

Utilizing the Ecological Integration Model to Understand Parental Abuse of Children with Dyslexia

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Abstract

Fuller-Thomson and Hooper recently found that 35% of adults with dyslexia reported that they had experienced physical abuse as children compared to 7% of adults who did not have dyslexia. Belsky's Ecological Integration Model of Child Abuse which consists of ontogenic development, the microsystem, the exosystem and the macrosystem was used to suggest that there are many factors related to child abuse. The present paper provided an overview of the model and provided data for each component as it relates to child abuse, discusses the nature of dyslexia and how the model could be used to help decrease the likelihood that children with dyslexia will be exposed to parental abuse.

Keywords: Parental abuse; Adolscnent; Dyslexia; Ecological integration model

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Introduction

Unfortunately, physical abuse is common among children who have dyslexia. A recent study [1] discovered that 35% of children with dyslexia, compared to 7.2% of those individuals who did not have dyslexia, reported that they had been physically abused during childhood. This statistic reflects a strange paradox in which parents, who may deeply care and love their children, become frustrated with their children's inability to learn to read which then leads to the potential for physical abuse. Dyslexia is not the only case in which children are likely to be abused. For example, it has been known for some time that there was a link between developmental disabilities and physical abuse [2]. Fuller-Thomson and Hooper's study included a very large sample size of 13,640 respondents from the Community Health Survey in Canada [1].

The present paper will present a conceptual framework regarding physical abuse with individuals who have dyslexia. The Ecological Integration Model of Child Abuse is comprised of four categories; ontogeny, microsystem, exosystem and macrosystem. As an introduction to the model, data associated with the four categories will be presented that outlines the predictive nature of the model for children who were physically abused by parents, but not necessarily children with dyslexia. The model will then be used to present information concerning children with dyslexia and how the model could potentially be used to understand the nature of parental abuse of children with dyslexia.

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The model predicts that physical abuse is much more probable when a parent is frustrated, has little to no information regarding how to solve a particular problem, when the difficulties associated with the problem situation are complicated and severe, and there is little support from others to assist with solving the difficulty. When the dynamics of a family that is dealing with dyslexia are considered, many of the parameters that have been associated with physical abuse are present. The finding that children with dyslexia are more likely to experience physical abuse is consistent with the model.

The Ecological Integration Model of Child Maltreatment

The Ecological Integration Model of Child Maltreatment refers to a model that purports to identify the many variables that are related to child abuse, examining those variables, and synthesizing that information to form a coherent model [3-5]. The goal of models of this sort is to understand the nature of child abuse so that it could potentially be prevented. The Ecological Integration Model considers four categories: ontogenic development, the

microsystem, the exosystem and the macrosystem [4]. A short description of each along with some of the data relevant to those areas will be presented below with regard to what has been learned regarding physical abuse in children and then the data that concerns dyslexia specifically. The integration component of the model simply indicates that each of those areas is important and, when combined, provides a very useful model for understanding child abuse. As is frequently the case explaining behavior, child abuse is complicated. Not one area will be a great predictor of child abuse, but could be very useful in terms of predicting the potential of abuse when combined or integrated.

Ontogenic development

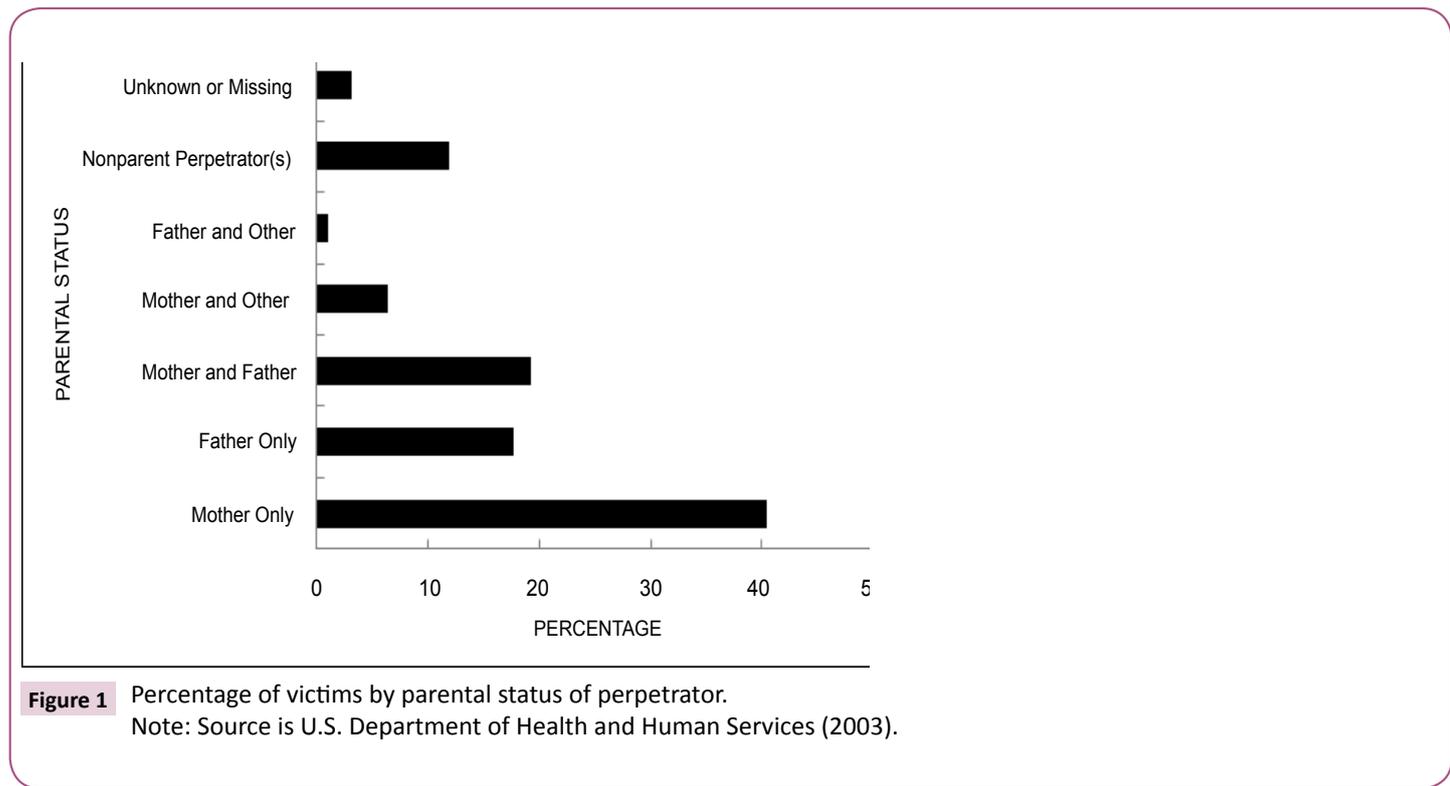
Ontogeny refers to the development of the individual. In the proposed model, this level examines the development of the individual who is perpetrating the abuse: the parent As can be seen in **Figure 1**, the most likely perpetrators of child physical abuse are mothers [6, 7]. This is somewhat different than what would be expected based on media presentations, but is consistent with cultural expectations of which parent is likely to be providing care for children. In the vast majority of households, mothers are responsible for child care. As a result, mothers have much more opportunity to be involved with physical abuse than fathers and, as the model will demonstrate, if the mother has little support from others, particularly the father, frustrations are more likely to occur. Motherhood is very demanding. Early mothers, for example, have expressed that they feel a lack of preparedness, loss, isolation, and exhaustion. For any mother, social support is important, support from not only her partner, but extended family, friends, other mothers and their mothers [8-12].

Many abusers have been found to have a history of maltreatment

in their own childhood. Individuals who were continually abused as children have a higher potential to abuse their own children than individuals without a history of abuse, particularly when their abuse occurred before age 13 for fathers and after age 13 for mothers [6]. However, not all individuals who were abused as children become abusers themselves; the relationship between an abused childhood and committing child abuse is not causative. Parents with a history of child abuse have a higher potential to abuse their own children, but this is neither the strongest nor the only predictor [13]. Estimates of the probability that individuals who were abused as children will abuse as adults have ranged between 25 to 35% [14, 15].

Parents with low levels of formal education have a higher potential to abuse their children [13]. Without explicit instruction, individuals have various levels of knowledge regarding their understanding of development, child care, and parenthood and often use the strategies that their parents used when they were being parented. Even individuals who are well trained and experienced in the care of children, such as foster parents, can experience higher levels of confidence after receiving additional training [16]. It is important to note, too, the need for more empirical examinations of the training programs that are available for parents and parental figures. For example, few programs available to foster care parents, when utilized outside of a wraparound services context, have demonstrated a positive impact on children [17]. Whether or not individuals use good parenting strategies often depends on many factors.

Individuals who abuse as parents have also been found to be grossly ignorant of the timing and sequence of development [18-21]. These individuals simply do not have appropriate expectations of children's behavior [22]. Parents who interact less with their children [21, 23, 24], are stressed due to



developmental difficulties [25], use harsh discipline strategies [26] or overreacting to negative behavior emitted by the child [27] are more likely to engage in child abuse and neglect. When individuals become parents, they often compromise on the different strategies that were learned as a function of witnessing their parents' parent themselves and their sibling(s). So, it is possible that poor parenting strategies can be replaced by better parenting strategies as a function of spousal compromise. Lastly, the absence of child-care experiences has also been found to play a role in abuse [28, 29].

The microsystem

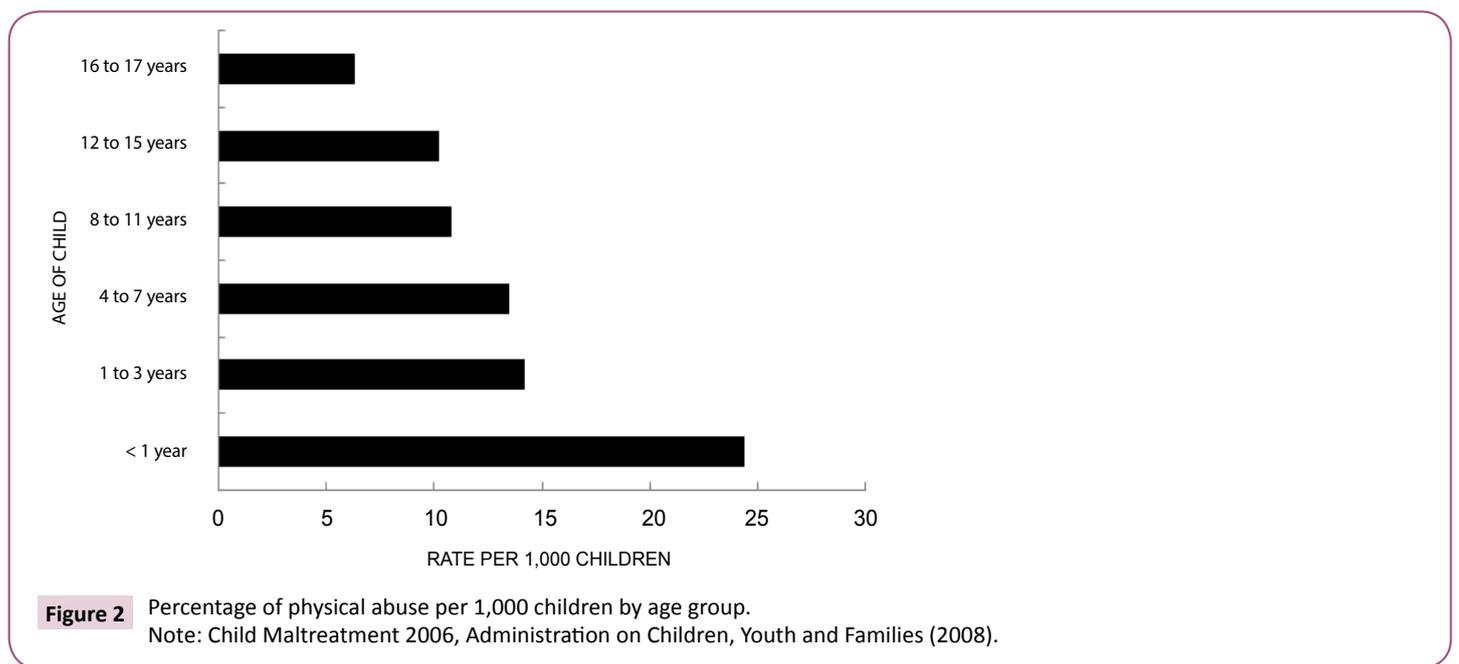
The microsystem refers to a system that is just larger than the individual; the family in which he or she is member. The family is an incredibly important system. It is where children learn how to navigate their environment, are supported in their development, learn values and develop social skills. It is within the context of the family that the individual learns to interact with systems outside of the family. Initially, the individual is supervised within a protected environment, but as the individual develops, he or she requires less supervision and protection of the family and learns more about how those early skills can be used in the other systems.

One of the arguably most repugnant aspects of the microsystem concerns considering the child as a potential contributor to his or her abuse. There are several characteristics of the child that could be considered as variables related to abuse as risk factors. For example, the age of the child is a risk factor. Infancy is the most likely age group for abuse (**Figure 2**). Children with disabilities, including mental health difficulties, were more likely to report experiencing corporal punishment, which they considered to be under the umbrella of child abuse, than children without disabilities [30]. Children with multiple disabilities were more likely than children with only one disability to receive corporal punishment, with children with three or more disabilities being almost 4.5 times

more likely to report receiving corporal punishment than children with no disabilities [30]. Child characteristics are considered within the context of the microsystem level the child affects family dynamics. Child characteristics that are considered risk factors do not relinquish the parents' responsibility with regard to the abuse. However, to fully understand abuse, all potential variables should be considered.

It has been known for quite some time that premature infants or infants with low birthweight are more likely to be abused [31]. Infants who are premature can appear different than full-term infants in appearance, require more intense care and can have different cry patterns which can be more concerning and challenging. In fact, decades-old research has found that children with varying levels of prenatal and perinatal complications have a higher pitch cry that adults, including parents, rated as more sickly, grating, piercing, urgent, arousing, discomforting, aversive, and distressing which can lead to irritation and frustration which is related to a higher probability of abuse [32].

Even at birth, infants have temperaments that vary. Developmentalists [33, 34] have classified these temperaments into three broad categories; easy, slow-to-warm-up, and difficult. The temperaments are essentially personality characteristics that are established early in life and, once established, are relatively stable over a lifetime. The "easy" child is one who is happy and easily comforted. Slow-to-warm-up children are initially somewhat difficult to comfort and are not generally very happy. These children become "easier" as they approach toddlerhood. "Difficult" infants and children are quite challenging to comfort and often not likely to be comforted, are very fussy, and appear to be unhappy. Although developmentalists argue about the appropriateness of categorizing infants and children into these temperaments, many parents have experienced the behaviors associated with the temperaments just described. However, it would appear that infants and children with "difficult" temperaments would be more challenging from a parental



perspective [35] and would, therefore, be more likely to be involved in abuse.

There are fewer interactions in abusive families [23]. Mothers show more negative interactions and fewer positive interactions [36]. Children also tend to avoid the abusive parent, display more negative behavior and parents tend to exaggerate their children's negative behavior [27]. The child's pain and suffering does not inhibit abusive behavior from the parent, most likely because the abuse develops over a relatively long time and escalates slowly. The child comes to anticipate the abusive behavior when the parent becomes frustrated and engages in defensive behaviors such as whining and crying as the tension increases or for older children, avoiding the parent. The parent also is less likely to exhibit empathy toward the child [37].

Mothers who abuse their children are frequently involved in relationships in which there is conflict and violence [38, 39]. These mothers are also more likely to be victims of intimate partner violence [40] which appears to be a very important variable in predicting abuse in children [41, 42].

Marital conflict and discord are also more common in abusive families [43]. Parents who use aggressive tactics to resolve spousal disputes are more likely to use aggressive tactics with their children as well. Abuse is more prevalent in large families (Bae, Solomon & Gelles [44], four or more children) with a risk factor of 1.5 times higher compared to smaller families [45]. Generally though, one child is singled out for the abuse as if he or she were a lightning rod [46]. When tension in the family increases, all members of the family tacitly or actively engage in behaviors that are consistent with abuse including verbal, physical and emotional abuse.

The exosystem

The exosystem refers to the next level of system beyond and external to the family; the neighborhood and work. The neighborhood refers mostly to potential sources of support for the family. The two major types of support with reference to the exosystem involve formal and informal support systems. Formal support systems refer to family members or very close friends. These are individuals who not only provide emotional support for difficult times within families or provide important information to help solve issues. Generally, information concerning particular difficulties that the child is experiencing can help to dissipate parental anxiety thus potentially reducing the likelihood of abuse.

Informal support systems include friends or acquaintances. They also provide support and information just as the formal support network, but in different ways. Parents at parties or other gatherings tend to migrate toward other parents and discuss their children and education. During the discussion, parents might begin discussing topics that are a concern to them. The information that is shared amongst parents can be very helpful in solving some of the issues facing parents. This information is helpful emotionally since the anxiety associated with the difficulty can be dissipated knowing that others have had similar experiences. Additionally, the information might contain helpful solutions that can be used.

In both cases, formal and informal support systems provide emotional and informational support. Having access to formal and informal support systems is not only helpful, but necessary. Many issues facing parents are better solved by sharing the difficulty with others and acquiring knowledge and support in return. Social isolation has been discovered to play a role in child abuse. The lack of social connections within the extended family, families in the neighborhood and communities has been related to child abuse [40, 47, 48]. In addition, child abuse and neglect have been witnessed in families in which there is a lack or very poor social support networks, very poor marital relationships and when those interpersonal relationships are generally short lived [8-12]. For mothers who abuse their children, they report a more negative relationship with their own mothers, do not have very supportive or strong relationships with their mothers and report a lack of emotional support from their mothers [49].

The probability of child abuse has been examined with regard to poverty, large number of children in relation to the number of parents, the change in population of a neighborhood and the concentration of single-parent families [50, 51]. The most important of these factors was the level of poverty with in the neighborhood the family lives and the difficulty associated with child care [52].

The macrosystem

The macro system refers to society and culture's attitudes towards and beliefs about violence, corporal punishment, and children. Sociologists suggest that Western culture is violent. Western cultures value violence at times. Television shows, movies, and video games often depict acts of violence. Viewing violence, even when the violence is known to be not real, increases one's tolerance of violence to some extent. Attitudes concerning violence and corporal punishment have been examined in relation to child abuse [53].

Corporal punishment, spanking, has been a discipline strategy has been used for a great long time. The long-term effect of spanking as a primary discipline strategy has not been effective. Children who have been frequently spanked are more likely to be depressed, aggressive, anxious, have feelings of helplessness are more likely to abuse substances and to be maladjusted [53-55]. The behaviors that led to the parents physically disciplining their children are likely to increase. In cultures that discourage or prohibit corporal punishment, child physical abuse is rare. According to the Global Initiative to End All Corporal Punishment of Children, 42 countries have passed legislation that has banned physical punishment.

Lastly, in many Western cultures parenthood is seen as ownership. There might be disagreement or condemnation of the tactics that some parents use with their children, but failure to intervene when a child is being physically abused occurs frequently. Rather than ownership with regard to children, a better notion of raising children comes from the Igbo and Yoruba proverb "it takes a whole village to raise a child."

Combining the three components of the macrosystem as it relates to physical abuse, acceptance of violence at some level, thinking that parenthood is equivalent with ownership, and using corporal

punishment increase the likelihood of physical abuse. Although stated three decades ago, Belsky's notion that "...despite the fact that advances are being made in the fight for children's rights, it is doubtful that maltreatment can be eliminated so long as parents rear their offspring in a society in which violence is rampant, corporal punishment is condoned as a child-rearing technique, and parenthood itself is construed in terms of ownership" continues to be true [4].

The Ecological Integration Model of Child Abuse presents various aspects that can contribute to child physical abuse. The major point of the model is not to identify a singular cause or variable related to child abuse, but to aggregate the variables to discern risk and to understand how people who had no intention to ever abuse their children become child abusers.

Not all of the variables known to be related to abuse have been discussed above, but it is not difficult to envision how a combination of several variables might lead to hazardous parental behavior [56]. That combination could include several of the following; a gross ignorance of the timing and sequence of development, lack of child care experiences, personal experience of abuse, lack of formal or informal support, employment or spousal tensions, within a culture that condones treating children as if the parent owns them, using corporal punishment and accepts violence. It would not take all of those variables. In fact, [57] empirically examined the potential of using models such as that described above to predict instances of abuse. Papatola's findings suggested that the most powerful predictors of abuse were the mother's perceived quality of care that she received when she was being parented as a child, family continuity and life stress. Family Continuity was a derived factor consisting of variables that loaded strongly from the Family Environment Scale. Those mothers who scored high on this factor "viewed their families as highly supportive and committed to the welfare of the family." Mothers who scored low on this factor "viewed their families as minimally supportive and not very interested in, or committed to the family's welfare (p. 81)." The family's interaction style was that of aggression, hostility and conflict. The model including quality of care the mother received as a child, family continuity and life stress accurately classified 86% (85.87%) of the mothers into either the abusing or not abusing groups. Kotch, Browne, Dufort [58] not only found that social support was related to child abuse, but lower levels of social support were related to abuse even in families where maternal depression and stress were relatively low. Additionally, abuse was more likely in families in which the mother: 1.) was depressed, 2.) had psychosomatic symptoms, 3.) did not graduate from high school, 4.) consumed alcohol, 5.) was involved in public income support, 6.) was caring for more than one dependent child and 7.) was separated from her own mother prior to age 14 years. There appears to be empirical support for examining child abuse with models that integrate information from several sources.

The Ecological Integration Model of Child Abuse in Relation to Dyslexia

Dyslexia

Learning to read is one of the most complex and key behaviors in which humans engage. In large part, academic and later

professional success is dependent upon reading skills. Unfortunately, 15 to 20% of our nation's children experience reading acquisition failure [59, 60].

"Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge" [61].

There is also considerable work indicating a genetic involvement in the etiology of dyslexia (e.g., [62-64]) and brain areas affected by this genetic influence [65, 66].

The Ecological Integration Model of Child Abuse was used above to demonstrate that difficulties such as child abuse could be understood as a function of examining the specific variables associated with the physical abuse of children. Additionally, those variables can be combined as risk factors such that the probability of abuse could potentially be determined.

As has been documented, children with dyslexia are more likely to be physically abused by parents than individuals who do not have dyslexia [1]. It seems that utilizing the Ecological Integration Model of Child Abuse could also be helpful in examining the potentials variables associated with parental physical abuse of children with dyslexia. Although the literature regarding parental abuse and maltreatment is considerable, the literature specifically examining parental abuse and maltreatment of children with dyslexia is sparse.

There is a considerable lack of knowledge regarding dyslexia generally, and parents specifically have insufficient information regarding the nature of dyslexia, how it should be identified and diagnosed, and what can be done to assist children with to improve their reading abilities. Parents and teachers may come to believe that the difficulty is associated with a lack of motivation [67]. Given the genetic component to dyslexia, several generations of families could have experienced dyslexia and as a result, been more likely to experience physical abuse as well.

Cumulative risk models have also been very useful in predicting child abuse potential [68]. In the case of dyslexia, as will be seen below, the Ecological Integration Model as well as cumulative risk models is useful in that the enormous lack of information available to parents potentially increases the risk of frustration and irritation spilling over to abuse. Certainly, Fuller-Thomson and Hooper's data support this contention.

Ontogenic development

As noted above, one of the most important factors associated with to the ontogenic development concerns the finding that individuals who physically abuse their children are grossly ignorant of the timing and sequence of development. In the case of dyslexia, parents lack the requisite knowledge to understand the nature of dyslexia. It has been known for quite some time that parents who has children with learning disabilities which includes

children with dyslexia, feel inadequate to properly parent their children [69, 70]. Although mothers are frequently the first to notice that their children are struggling with reading, often before their children's schools, parents in general lack sufficient knowledge to assist their children to become competent readers. Parents have little understanding or knowledge of dyslexia which includes insufficient knowledge regarding the appropriate development of phonological processing and reading skills. This can be particularly the case when older siblings had no difficulty learning to read and are currently good and avid readers. The parents are now experiencing a child who would appear to be capable of learning to read, but is not able to do so. This child might be very intelligent, creative, and knowledgeable of a great many areas that are of interest to him or her. The child is likely very motivated to learn to read initially. Unfortunately, as a function of dyslexia that results in repeated failures during the reading acquisition process, he or she experiences reading failure. Knowing how vitally important reading is to academic success and then later to the success of the child to be a successful adult, the parent becomes very concerned about his or her child's lack of ability to learn to read.

The parent might decide to spend more time assisting the child to learn to read, but really has no idea concerning the appropriate strategies to deploy. The parent attempts to gain knowledge to understand the nature of the reading difficulty, but finds a considerable amount of conflicting, and at times, very misleading information. Discussing the lack of progress with the son's or daughter's teacher is often not going to be very helpful as teachers are rarely taught the Science of Reading¹ [71-74], need additional training regarding reading instruction [75], and may even believe and be disseminating inaccurate information regarding dyslexia [76]. Parents are now becoming quite frustrated not only with the lack of progress with regard to reading acquisition, but the lack of knowledge and support of the school system and what is becoming the resistance of the child to be willing to engage in the planned homework activities thought to help the child. The child becomes more resistant and the parent becomes more frustrated and insistent. As a result, physical abuse becomes more probable. The parent believes that his or her child is intellectually capable of learning to read and has evidence of adequate memory, knowledge and listening comprehension skills. Knowing these things about the child, the parent might come to believe that the child is simply not motivated or is unwilling to learn to read. Learning to read is a very effortful activity. Since the lack of motivation is not the cause, working on motivation is only going to lead to further parental frustration. As a result, physical abuse

is more likely since the strategies that the parent is employing are ineffective.

The microsystem

As is the case with any physical abuse, families in which a child has dyslexia are likely to have an increased level of frustration. Nearly half (30 to 50%) of children with dyslexia also have ADHD. There is evidence that divorce is more likely when children have ADHD [77]. Dyslexia increases the family's stress.

Children with disabilities are more likely to be abused than children without disabilities [78]. Sullivan and Knutson [79] found that 31% of children with disabilities experienced abuse and neglect compared to 9% of children without disabilities. This finding is quite similar to the results reported by Fuller-Thomson and Hooper [1] who discovered that 35% of children with dyslexia reported that they had been physically abused during childhood compared to 7% of children without dyslexia. Clearly, the lack of sufficient information possessed by parents regarding dyslexia and disabilities in general, increases the likelihood that physical abuse and neglect will occur in families. In addition, parents of children with dyslexia report higher levels of distress than parents of children who do not have dyslexia [80].

The exosystem

Probably the most relevant aspect of the Exosystem concerns the lack of formal and informal support systems. Although there are groups available to assist parents, such as the Decoding Dyslexia state organizations, centers throughout the nation aimed at helping remediate reading difficulties, and countless sites on the Internet regarding dyslexia, parents have to already know that their children have dyslexia in order for them to seek these services. This may not be the case for a great many parents and they may have a weak formal and informal support network regarding their child's dyslexia.

As noted above, teachers at the child's school are very unlikely at the present time to have adequate knowledge regarding dyslexia. The vast majority of colleges of education do not teach the Science of Reading and, as a result, most teachers are ill-prepared to handle disseminating information about reading difficulties and are not going to be a very good source of informal support for parents. This is an extremely unfortunate situation since research has made great gains in the knowledge of dyslexia in terms of identification and interventions. Most teachers not only want to be resources for parents, but more importantly, also want to help their students with dyslexia become competent readers. Colleges of education need to be incentivized to provide course content presenting the Science of Reading along with evaluation and intervention strategies for students with dyslexia. Without this training, teachers are left without a very important component of their knowledge base and therefore, most teachers are not going to be adequate resources for parents despite being the individuals from whom parents are going to seek advice concerning how to best educate their children.

Teachers and other school personnel who lack the requisite knowledge concerning dyslexia, the Science of Reading and other pertinent issues are going to be more damaging than simply a

¹The term Science of Reading refers to the corpus of knowledge that includes what science has determined to be relevant to reading, reading acquisition, assessment of poor reading and the interventions available for poor readers. The Science of Reading involves precisely what science has discovered to be relevant not only to reading, its subskills and reading acquisition, but how to modify experiences such that poor readers can become competent readers. This knowledge includes phonology, phonics, orthography, fluency, vocabulary, comprehension, neuro-processing as it relates to reading and its genetic basis, visual, perceptual and memorial processing, the various writing systems, the alphabetic principle, letter-sound correspondences, among other areas.

poor resource. Some of these teachers and school personnel are likely to blame the child; suggest grade retention, which is argued to be an ineffective strategy; indicate that they have no knowledge of dyslexia, state that they do not evaluate dyslexia or a number of other false ideas. This leaves the parents powerless, desperate and very frustrated. Rather than providing informal support, teachers and other school personnel are likely to increase the desperation and confusion for parents directly leading to more frustration and hopelessness.

The exosystem offers little support to parents with children who have dyslexia. Parents too may struggle with reading issues and if so, will have even more difficulty seeking help, information, and support. While schools, for example, can offer some strategies for preventing child abuse (e.g., [81]), these strategies often do not address dyslexia specifically. The macrosystem has even less to offer with regard to dyslexia. Since these two areas do not provide much if any assistance, the bulk of the problem that must be solved lies within the components of the microsystem.

The macrosystem

The macrosystem involves how society and culture understands and supports individuals and parents with dyslexia. It also examines society's belief systems regarding dyslexia. At this point, society has a very weak understanding of dyslexia if it has one at all. The lack of understanding and the lack of support from exosystems leads parents to seek ineffective "treatment" options wasting valuable resources and time, which only results in further frustration. When these treatments fail, the child is often blamed for not working as diligently as he or she should have.

The macrosystem can also help to put pressure on colleges of education to more adequately prepare future teachers. There are several states that have created "dyslexia laws," so there are attempts to change the macrosystem.

Summary

The Ecological Integration Model of Child Abuse has been useful in understanding the nature of child abuse and maltreatment. It is cumulative in the sense that as the number of risk variables increase, the likelihood of abuse and maltreatment also increases. The model was examined to determine the probability that examining its components would also be useful in understanding the nature of abuse and maltreatment of children with dyslexia.

The four components of the model theoretically contributed to potential risk factors associated with abuse of children with dyslexia. Given the magnitude of the problem and that each of the four areas of the model suggests that parents are provided very little to no support, one would predict that frustrations would eventually become very high. When people become very frustrated such that their coping mechanism is overrun, abuse becomes considerably more likely.

As indicated above, approximately 1 in 3 adults with dyslexia reported being physically abused as children. Physical abuse of children with dyslexia is obviously a serious issue. The Ecological Integration Model helps to provide a framework for understanding why children with dyslexia are at risk for parental

abuse. Examination of the nature of dyslexia and the great ignorance currently surrounding dyslexia with the model portrays a likely scenario of how abuse might be perpetrated by parents. Understanding the elements depicted in the model does not exonerate the parent from the physical abuse which he or she inflicts. However, the model can be used to help decrease the likelihood that parents in the future will physically abuse their children by bringing this information forward. Hopefully, this information will also help provide impetus to help change the systems that are flawed. With regard to the exosystem, it is critical that colleges of education in particular, provide better training to their students regarding dyslexia so that teachers and other school personnel can learn to appropriately identify students with dyslexia as early as possible, determine appropriate interventions for these students, and then to provide appropriate support for families of the children with dyslexia. This change would provide an enormous amount of support for families. Education for the general public, so that society may have at least a rudimentary understanding of what dyslexia is and its symptoms may also be helpful. If this were to occur parents would have access to additional information from the exosystem to provide the type of support that would decrease the probability of the frustration that leads to physical abuse.

Models such as the Ecological Integration Model are very useful in understanding physical abuse and neglect in general and why physical abuse occurs in families in which there are children with dyslexia. The major difficulty across each of the categories of ontogenic development, the microsystem, the exosystem and the macrosystem concerns the abysmal lack of knowledge and information regarding dyslexia. Not only are parents very unfamiliar with the nature of dyslexia including its characteristics, but those that parents rely on to assist their children academically, school personnel, are also abysmally lacking in knowledge. It is imperative that teachers, staff and administrators receive proper education concerning the Science of Reading and that early identification procedures be used. The Science of Reading is not only a corpus of knowledge regarding the nature of reading acquisition, but it also provides considerable information regarding early identification, diagnosis and intervention techniques.

The likelihood of physical abuse of children with dyslexia could be diminished if what is currently known regarding dyslexia and contained within the Science of Reading would be disseminated to parents, teachers, administrators, pediatricians, others who work very closely with children, and the public. The Ecological Integration Model very succinctly identifies the weaknesses and lack of knowledge that contributes to the increased probability of physical abuse of children with dyslexia as reported by Fuller-Thomson and Hooper [1]. It is imperative that the knowledge contained within the Science of Reading be incorporated into preservice teacher training, inservice training, and provided to parents such that a clearer understanding of dyslexia emerges and so that physical abuse of children with dyslexia can be eliminated.

The present paper presented a theoretical framework for understanding the potential for physical abuse of children with dyslexia. Additional empirical research is necessary to examine

its effectiveness, particularly with regard to children with dyslexia who are at risk for experiencing abuse. Future directions may include providing support in the different Ecological Integration Model levels and examining their impact on child abuse and child abuse potential.

At the ontogenic level, providing psychoeducation to parents – that is, potential perpetrators of child abuse – about dyslexia, the implications of reading difficulties, and some frustrations they may experience may help increase their understanding of the situation as well as their child, and decrease their potential for abuse. At the microsystem level, when considering the families of abusers and potential abusers, direct, explicit reading instruction intervention for children with dyslexia may help decrease their reading difficulties and the tensions that stem from these difficulties at home. Implementation of Science of Reading courses in colleges of education can have multiple layers of benefits for children with reading difficulties and is an important step that needs taken. Examining the knowledge provided in these courses and their impact on parents' potential to abuse their children with dyslexia is a potential avenue for future research. The implications of such knowledge can have an impact on the exosystem as well as the macrosystem. Improvements in colleges of education and in society with regard to dyslexia can bolster the formal and informal sources of support for parents of children with reading difficulties.

Limitations

The nature of the present paper was to suggest the usage of the Ecological Integration Model of Child Abuse to assist in determining the etiology of the high rate of parental physical abuse of children with dyslexia. The model provides a promising approach to understanding this phenomenon. However, there are limitations to the usefulness of the model. The most limiting aspect concerns the lack of research specifically examining children with dyslexia and abuse. There is considerable research addressing children with disabilities and abuse, but this is an enormously heterogeneous population. Work needs to be done that specifically examines children with dyslexia. Fuller-Thomson and Hooper's finding that 1 in 3 adults with dyslexia reported

parental abuse when they were children suggests that this is an important area of inquiry.

Conclusion

Fuller-Thomson and Hooper [1] discovered that 35% of adults with dyslexia reported experiencing parental abuse as children. The Ecological Integration Model of Child Abuse was examined as a device to further understand the nature of the abuse of children with dyslexia. Although a paucity of information exists with regard to children with dyslexia and abuse, the literature quite clearly suggests that one of the major difficulties surrounding dyslexia is the lack of knowledge that parents, teachers, and lay people possess with regard to the nature of dyslexia, how it should be identified and how to successfully intervene so that children with dyslexia can become competent readers. Frequently, people who have children who are struggling to read are unaware that their children have dyslexia. The model suggests that the high rates of parental abuse in children with dyslexia results as a function of lack of knowledge. The lack of knowledge concerns parents, teachers who could be providing information to parents and who could be providing interventions for the children with dyslexia, and the general population. As a result, the child with dyslexia is not receiving the types of supports that could help the child become a competent reader. The parents are left with no understanding of how to help their children which increases their frustrations. Teachers who are not trained in the Science of Reading and who have little to no knowledge regarding dyslexia are unable to provide the type of support to parents to dissipate parents' anxieties.

Although the solution to reducing the rate of parental abuse of children with dyslexia is likely to be multifaceted, one of the key elements derived from the model would be to increase the public's awareness of dyslexia, to provide training to teachers that includes the Science of Reading, dyslexia, evaluation systems and interventions, and to engage parents of children with dyslexia to provide them with a working knowledge of dyslexia and what they can do to assist their children. These strategies should lead to a dissipation of the anxieties and frustrations that parent of children with dyslexia experience, thereby reducing the likelihood of physical abuse.

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