study, it was found that over half of the participants had visual-spatial and difficulty with graphic/drawing. This can impact language development by affecting a child's difficulties with reading and writing (Lind, Toure, Brugel, Meyer, Laurent-Vannier, & Chevignard, 2016). Children with accidental brain injury also demonstrated difficulties with speech difficulties and reading. Children with sustained brain injury were more likely to have difficulties with reading than children who had learned to read before their brain injury (Barnes, Dennis, & Wilkinson, 1999, as cited in Ashton, 2010). Children whose injury occurs earlier in childhood, before or during the time the child is learning to read, the child will be at risk for developing reading skills are at risk for basic decoding skills. These decoding skills are compounded by reduced processing speed as a result of cognitive deficits caused by the injury. Moreover, children who have difficulties with vocabulary acquisition may also hinder reading and auditory comprehension (Turkstra, Politis, & Forsyth, 2015).

**Pragmatics and discourse.** In a study that compared children with NAHT with accidental injury, the children with inflicted injuries showed fewer behaviors in the domains of cognitive and social domains of development. They expressed a reduction in the following social behaviors: initiating social interaction, showing responsive to examiner-initiated interactions, compliance and positive affect (Ewing-Cobbs, Prasad, Mendez, Barnes, & Swank, 2013). There is also a high co-occurrence of behavioral disorders in children with NAHT, with one study reporting half of the cases of children with NAHT presented with a behavioral disorder. Behavioral difficulties observed included agitation, irritability, impulsivity, intolerance to frustration and temper tantrums. Behavioral challenges can in turn negatively affect the child's communication. For instance, it can affect discourse if a child is impulsive and has difficulties taking turns with peers. Some children have shown to lack initiative which can also negatively impact a child's ability to develop peer relationships (Lind, Toure, Brugel, Meyer, Laurent-Vannier, & Chevignard, 2016). Similarly, a range of behavioral disorders and a range of social difficulties followed accidental TBI (Li, & Liu, 2013). Pediatric TBI is linked specifically to

attention-deficit-hyperactivity disorder (ADHD), conduct and oppositional defiant disorders, mood disorders, and anxiety disorders (e.g., PTSD). Several studies have shown difficulties in emotion recognition from facial expressions and making inferences about feelings and intent of others. Impaired problem-solving in social contexts due to impairments in social cognition and executive function is also present in children with AHT. In measures of discourse, such as retelling stories, children had difficulty with organizing information in logical sequences, taking turns, and using language for specific goals (e.g., negotiation, giving hints, using humor or sarcasm) (Turkstra, Politis, & Forsyth, 2015).

**Executive control and working memory.** About 23-59% of children with inflicted brain injuries may present with impairment to executive control (Chevignard & Lind, 2014). Nolin, Fortin, and Gobeil (2008) reported significant impairment in mental organization, divided attention, memory (retrieval), reasoning, planning, mental alternation, inhibition, initiation, and slower execution time in comparison to matched controls (Chevignard & Lind, 2014; Nolin, Fortin, and Gobeil, 2008). Outcomes for children with accidental pediatric brain injury also include impairments involving cognitive functions including attention, working memory, declarative learning, and social cognition. Research suggests, however, that pediatric brain injury impact on language is not due to a language impairment, but rather the communication disorder is caused by the underlying impaired cognitive function (Turkstra, Politis, & Forsyth, 2015).

Children with history of NAHT exhibited more difficulties with working memory (Chevignard & Lind, 2014). They also demonstrated greater difficulties with memory for retrieval relative to matched control group. It was also reported that memory deficits affected comprehension of instructions and verbal fluency in children more mildly impaired when compared to matched controls. Children struggled more when tasks became more complex and when more than one cognitive functions, such as working memory, was used simultaneously with another cognitive function (Nolin, Fortin, and Gobeil, 2008). In children, who have a history of accidental brain injury, it is reported that children with mild to moderate TBI have ongoing memory problems (Ashton, 2010). Children with accidental TBI have underlying impairment to working memory that compounds language difficulties across linguistic domains (Turkstra, Politis, & Forsyth, 2015).

**Table 1.** *Language functioning in children with PA*

Semantic and syntactic knowledge	Graphphonemic knowledge	Pragmatics and discourse	Executive control and working memory
<ul style="list-style-type: none"> <li>• Delays language expressive and receptive language (Lum, Powell, Timms, &amp; Snow, 2015; Sylvestre, Bussi�eres, &amp; Bouchard, 2016)</li> <li>• Delay in vocabulary development and producing syntactic structures (Eigsti &amp; Cicchetti, 2004)</li> </ul>	<ul style="list-style-type: none"> <li>• Possible link between physical abuse and the diagnosis of dyslexia (Fuller-Thomson and Hooper, 2015)</li> <li>• Caregiver ratings of motor behavior were lower for the physically abused relative to control (Prasad, Kramer, &amp; Ewing-Cobbs, 2005)</li> </ul>	<ul style="list-style-type: none"> <li>• Poorer social skills relative to non-maltreated peers (Perry, Doran &amp; Wells, 1983; Rogers &amp; D'Eugenio, 1981)</li> <li>• Difficulty in perspective taking (Barahal, Waterman and Martin, 1981)</li> <li>• High rates of withdrawn behavior and have difficulty sustaining friendship (Haskett &amp; Kistner, 1991; Bolger, Patterson, &amp; Kupersmidt, 1998)</li> <li>• Difficulty with emotion regulation in social settings and identifying and understanding facial expressions and emotions displayed by others (Barahal, Waterman, &amp; Martin, 1981; Camras, Grow, &amp; Ribordy, 1983; During &amp; McMahon, 1991)</li> <li>• Less attentive to social cues (Landry, Swank, Stuebing, Prasad &amp; Ewing-Cobbs, 2004)</li> <li>• May demonstrate social skills comparable to non-maltreated peers</li> </ul>	<p>Performed significantly lower than the control group on measures of cognitive functioning; daily living skills comparable to non-maltreated peers (Prasad, Kramer, &amp; Ewing-Cobbs, 2005)</p>

PA, physical abuse, NAHT, non-accidental head trauma, AHT, accidental trauma

**Table 2.** *Language functioning in children with NAHT*

Semantic and syntactic knowledge	Graphphonemic knowledge	Pragmatics and discourse	Executive control and working memory
<ul style="list-style-type: none"> <li>• Impairment across the domains of language (Barlow et al., 2005)</li> <li>• Performed significantly worse on language tasks than peers without TBI (Stipanovic, Nolin, Fortin, and Gobeil, 2008)</li> <li>• Impairment is long lasting; most children require intensive speech and language therapy up to 8 years post injury (Chauvingard &amp; Lind, 2014; Stipanovic, Nolin, Fortin, G &amp; Gobeil. 2008)</li> </ul>	<ul style="list-style-type: none"> <li>• Mild-severe language difficulties often associated with speech difficulties such as paucity of speech or dysarthria (Chauvingard &amp; Lind, 2014; Lind, Toure, Brugel, Meyer, Laurent-Vannier, &amp; Chevignard, 2016)</li> <li>• Difficulties with writing due to motor difficulties</li> <li>• Graphic/drawing impacted by visual-spatial difficulties and may further impact challenges in reading and writing (Lind, Toure, Brugel, Meyer, Laurent-Vannier &amp; Chevignard, 2016)</li> </ul>	<ul style="list-style-type: none"> <li>• Broad range of behavioral abnormalities (Chauvingard &amp; Lind, 2014)</li> <li>• Underlying/co-occurring behavioral disorder marked by frequent agitation, irritability, impulsivity, intolerance to frustration and temper tantrums (Lind, Toure, Brugel, Meyer, Laurent-Vannier, &amp; Chevignard, 2016)</li> <li>• Reduced behaviors within domains of cognitive and social (e.g., initiating social interaction, showing responsive to examiner-initiated interactions, compliance and positive affect) (Ewing-Cobbs, Prasad, Mendez, Barnes, &amp; Swank, 2013)</li> </ul>	<ul style="list-style-type: none"> <li>• Impairment across the domains executive control; significant impairment mental organization divided attention, memory (retrieval) reasoning, planning, mental alternation, inhibition, initiation, slower execution time in comparison to matched controls (Chevignard &amp; Lind, 2014; Nolin, Fortin, and Gobeil, 2008)</li> <li>• Difficulties with working memory; difficulties with memory for retrieval; memory deficits affected comprehension of instructions and verbal fluency (Nolin, Fortin, and Gobeil, 2008.)</li> </ul>

PA, physical abuse, NAHT, non-accidental head trauma, AHT, accidental trauma

**Table 3.** *Language functioning in children with AHT*

Semantic and syntactic knowledge	Graphphonemic knowledge	Pragmatics and discourse	Executive control and working memory
<ul style="list-style-type: none"> <li>• Reduced receptive and expressive language abilities due to cognitive deficits; affects development in the areas of syntax and semantics; (Turkstra, Politis, &amp; Forsyth, 2015)</li> <li>• Difficulties learning vocabulary; word-finding difficulties (e.g., word association, naming), reduced verbal fluency; difficulties with comprehending complex language forms (e.g. embedded clauses, instructions) due to demands placed on working memory (Stipanivic, Nolin, Fortin, G and Gobeil, 2008; Hay &amp; Moran, 2005; Turkstra, Politis, &amp; Forsyth, 2015).</li> </ul>	<p>Cognitive impairments affect reading and writing abilities; affects phonology and morphology (Turkstra, Politis, &amp; Forsyth, 2015)</p>	<ul style="list-style-type: none"> <li>• Affects domain of pragmatics; difficulty using gesturing as a language modality (Turkstra, Politis, &amp; Forsyth, 2015)</li> <li>• Difficulties in emotion recognition from facial expressions and making inferences about feelings and intent of others.</li> <li>• Impaired problem-solving in social contexts due to impairments social cognition and executive function</li> <li>• Difficulties in discourse (e.g., retelling stories, organizing information in logical sequences, taking turns, and using language for specific goals; difficulties with using language to negotiate, give hints, use humor or sarcasm (Turkstra, Politis, &amp; Forsyth, 2015)</li> </ul>	<ul style="list-style-type: none"> <li>• Cognitive impairments affect all language modalities (e.g., listening, speaking, gesturing, reading, or writing; impaired attention, declarative learning, and social cognition (Turkstra, Politis, &amp; Forsyth, 2015)</li> <li>• Ongoing memory problems (Ashton, 2010)</li> <li>• Underlying impairment to working memory that compounds language difficulties across linguistic domains (Turkstra, Politis, &amp; Forsyth, 2015)</li> </ul>

PA, physical abuse, NAHT, non-accidental head trauma, AHT, accidental trauma

## Discussion

In sum, children with a history of physical abuse and NAHT present with language delays in both receptive and expressive language and pragmatic language. They may also present with deficits in executive control and social cognition. Children showed to have lower language skills on reliable and valid measures of language including the *PLS*, *CELF-P* and *CELF-3* (Zimmerman, Steiner, Pond, & Bron, (1979); Allen & Oliver, 1982; Culp et al., 1991; Prasad, Kramer, & Ewing Cobbs, 2005; Lum, Powell, Timms, & Snow, 2015).

Children with a history of physical abuse are at risk for both expressive and receptive delays in language when factors such as age, gender, maternal education and SES were controlled (Lum, Powell, Timms, & Snow, 2015; Sylvestre, Bussi eres, & Bouchard, 2016). On average, children scored .54 standard deviations (SDs) lower than non-maltreated peers (Sylvestre, Bussi eres, & Bouchard, 2016). Children demonstrated difficulty with vocabulary and producing syntactic structures and a possible relationship between dyslexia and physical abuse (Eigsti & Cicchetti, 2004; Fuller-Thomson and Hooper, 2015). Children also presented deficits in pragmatic language (Sylvestre, Bussi eres, & Bouchard, 2016). Children presented with difficulties with discourse tasks such as story retell and perspective taking (e.g., taking perspectives of different characters in a story). Children's social competence was also negatively affected as evidenced by deficits in pragmatic language and discourse. This in turn posed challenges initiating communication and expressing attentiveness in social situations, sustaining close friendships with peers, reading emotions and facial expressions in others, regulating their own emotions, and misinterpreting social cues (Bolger, Patterson, & Kupersmidt, 1998, Barahal, Waterman, & Martin, 1981; Camras, Grow, & Ribordy, 1983; During & McMahon, 1991, Landry, Swank, Stuebing, Prasad, & Ewing-Cobbs, 2004)

Children with a history of NAHT also presented with deficits across the domains of language and executive functioning. Likewise, children with history of accidental head trauma also present with cognitive impairments that affects all language modalities (e.g., listening, speaking, gesturing, reading, or writing); and may affect any of the linguistic domains (e.g., phonology, morphology, syntax, semantics, or pragmatics) (Turkstra, Politis, & Forsyth, 2015). Children with NAHT present with difficulties in verbal fluency, word-finding difficulties and auditory comprehension. Comprehension difficulties were compounded by tasks that placed

demands on working memory. Deficits to motor functioning and visuospatial deficits that led to difficulty with speech and graphic/drawing. Visuospatial deficits and graphic/drawing challenges posed challenges for reading and writing (Lind, Toure, Brugel, Meyer, Laurent-Vannier, & Chevignard, 2016). Children who learned how to read before injury had greater difficulties with reading, whereas younger children had difficulty with basic decoding (Barnes, Dennis, & Wilkinson, 1999, as cited in Ashton, 2010). In terms of executive functioning, children with history of physical abuse performed significantly lower than non-maltreated peers on measures of cognitive functioning (Prasad, Kramer, & Ewing-Cobbs, 2005). Relative to children with accidental injuries, children with inflicted injuries showed significant number of difficulties in cognitive and social behaviors including, initiating social interaction, showing responsive to examiner-initiated interactions, compliance and positive affect (Ewing-Cobbs, Prasad, Mendez, Barnes, & Swank, 2013). Given these results, it is possible that children with history of physical abuse present with more severe pragmatic language deficits relative to children with non-accidental injury. As for executive functioning, reported significant impairment mental organization divided attention, memory (retrieval) reasoning, planning, mental alternation, inhibition, initiation, slower execution time in comparison to matched controls (Chevignard & Lind, 2014; Nolin, Fortin, and Gobeil, 2008). Likewise, accidental pediatric brain injury also includes impairments involving cognitive functions including attention, working memory, declarative learning, and social cognition (Turkstra, Politis, & Forsyth, 2015).

Developmental outcomes across children with history of physical abuse, with and without NAHT, are consistent with the findings that the negative effects of maltreatment can create deficits across multiple developmental domains necessary for communication: language (e.g., syntax, semantics, pragmatics), social cognition and executive functioning (Coggins, Friet, & Morgan, 1998; Streissguth, 1997; Timler, Olswang, & Coggins, 2005, as cited in Hyter, 2007). This review suggests a need for further investigation of possibility of physically abused are at not only at risk for language delay or language impairment (LI). Children may also be at risk for pragmatic deficits or social communication disorder (SCD). These findings were evidenced by conversational limitations that may manifest into lack of conversation initiations or unbalanced conversations due to withdrawn behavior and difficulty with perspective taking, difficulty

reading social cues and topic maintenance if emotion regulation manifests into misinterpreting emotions or intent of the speaker.

## **Clinical Implications**

For SLPs to feel confident and knowledgeable in preventing and identifying childhood abuse, they need to be informed upon certain factors related to populations at risk for physical abuse. First, they should be knowledgeable of populations at risk for trauma and abuse. Children with disabilities represent 29% of substantiated cases of abuse. The following groups of children may be particularly vulnerable for abuse due to increased likelihood that the children won't or won't be able to express abuse has occurred: children who lack the linguistic skills, children who experience increased occurrence of social isolation or express immature behaviors and children who are overly compliant with caregivers they depend on for communication and daily living functions such as mobility or personal hygiene are also at risk for abuse (Johnson, 2012). One group of children that may be at risk for language difficulties as a result of maltreatment may be children in and out of the foster care system. One in five children with confirmed cases of abuse will end up in the foster care system and 55% of foster care parents have taken their child to see a SLP. Second, they should be knowledgeable and confident in their role as a federally mandated reporter. In 2015, there were 2 million reports of child abuse that warranted further investigation, and over 60% of the cases were filed by professionals with 40% of professionals coming from the areas of education and medicine (Byrne & Lyddard, 2017). A basic knowledge of how to report abuse might give SLPs the assurance and confidence that is needed to report and prevent abuse.

### **Signs of maltreatment and reporting abuse**

While SLPs know that they are federally mandated reporters of child abuse, they may not know signs of abuse or they may not know what to do if they notice signs of abuse when working with a child during a session. Behaviors to look out for in children with disabilities who may be experiencing abuse or neglect include poor health such as chronic fatigue, obesity or hypertension (Johnson, 2012). They may also express insecure attachments with caregivers. These behaviors vary by age but may include avoiding communication or contact with caregivers, turning away or leaning away when picked up. The child may 'freeze', cry, run away, or stand up and then huddle on the floor when reunited with caregivers (Holmes, 2014). The child and caregiver may also avoid eye contact with one another. Other signs of abuse may be occurring between a caregiver and child include parent showing lack of concern for child's

wellbeing, blames the child for problems he has at school or at home, asks teachers or others that it is ok to use harsh punishment with their child, views the child as a burden in their life, or if the caregiver has unrealistic demands on the child's academic performance. If a speech pathologist suspects abuse is occurring in the home should refer to the state laws regarding reporting child abuse which includes phone numbers and protocols for reporting suspected abuse. This information can be found at Child Welfare Information Gateway's (2010B) "Mandatory Reporters of Child Abuse and Neglect Summary of State Laws". If SLPs have any uncertainties about reporting abuse, they can call Childhelp Hotline at 1-800-4-A-Child (Johnson, 2012).

### **Assessment and treatment of maltreated children**

Lastly, SLPs should aware of potential differences in how children with history of abuse may be assessed and treated relative to children without history of abuse or trauma. Given physical abuse puts children at risk for delays across the domains of language, pragmatic language, social cognition, and executive function, SLPs will need to aware of these children's unique needs so that they can make appropriate assessment and treatment decisions. SLPs should also integrate and collaborate with a multidisciplinary team to ensure the diverse range of needs are met. Depending on severity of impairment, child may need ongoing assessment as communication needs emerge and/or change over the course of development.

SLPs may need to include assessment and treatment of social skills deficits along with language testing of expressive and receptive language abilities. It is important that maltreated children who are inhibited during social interaction be screened for social communication disorder (SCD). SCD is defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) as "a persistent deficit in pragmatic development that affects social functioning with additional persistent language difficulties but without restricted, repetitive behaviors." Not only are their known links to social competence and academic outcomes, but it is also the role of the SLP to assess and treat both language and social impairments in children (Adams, Gaile, Lockton, & Freed, 2015). If these social skills are not addressed early on, like language, children will become in building social skills necessary for thriving in an increasingly complex social world. It is important these skills are identified along with potential language difficulties. Without these social skills, physically abused children will

not have the same opportunities as their peers for developing and maintaining meaningful friendships with their peers and valuable relations with healthy role models.

### **Resources**

Provides are few resources that provide more detailed information about the welfare system, providing therapy for maltreated children and cultural considerations when identifying child maltreatment

- Hwa-Froelich (2012) “Childhood Maltreatment and Communication Development” and Lum, Powell, Timms, Snow (2015) “A Meta-Analysis of Crosss Sectional Studies Investigating Language in Maltreated Children” provide a more thorough summary and review of language outcomes across all subtypes of abuse
- Paul (2017) “Neurobiological Implications of Maltreatment” in What to Do When Children Clam Up in Psychotherapy: Interventions to Facilitate Communication, provides detailed information about therapy considerations for children with a history of maltreatment
- Rogers-Adkinson & Stuart (2007) “Collaborative Services: Children Experiencing Neglect and the Side Effects of Prenatal Alcohol Exposure” provides detailed information about the role of the SLP in the welfare system.
- Westby (2007) “Child Maltreatment: A Global Issue” cultural considerations to make when identifying maltreatment such as understanding variations in discipline across cultures

## **Future Research**

Future research should consider broadening the definition of language when investigating language outcomes in children with history of maltreatment, specifically physical abuse and NAHT. Inconsistencies in how language is defined has yielded studies that don't always provide comprehensive language profiles of language functioning in maltreated children. Few studies define language to consist of both expressive and receptive language. Even fewer address the three components of language (semantics, syntax and pragmatics) as defined by ASHA. A broader definition of language would also inform the use of comprehensive outcome measures thus providing more insight into the language functioning in maltreated children.

The sample should include participants that represent the maltreatment subtype(s) under investigation. The sample should be representative of how maltreatment is defined in study. For instance, physical abuse is defined as “any non-accidental physical injury to a child” and this may include children with history inflicted or non-accidental head trauma. Therefore, if physical abuse is the focus group in the study, children with a history of NAHT should be considered for inclusion in the maltreatment sample, or addressed separately in its own sample. If children with NAHT are excluded from studies about children with a history of physical abuse, outcomes may no longer be representative of the children affected by physical abuse. Moreover, by omitting brain injury, researchers may be removing the most severe form of physical abuse, thus reducing the severity of communication deficits in physically abused children relative to neglected children.

Future research should continue investigating severity of language functioning across all subtypes of maltreatment. While it may not be clear whether or not maltreatment type(s) moderates language functioning in maltreated children, a recent consensus in the field is that that all maltreated children, regardless of subtype, demonstrate language delay. The definition of maltreatment may need look more closely at subtypes to gain a better understanding of this relationship.

## References

- Adams, C., Gaile, J., Lockton, E., & Freed, J. (2015). Integrating language, pragmatics, and social intervention in a single-subject case study of a child with a developmental social communication disorder. *Language, Speech, and Hearing Services in Schools, 46*(4), 294-311.
- Allen, R. E., & Oliver, J. M. (1982). The effects of child maltreatment on language development. *Child Abuse & Neglect, 6*(3), 299–305.
- American Speech-Language-Hearing Association. (1993). *Definitions of communication disorders and variations*. Retrieved from: <http://www.asha.org/policy/RP1993-00208/>.
- Ashton, R. (2010). Practitioner Review: Beyond shaken baby syndrome: what influences the outcomes for infants following traumatic brain injury? *Journal of child psychology and psychiatry, 51*(9), 967-980.
- Barahal, R. M., Waterman, J., & Martin, H. P. (1981). The social cognitive development of abused children. *Journal of Consulting and Clinical Psychology, 49*(4), 508.
- Blager, F., & Martin, H. P. (1976). Speech and language of abused children. *The Abused Child. A Multidisciplinary Approach to Developmental Issues and Treatment, 5*, 83-92.
- Berger, R.P., Fromkin, J., Herman, B., Pierce, M.C., Saladino, R.A., Flom, L., Tyler-Kabara, E.C., McGinn, T., Richichi, R. and Kochanek, P.M., (2016). Validation of the Pittsburgh Infant Brain Injury Score for abusive head trauma. *Pediatrics*, e20153756.
- Bolger, K. E., Patterson, C. J., & Kupersmidt, J. B. (1998). Peer relationships and self-esteem among children who have been maltreated. *Child Development, 69*, 1171-1197.
- Chevignard, M. P., & Lind, K. (2014). Long-term outcome of abusive head trauma. *Pediatric Radiology, 44*(4), 548-558.
- Culp, R. E., Watkins, R. V., Lawrence, H., Letts, D., Kelly, D. J., & Rice, M. L. (1991). Maltreated children's language and speech development: Abused, neglected, and abused and neglected. *First Language, 11*(33), 377-389. [doi:10.1016/0145-2134\(82\)90033-3](https://doi.org/10.1016/0145-2134(82)90033-3).
- Eigsti, I. M., & Cicchetti, D. (2004). The impact of child maltreatment on expressive syntax at 60 months. *Developmental Science, 7*(1), 88-102.

- Elliott, G. C., Cunningham, S. M., Linder, M., Colangelo, M., & Gross, M. (2005). Child physical abuse and self-perceived social isolation among adolescents. *Journal of Interpersonal Violence, 20*(12), 1663-1684.
- Ewing-Cobbs, L., Prasad, M. R., Mendez, D., Barnes, M. A., & Swank, P. (2013). Social interaction in young children with inflicted and accidental traumatic brain injury: relations with family resources and social outcomes. *Journal of the International Neuropsychological Society, 19*(05), 497-507.
- Fox, L., Long, S. H., & Langlois, A. (1988). Patterns of language comprehension deficit in abused and neglected children. *Journal of Speech and Hearing Disorders, 53*(3), 239-244.
- Fuller-Thomson, E., & Hooper, S. R. (2015). The Association Between Childhood Physical Abuse and Dyslexia Findings from a Population-Based Study. *Journal of Interpersonal Violence, 30*(9), 1583-1592.
- Haskett, M. E. & Kistner, J. A. (1991). Social interactions and peer perceptions of young physically abused children. *Child Development, 62*, 979-990.
- Hay, E., & Moran, C. (2005). Discourse formulation in children with closed head injury. *American Journal of Speech-Language Pathology, 14*(4), 324-336.
- Hedrick, D. L., Prather, E. M., & Tobin, A. R. (1984). *SICD: Sequenced Inventory of Communication Development*. Seattle, WA: University of Washington Press.
- Hinds, T., Shalaby-Rana, E., Jackson, A. M., & Khademian, Z. (2015). Aspects of Abuse: Abusive Head Trauma. *Current Problems in Pediatric and Adolescent Health Care, 45*(3), 71–79. <http://doi.org/10.1016/j.cppeds.2015.02.002>.
- Holmes, J. (2014). *The search for the secure base: Attachment theory and psychotherapy*. Routledge.
- Hwa-Froelich, D. A. (2012). Childhood maltreatment and communication development. *Perspectives on School-based Issues, 13*(1), 43-54.
- Hyter, Y. D. (2007). Prologue: understanding children who have been affected by maltreatment and prenatal alcohol exposure. *Language, speech, and hearing services in schools, 38*(2), 93-98.

- Johnson, H. (2012). Protecting the most vulnerable from abuse. *The ASHA Leader*, 17(14), 16-19.
- Jones, L., Bellis, M. A., Wood, S., Hughes, K., McCoy, E., Eckley, L., ... & Officer, A. (2012). Prevalence and risk of violence against children with disabilities: A systematic review and meta-analysis of observational studies. *The Lancet*, 380(9845), 899-907.
- Landry, S. H., Swank, P., Stuebing, K., Prasad, M., & Ewing-Cobbs, L. (2004). Social competence in young children with inflicted traumatic brain injury. *Developmental neuropsychology*, 26(3), 707-733.
- Leeper, C. M., Nasr, I., McKenna, C., Berger, R. P., & Gaines, B. A. (2016). Elevated admission international normalized ratio strongly predicts mortality in victims of abusive head trauma. *Journal of trauma and acute care surgery*, 80(5), 711-716.
- Li, L., & Liu, J. (2013). The effect of pediatric traumatic brain injury on behavioral outcomes: a systematic review. *Developmental Medicine & Child Neurology*, 55(1), 37-45.
- Lind, K., Toure, H., Brugel, D., Meyer, P., Laurent-Vannier, A., & Chevignard, M. (2016). Extended follow-up of neurological, cognitive, behavioral and academic outcomes after severe abusive head trauma. *Child Abuse & Neglect*, 51, 358-367.
- Lum, J. A.G., Powell, M., Timms, L., & Snow, P. (2015). A meta-analysis of cross sectional studies investigating language in maltreated children. *Journal of Speech, Language, and Hearing Research*, 58(3), 961-976. [http://doi.org/10.1044/2015\\_JSLHR-L-14-0056](http://doi.org/10.1044/2015_JSLHR-L-14-0056).
- McCauley, R. J., & Swisher, L. (1987). Are Maltreated Children at Risk for Speech or Language Impairment? An Unanswered Question. *Journal of Speech and Hearing Disorders*, 52(3), 301-303. <http://doi.org/10.1044/jshd.5203.301>.
- Maclean, M. J., Sims, S., Bower, C., Leonard, H., Stanley, F. J., & O'Donnell, M. (2017). Maltreatment risk among children with disabilities. *Pediatrics*, 139(4), e20161817.
- Maguire, S. A., Williams, B., Naughton, A. M., Cowley, L. E., Tempest, V., Mann, M. K., Teague, M., & Kemp, A. M. (2015). A systematic review of the emotional, behavioural and cognitive features exhibited by school-aged children experiencing neglect or emotional abuse: Systematic review of school-aged neglect/emotional abuse. *Child: Care, Health and Development*, 41(5), 641-653. <http://doi.org/10.1111/cch.12227>.

- Martin, H. P., Beezley, P., Conway, E. F., & Kempe, C. H. (1974). The development of abused children. *Advances in Pediatrics*, 21, 25-73.
- Merritt, D. H., & Klein, S. (2015). Do early care and education services improve language development for maltreated children? Evidence from a national child welfare sample. *Child Abuse & Neglect*, 39, 185-196.
- Nelson, N. W. (2010). *Language and literacy disorders: Infancy through adolescence*. Allyn & Bacon.
- Oates, R. K., Forrest, D., & Peacock, A. (1984). Self-esteem of abused children. *Child Abuse & Neglect*, 9(2), 159-163.
- Paul, H. A. (2017). Malchiodi, CA, & Crenshaw, DA (Eds.).(2017). What to Do When Children Clam Up in Psychotherapy: Interventions to Facilitate Communication. New York, NY: Guilford Press, 42-61, \$28.00 (paperback).
- Perry, M. A., Doran, L. D., & Wells, E. A. (1983). Developmental and behavioral characteristics of the physically abused child. *Journal of Clinical Child & Adolescent Psychology*, 12(3), 320-324.
- Prasad, M. R., Kramer, L. A., & Ewing-Cobbs, L. (2005). Cognitive and neuroimaging findings in physically abused preschoolers. *Archives of Disease in Childhood*, 90(1), 82-85. doi: [10.1136/adc.2003.045583](https://doi.org/10.1136/adc.2003.045583).
- Robinson, S. (2012). Enabling and Protecting: Proactive approaches to addressing the abuse and neglect of children and young people with disability. *Children with Disability Australia, January*. 25.
- Rogers, S. J., & D'Eugenio, D. B. (1981). Developmental programming for infants and young children (DPIYC): Vol. 2. *Early Intervention Developmental Profile (EIDP)*. Ann Arbor: University of Michigan Press.
- Rogosch, F. A., Dackis, M. N., & Cicchetti, D. (2011). Child maltreatment and allostatic load: Consequences for physical and mental health in children from low-income families. *Development and Psychopathology*, 23, 1107–1124.
- Scarborough, H. S. (1990). Index of productive syntax. *Applied psycholinguistics*, 11(1), 1-22.
- Semel, E. M., Wiig, E. H., & Secord, W. (1996). *Clinical Evaluation of Language Fundamentals (CELF-3)*. San Antonio. The Psychological Corporation.

- Stacks, A., Beeghly, M., Partridge, T., & Dexter, C. (2011). Effects of placement type on the language developmental trajectories of maltreated children from infancy to early childhood. *Child Maltreatment, 16*(4), 287-299.  
<http://dx.doi.org/10.1177/1077559511427957>.
- Stalker, K., & McArthur, K. (2012). Child abuse, child protection and disabled children: A review of recent research. *Child Abuse Review, 21*(1), 24–40.
- Stipanivic, A., Nolin, P., Fortin, G., & Gobeil, M. F. (2008). Comparative study of the cognitive sequelae of school-aged victims of Shaken Baby Syndrome. *Child abuse & neglect, 32*(3), 415-428.
- Sullivan, P. M., & Knutson, J. F. (2000). Maltreatment and disabilities: A population-based epidemiological study. *Child Abuse and Neglect, 24*(10), 1257–1274.
- Sylvestre, A., Bussi eres,  . L., & Bouchard, C. (2016). Language problems among abused and neglected Children: A meta-analytic review. *Child Maltreatment, 21*(1), 47.
- Turkstra, L. S., Politis, A. M., & Forsyth, R. (2015). Cognitive–communication disorders in children with traumatic brain injury. *Developmental Medicine & Child Neurology, 57*(3), 217-222.
- U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children’s Bureau. (2017). Child maltreatment 2015. Retrieved from: <http://www.acf.hhs.gov/programs/cb/research-data-technology/statistics-research/child-maltreatment>.
- U.S. Department of Health and Human Services, Administration for Children and Families, Children’s Bureau. (2010). Child Abuse Prevention and Treatment Act (CAPTA). Retrieved from: <http://www.acf.hhs.gov/sites/default/files/cb/capta2010.pdf>.
- Viezel, K. D., Freer, B. D., Lowell, A., & Castillo, J. A. (2015). Cognitive abilities of maltreated children. *Psychology in the Schools, 52*(1), 92-106.
- Westby, C. E. (2007). Child maltreatment: A global issue. *Language, Speech, and Hearing Services in Schools, 38*(2), 140-148.
- Wiig, E. H., Secord, W., & Semel, E. M. (1992). *Clinical Evaluation of Language Fundamentals–Preschool (CELF-P)*. Chicago: Harcourt, Brace, Jovanovich.

Zimmerman, I. L., Steiner, V. G., Pond, R. E., & Bron, D. E. (1979). *Preschool Language Scale*.  
Columbus: Charles E. Merrill.