

Parenting of children under two: severe physical punishment and psychological aggression

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## ABSTRACT

Adam J. Zolotor: Parenting of children under two: severe physical discipline and psychological aggression (under the direction of Dr. Jonathan B. Kotch)

Severe physical discipline and psychological aggression towards children have well documented consequences and are along spectrum of parenting that can be part of, or lead to, child maltreatment. Some research has focused on the particular vulnerabilities of young children and suggests an even more pressing need to understand and prevent such victimization. To date, there have been few studies with sufficient samples to report on severe physical discipline and psychological aggression towards children under two. This study uses data from the largest reported population-based study of child victimization of children under two. Mothers were surveyed regarding parenting behaviors of themselves and their partners over the previous year using the Parent-Child Conflicts Tactics Scale as a core instrument with project developed items to learn more about shaking as a behavior. Nearly 3000 mothers (n=2946) completed this anonymous telephone survey. Nearly two percent (1.8%) of mothers reported using one or more types of severe physical discipline in the last year. One percent self-reported shaking by themselves or their partner. Of these, 90% reported shaking occurred in the context of anger, frustration, potential harm, or aversive stimulus (i.e., crying). Nearly four times as many mothers reported observing someone else (not self or partner) shake a child under two in the last year. Yelling was endorsed by 39% of

mothers, with 11% reporting frequent yelling ( $\geq 12$  times in the last year). One or more types of severe psychological aggression were reported by 7% of mothers. Increasing child age, use of alcohol or tobacco during pregnancy, and spanking are salient risk factors for reported use of psychological aggression. Psychological aggression was endorsed by nearly two-fifths of mothers of children under two with yelling being a prevalent strategy. Given current understanding of the consequences of psychological aggression, more attention should be paid to this and other forms of psychological aggression. Parent educators and primary care clinicians should discourage this type of negative, coercive, and potentially destructive type of discipline.

## DEDICATION

To my family Karolyn, Anna, and Molly for their constant love, support, and inspiration and to my father Aaron in his most difficult hour.

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## CHAPTER 1: OVERVIEW

Estimates of child maltreatment in the United States range from nearly 800,000 to over 1.2 million children annually.<sup>1,2</sup> These estimates include only those children that are reported to child protective services or known to an adult in the community. However, child maltreatment may be much more common because acts of abuse or neglect may only be known to the child and the caregiver. Anonymous survey research has become an important adjunct tool in the study of child maltreatment. Adolescents may be asked about their own victimization experiences. However, for younger children, caregiver report is the only commonly applied method of learning about child victimization. Estimates of child victimization or surveillance are vital in defining the scope and nature of the problem, resource planning, and ongoing evaluation of policy and programmatic solutions.<sup>3-5</sup>

Children under two represent an important group for the surveillance of child maltreatment. Young children have specific developmental, anatomical, and neurochemical vulnerabilities to such stress. However, due to limitations of sampling, few previous studies have included sufficient numbers of young children to understand at a population level the magnitude of child maltreatment. Overall rates of maltreatment are highest for young children and rates of child abuse related death are also highest among young children.<sup>1</sup> Numerous studies have shown that earlier abuse and neglect has a greater impact on development than later abuse and neglect.<sup>6-9</sup> One longitudinal study of discipline at age three

found that, among girls, physical discipline was associated with a lower IQ.<sup>10</sup> A subsequent study with a much larger sample and more effective control of confounding variables reported that spanking at one year of age was associated with aggressive behavior at two years of age and lower developmental scores at three compared to children that were not spanked.<sup>11</sup> A recent prospective cohort study reported that spanking at three was associated with increased aggressive behavior at five, further reinforcing that the groundwork for adverse developmental and behavioral consequences of spanking may be laid at a young age.<sup>12</sup> The reason for a differential response to stress in early childhood is not well understood. One study of a small group of toddlers demonstrated that physical discipline was associated with high hormonal reactivity to stress and an altered hypothalamic-pituitary-adrenal axis. The authors argue that this may make the child sensitive to later stress, cognitive deficits, and future social-emotional problems.<sup>13</sup> Other studies in both animals and humans have shown a variety of neuro-hormonal associations with such stress.<sup>14</sup>

Many child abuse prevention programs have begun to focus on positive parenting, often using the rubric promoting safe, stable, and nurturing relationships. Harsh physical punishment and psychological discipline are important components of this construct.

### *Abusive Head Trauma*

This study is part of the evaluation plan of a five year abusive head trauma (AHT) prevention program. Abusive head trauma includes any child abuse which results in injury to the head. This encompasses what has been generally known as shaken baby syndrome, but also head injuries not thought to be due to shaking or exclusively due to shaking. Starting in

2008, a research consortium of the University of North Carolina Injury Prevention Research Center, the Center for Child and Family Health, the National Center on Shaken Baby Syndrome, and the University of British Columbia embarked on an effort to implement and rigorously evaluate a statewide prevention program, the largest of its kind. The program being implemented is known as The Period of PURPLE Crying (PURPLE), and is based on understanding normal newborn crying and the finding that this crying, at extremes, is the most common trigger for abusive head trauma.

Previous work done in North Carolina on the epidemiology of abusive head trauma (AHT) and parenting survey research made North Carolina the ideal place for the implementation and evaluation of this program. The epidemiology of AHT prior to prevention efforts has become clearer. In North Carolina, the calculated rate of AHT resulting in intensive care unit admission or death in the first two years of life is 17.0/100,000 child-years with a rate of 29.7 in the first year of life.<sup>15</sup> Risk factors for AHT include being a first child, male, part of a multiple birth, from a military family, or having young parents.<sup>16</sup> Other risk factors include disability, unstable family situations, prematurity of the child, and lower socio-economic status.<sup>15</sup> The outcomes from AHT are grim. Twenty-six percent of NC children died acutely, many without admission to a hospital.<sup>16</sup> Three years after AHT, 47% of the survivors were > 3 S.D. below and 60% were > 1 S.D. below the mean for IQ.<sup>17</sup>

An important piece of baseline data is parent-reported shaking of young children. A previous survey study from 2002 demonstrated 2.6% of parents reported shaking of children under two.<sup>18</sup> This means that 152 children were shaken as a form of discipline by a mother or her partner for every child admitted to a pediatric intensive care unit or dying from abusive head trauma. However, because of the small number of children under two in this study, the

precision of this estimate is limited. Further, little is known about what parents mean when they endorse shaking as one of many items of query regarding discipline on a survey. However, the fact that shaking is more common than abusive head trauma presents an opportunity to study parenting behaviors in a way that has 1) more statistical power, 2) lacks bias introduced by diagnosis and coding, and 3) may provide a window into the study of less severe shaking that is related to behavioral, emotional, and learning disabilities. Shaking children for discipline is up to 10 times more common in developing countries than in the US and is perpetrated at greater rates by mothers.<sup>19</sup>

Crying is normal in *normal* infants, as is inconsolable crying. Crying is the most common trigger for shaking and physical abuse. The importance of crying in normal infants comes from accumulated evidence that the crying properties thought of as “colic” and considered to be a sign of abnormality are actually typical of normally developing infants.<sup>20-</sup>  
<sup>23</sup> Recent studies demonstrate that early crying is the most common stimulus for AHT (and perhaps other forms of infant abuse). Critical to understanding early infant crying is recognition of (1) large variations among infants in amount of crying, with 25% of infants crying more than 3.5 hours/ day and 25% crying less than 1.75 hours at the peak,<sup>24, 25</sup> and (2) a spectrum of crying from a little to a lot, with no “cut-off” between normal and abnormal (“colicky”) amounts.

Parent reported prevalence of endorsing shaking as a method of soothing or discipline represents a significant risk for AHT.<sup>26</sup> Barr et al. examined hospital discharge data collected by the California Health and Human Services Agency.<sup>27</sup> Since 1996, these data have included a specific code for shaken baby syndrome. The data reveal an age-related curve of incident cases that begins at the same time and has a similar shape (increase, peak and

decline) as the curve for normal infant crying. This finding provides indirect evidence that crying is an important stimulus for shaken baby syndrome. Further indirect evidence comes from the Edinburgh series with an identical age-related curve for the incidence of shaken impact syndrome.<sup>28</sup> Lee et al. examined the age-specific incidence of publicly-reported cases of Shaken Baby Syndrome in the victim data base of the National Center on Shaken Baby Syndrome. This study demonstrates that publicly reported cases of AHT both with and without crying as a reported trigger peak at 9-12 weeks of age and are similar to the crying curve.<sup>29</sup> Furthermore, a similar temporal pattern can be demonstrated with other forms of child abuse and neglect resulting in hospitalization peaking in the first five months of life,<sup>30</sup> indicating that crying may be an important stimulus for other types of early child physical abuse.

The PURPLE materials have been tested empirically with 4,400 mothers in Seattle and Vancouver to assess their impact on knowledge and behavior change. Both studies reported increased knowledge about the normality of early infant crying for parents receiving PURPLE materials, and that parents were more likely to share information with other caregivers about the dangers of shaking and the option of walking away from their infant if frustrated.<sup>31, 32</sup> In the Vancouver study, parents also documented increased walking away behavior when frustrated themselves.<sup>32</sup> The Seattle study indicated that the results were similar regardless whether the materials were given in prenatal classes, on maternity wards, or in pediatrician's offices.<sup>31</sup> The North Carolina program has extended the work of these pilot studies by attempting to reinforce the lessons of Purple in doctors office and health departments across the state and with a 1 year targeted media campaign with an emphasis on earned media and radio campaigns in three major media markets.

### *Severe Physical Discipline*

Infant crying may trigger other forms of harsh physical punishment and abuse. For example, abusive fractures are more common in infants than in toddlers.<sup>33</sup> Caregivers who are more sensitive to infant crying have higher child physical abuse risk scores.<sup>34</sup> Men who perceive a high pitched (i.e., noxious) infant cry as urgent are more likely to respond with sensitive care giving, while those who did not perceive the cries as urgent were likely to respond harshly.<sup>35</sup> Though the characteristics of normal infant crying have been most closely studied with AHT, crying may present a window of opportunity to consider the prevention of other types of harsh parenting practices and physical abuse of infants.

Previous population-based studies have examined the rates of severe physical discipline. A large, population-based survey of North and South Carolina mothers demonstrated rates of severe physical discipline of 4.3%, compared to 4.9% from a national survey of parents seven years earlier.<sup>36, 37</sup> With rare exception, these studies have either focused on children 0-18 or on older children, usually by self-report. A recent exception to this was a paper examining the subset of children under two in a nationally representative sample of children. This study used the Juvenile Victimization Questionnaire to categorize infants and toddlers (n=503) as victims of assaults and other types of experienced or witnessed violence. However, the mechanism of assault was not reported and rates of assault were low (mostly 0-2%) for precise estimates in this small sub-sample of young children.

### *Risk Factors*

Risk factors for medically diagnosed AHT include being a first child, a male, a twin, a military family, having young parents, prematurity, and poverty.<sup>15, 16</sup> Other forms of reported and substantiated physical abuse are more common among older children.<sup>2, 38</sup> The Fourth National Incidence Study found that the rate of reported physical abuse among children ages twelve to fourteen was significantly higher than the incidence among children ages zero to two.<sup>2</sup> This may reflect failure to recognize child abuse among the younger children.<sup>2</sup> Children below two years may have less community exposure than older children and be less likely identified as abused by observers. Most studies have defined physical abuse based on reports to child protective services. Official reports far underestimate true abuse and likely introduce bias affecting risk factors.<sup>2, 5, 18</sup> Younger mothers are more likely to be reported for physical abuse than older mothers and to have those reports substantiated.<sup>38, 39</sup> A longitudinal study of 644 families determined that younger mothers were 2.37 times more likely to physically abuse their children as measured by official reports and self-reports.<sup>40</sup> Caregiver single marital status has also been found to be associated with reported and self-reported physical abuse as well as abuse potential.<sup>2, 40, 41</sup> Children who live with only one parent are more likely to be reported for physical abuse than children who live with both parents, to have those reports substantiated, and to have higher abuse potential.<sup>2, 40, 41</sup> Additionally, the NIS-3 determined that children who live with only their fathers are at a marginally higher risk of being physically abused than children who live with only their mothers.<sup>42</sup> The victim's race is sometimes found to be a risk factor for physical abuse with minority race/ethnicity inconsistently found to pose greater risk of officially reported or substantiated abuse as well as self-report.<sup>2, 38, 43, 44</sup>

Physical abuse is more common among older children than younger children.<sup>45, 46</sup> The Fourth National Incidence Study found that the rate of physical abuse among children ages twelve to fourteen was significantly higher than the incidence among children ages zero to two.<sup>42</sup> This may be due to a lack of identification among the younger children.<sup>42</sup> Children ages zero to two have may have less exposure to people in the community than older children and be less likely identified as abused by community sentinels.<sup>42</sup> The association with age has been inconsistent with population-based surveys.<sup>44</sup>

Poverty has been reported to be associated with all types of maltreatment. This has been demonstrated using data from surveys of sentinel providers as well as using data from the Missouri census linked with data from child protective services.<sup>39, 47, 48</sup> In a longitudinal study of children at risk for abuse and neglect, Kotch and colleagues found a strong association between reports for all types of maltreatment and poverty.<sup>49</sup> Poverty has been found to be a significant predictor of experiencing physical abuse.<sup>40-42, 50</sup>

### *Psychological Aggression*

*Psychological aggression* towards children has been previously defined as “communication intended to cause the child psychological pain” whereas *psychological abuse* is considered psychological aggression that results in emotional injury to a child.<sup>51</sup> Psychological aggression and abuse have been reported to have severe psychological consequences,<sup>52-58</sup> yet are studied less than other forms of discipline or maltreatment. In 2009, 52,532 children were reported to social service agencies in the United States for psychological abuse (0.7/1000 children).<sup>38</sup> Reports of psychological abuse appear to under-



estimate the problem and its consequences. According to the fourth National Incidence Study, over 300,000 children (rate of 4.1 per 1000 children) were subject to emotional abuse according to a standard of judgment that the maltreatment endangered the child; about 1/10 of all maltreatment.<sup>2</sup> Self-reported psychological aggression rates by parents are substantially higher. One study, from a national parent sample, reported that 24.3% had used psychological aggression in the past year.<sup>36</sup> A population-based study of North and South Carolina mothers reported psychological aggression at 13%, but definitions somewhat varied between the two studies.<sup>59</sup> In particular, one form of psychological aggression, yelling, was excluded because it was so prevalent to be deemed normal behavior. One study reported rates of yelling in the last year at 74.7%.<sup>60</sup>

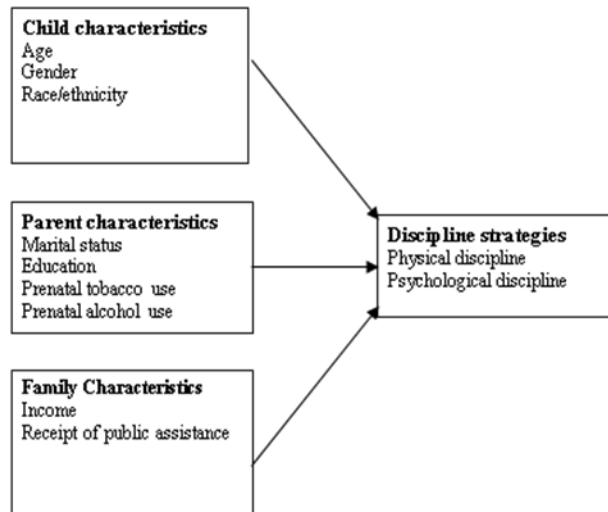
Previous studies examining risk factors for psychological aggression suggest that low socioeconomic status, child age, parental age, and child gender are associated with psychological aggression. However, studies have yielded inconsistent results. These studies have been from small, usually clinical, samples, and have largely not focused on young children. One national study focused on young children, but the only item used to assess psychological aggression was parent yelling.<sup>61</sup> A systematic review from 2003 describes most of the previous studies on psychological aggression and included 11 studies, including 5 clinical samples, and 6 community or population-based samples. Of the community samples, 3 were large (more than 500 subjects). Two of these studies surveyed adults regarding their memories of childhood, and one was an analysis of the 1985 National Family Violence Survey.<sup>60</sup> Psychological aggression is associated with numerous psychological consequences for the victim, including low self-esteem, anxiety, depression, substance abuse, suicidal behavior, and personality disorders.<sup>52, 53, 55-57</sup> Though yelling is a prevalent parenting

practice, it has been associated with increased conduct problems and aggression, and decreased social competence.<sup>54, 58</sup> One adult retrospective study examining aggressive parenting during childhood found that psychological aggression had more deleterious effects than physical aggression on adult psychological outcomes.<sup>62</sup>

### *Risk Factors*

The reported relationship between socioeconomic status and psychological aggression has been inconsistent. Most studies have found that families with lower income use more psychological aggression.<sup>63-67</sup> One study from Hong Kong showed the reverse<sup>68</sup> and a US study showed a trend towards higher income parents reporting more yelling.<sup>61</sup> Studies have also reported contradictory results in the relationship between psychological aggression and parent age<sup>61, 64</sup> as well as child gender.<sup>51, 68</sup> Studies examining the association between child age and psychological aggression have found that increasing child age is a risk factor. That is to say older children are more often the subject of psychological aggression.<sup>60, 61</sup> Maternal alcohol and/or tobacco during pregnancy may be associated with greater risk of perpetrating child maltreatment and psychological aggression towards children. Tobacco and alcohol use, and especially prenatal use, are each associated with increased rates of antisocial traits and maternal depression,<sup>69-71</sup> both of which are associated with increase rates of child maltreatment and psychological aggression.<sup>72-74</sup> See figure 1.1 for a partial model of the etiology of physical and psychological discipline. The figure is limited to those variables examined in the current study. The domains of influence borrow from the ecological models of child development and abuse.<sup>75,</sup>

Figure 1.1 : Relationship between child and family characteristics and types of discipline



There is little known about the epidemiology of severe physical discipline or psychological discipline in a large, representative sample of young children. The unique design of the survey sample described below allowed for the efficient generation of a large, population-based sample of mothers of children under two. For common parenting behaviors such as spanking and yelling, this large sample is unnecessary. However, for more rare parenting behaviors such as shaking and cursing at a child, this study has unique power to examine population-based frequencies and demographic associations that have previously been shown with older children and severe physical discipline and psychological aggression.

The specific aims of this dissertation are as follows: 1) To examine the rates and demographic risk factors in North Carolina of maternal reports of shaking of children under

two as a form of discipline by the mother and her partner. We hypothesize that mothers who are young, poor, poorly educated, and unmarried will be more likely to report shaking young children as a form of discipline. 2) To examine reported anger, potential for harm, and triggers for mother reported shaking as well as rates of mother's observed shaking by another adult of another child under two. We hypothesize that most mothers will report anger or frustration at the time of shaking, potential for harm, and aversive triggers such as crying. Similarly, mother's reports of observed shaking will be associated with observed anger or frustration. 3) To examine the rates and demographic risk factors of mother-reported severe physical discipline of children under two in North Carolina, including shaking, beating, burning, and kicking, by either the mother or her partner. We hypothesize that mothers who are young, poor, poorly educated, and single will be more likely to report harsh physical discipline of children under two. 4) To examine the rates and demographic risk factors of mother reported psychological discipline of children under two in North Carolina including yelling, swearing, threatening, calling names, and kicking out of the house. We hypothesize that mothers who are young, poor, poorly educated, and single will be more likely to report psychological aggression towards children under two. Further, we hypothesize that mothers whose partners are young or poorly educated will report more psychological aggression towards children under two.

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## CHAPTER 2: SEVERE PHYSICAL DISCIPLINE OF CHILDREN UNDER TWO

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*Context:* Previous surveys of severe physical discipline, including shaking, of children under two have been limited by the combination of small sample size and low prevalence. The population-based prevalence of these behaviors is important to understand the impact of preventive interventions.

*Objective:* To determine the rates of reported shaking and other severe physical discipline practices among children less than two, the perceived triggers for shaking and the potential for injury from shaking. To determine the relationship between demographic risk factors and severe physical discipline. Lastly, to determine the rates of observed shaking by other adults and associated anger or frustration.

*Design:* Population-based cross sectional survey of mothers of children less than two in North Carolina.

*Setting:* Anonymous telephone survey

*Subjects:* Mothers of North Carolina children less than two selected from birth certificates and matched on publicly available telephone numbers.

*Main Outcome Measures:* Self reported severe discipline and shaking.

*Results:* 2946 mothers completed the survey (response rate of 54%). Nearly two percent (1.8%) of mothers reported using one or more types of physically abusive discipline in the last year. One percent self-reported shaking by themselves or their partner. Of these, 90% reported shaking occurred in the context of anger, frustration, potential harm, or aversive stimulus (i.e., crying). Nearly four times as many mothers reported observing someone else (not partner) shake a child under two in the last year.

*Conclusions:* In this large, population-based survey of mothers, shaking of very young children is reported at a rate 52 times the rate of abusive head trauma. The triggers of shaking, including crying and perceived frustration suggest possible targets for intervention. Anonymous survey methods may help define the prevalence of maltreatment in young children.

US estimates of annual child maltreatment victims range from nearly 800,000 to over 1.2 million children.<sup>2,38</sup> Child protective services reports indicate that rates of maltreatment and child abuse deaths are highest among young children.<sup>38</sup> These numbers are probably underestimates as they include only children reported to child protective services or known to an adult in the community. In all likelihood, child maltreatment is even more common because some acts of abuse or neglect may only be known to the child and the caregiver. Accurate estimates of child victimization are vital for defining the nature of the problem, resource planning, and ongoing evaluation of policy and programmatic interventions.<sup>3-5</sup> The child's age at the time of physical abuse and severe discipline may modify the developmental and behavioral consequences. Numerous studies have shown that earlier abuse and neglect has a greater impact on development than later abuse and neglect.<sup>7-10</sup> However, due to design limitations, few previous studies have included sufficient numbers of young children to characterize their maltreatment at a population level. Anonymous survey research has become an important tool for obtaining more accurate estimates of child maltreatment rates.<sup>77,78</sup> For younger children, caregiver report is a commonly applied method of learning about child victimization.<sup>18,79,80</sup>

A previous survey from 2002 reported 2.6% of infants under two being shaken by a parent.<sup>18</sup> An earlier national survey reported similar rates.<sup>36</sup> This is 152 times the rate of hospitalization or death from abusive head trauma (AHT).<sup>15</sup> However, because of the small number of children under two in the 2002 survey, the precision of this estimate was limited. Further, little is known about what parents mean when they endorse shaking as one of many items regarding discipline on the Parent Child Conflict Tactics Scale.<sup>36</sup> The observation that parent-reported shaking is much more common than hospitalized or fatal AHT presents an

opportunity to study parenting behaviors with 1) more statistical power, 2) lack of bias introduced by diagnosis or coding, and 3) a window into the study of less severe shaking that is related to behavioral, emotional, and learning disabilities.

Severe acts of discipline (beating, kicking, burning, hitting with an object elsewhere than the buttocks, and shaking children less than two) are considered acts of child physical abuse.<sup>18,36</sup> Previous population-based studies have similarly examined severe physical discipline of parents towards children. With rare exception, population surveys have focused on children 0-18 or on older children. A recent exception to this was a paper examining the subset of children under two in a nationally representative sample of children. This study used the Juvenile Victimization Questionnaire to categorize infants and toddlers as victims of assault or other types of violence. However, the mechanism of the assault was not reported, the sample was small, and the response rate was low.<sup>81</sup>

### *Demographic risk factors*

Risk factors for medically diagnosed AHT include being a first child, a male, a twin, a military family, having young parents, prematurity, and poverty.<sup>15,16</sup> Other forms of reported and substantiated physical abuse are more common among older children.<sup>2,38</sup> The Fourth National Incidence Study found that the rate of reported physical abuse among children ages twelve to fourteen was significantly higher than the incidence among children ages zero to two.<sup>2</sup> This may reflect a lack of identification among the younger children.<sup>2</sup> Children below two years may have less community exposure than older children and be less likely identified as abused by observers. Most studies have defined physical abuse based on



reports to child protective services. Official reports far underestimate true abuse and likely introduce bias affecting risk factors.<sup>2, 5, 18</sup> Younger mothers are more likely to be reported for physical abuse than older mothers and to have those reports substantiated.<sup>38, 39</sup> A longitudinal study of 644 families determined that younger mothers were 2.37 times as likely to physically abuse their children as measured by official reports and self-reports.<sup>40</sup> Caregiver single marital status has also been found to be associated with reported and self-reported physical abuse as well as abuse potential.<sup>2, 40, 41</sup> Children who live with only one parent are more likely to be reported for physical abuse than children who live with both parents, to have those reports substantiated, and to have higher abuse potential.<sup>2, 40, 41</sup> The victim's race is sometimes found to be a risk factor for physical abuse with minority race/ethnicity inconsistently found to pose greater risk of officially reported or substantiated abuse as well as self-report.<sup>2, 38, 43, 44</sup>

There is little known about the epidemiology of parent-reported shaking and other acts of severe physical discipline towards very young children. For common behaviors such as spanking, a large sample is unnecessary. However, for infrequent behaviors, such as shaking, a large sample of mothers of young children is required for reasonable precision. The objective of this study was to describe the epidemiology of shaking and severe physical discipline towards young children. In addition, levels of anger, potential for harm, and triggers of shaking are reported. Lastly, candidate demographic variables are examined for predicted associations with shaking and severe physical discipline.

## **Methods**

### *Study Design and Sampling*

An anonymous telephone survey was administered to a probability sample of North Carolina mothers. The target population consisted of all live births to English or Spanish speaking mothers born in North Carolina between October 1, 2005 and July 31, 2007. The birth range was chosen to maximize the number of children under two and field the survey prior to the implementation of an AHT prevention program. Random selection by the North Carolina State Center for Health Statistics from the universe of birth certificates yielded a total of 38,334 live birth certificates from 230,150 live births. Strata were selected for their potential relationship to child abuse and neglect and included maternal age, education, tobacco use during pregnancy, and alcohol use during pregnancy. Sampling occurred within strata to ensure representative allocation across strata.

Mothers' names and addresses from birth certificates were provided to a survey research firm to back-match names and addresses with publicly available telephone numbers. These numbers were then used as a population of eligible phone numbers for random calling.

### *Eligibility*

To be eligible to participate in the study, a selected birth certificate had to be matched with an active telephone number of a North Carolina household. Birth certificates were chosen from live births between October 1, 2005, and July 31, 2007. These dates were chosen to maximize the sample size of mothers of children under two for the survey given that birth certificate files are not available until three months of age. Birth certificate

identified children were 0-24 months at the time the survey entered the field, and 0-30 months at the completion of the survey. This created an unequal and diminishing proportion of children between 24 and 30 months. On the date of the survey, at least one child under 2.5 years of age needed to reside in the household. In the event that more than one eligible child resided in the household, an index child was selected at random from a household inventory. The mother or legal guardian of the index child had to speak English or Spanish and the interview was conducted in her preferred language. There was no attempt to verify birth certificate matching to minimize the risk of breaching confidentiality.

### *Measures*

Parenting behaviors were assessed using the Parent Child Conflict Tactics Scales (PCCTS).<sup>36</sup> The PCCTS asks parents about positive and negative discipline techniques, including positive and negative reinforcement, corporal punishment, and potentially abusive behaviors. The core questions from the PCCTS were asked about the responding mother's behaviors toward that child and the behavior of her partner toward the index child (two separate questions). The utility of anonymously administered PCCTS to provide estimated rates of severe and socially disapproved forms of discipline has been shown previously.<sup>82</sup> The PCCTS has been widely used,<sup>18, 59, 82, 83</sup> has moderate reliability with the physical assault scale (alpha = 0.55), but poor reliability with severe physical assault (alpha= -0.2).<sup>36</sup> Several studies have shown good construct validity and fair discriminant validity for the PCCTS.<sup>36, 84-86</sup>

Questions regarding *severe physical discipline* included in the survey were: How many times in the past year have you [your husband/partner] shaken [child's name]? In the past year, how many times have you [your husband/partner] hit [child name] elsewhere, not on the buttocks, [him/her] with an object such as a belt, hairbrush, stick, or some other hard object? In the past year, how many times have you [your husband/partner] burned, scalded, or branded [child name]? In the past year, how many times have you [your husband/partner] beat [him/her], that is, hit over and over again with an object or fist? Questions regarding *non-severe physical discipline* included in the survey were: How many times in the past year have you [your husband/partner] hit [child's name] buttocks with an object such as a belt or switch? In the past year, how many times have you [your husband/partner] kicked [child name]? How many times in the past year have you [your husband/partner] spanked [child name] on the buttocks with hand only? In the past year, how many times have you [your husband/partner] pinched [him/her]? In the past year, how many times have you [your husband/partner] slapped [child name] on face or back of the head?

In addition to PCCTS item used to assess shaking, respondents who endorsed their own or a partner's use of shaking were asked to characterize the last episode with the following questions: What was [child's name] doing right before you [your husband/partner] shook [him/her]? Response options included crying, fussing, laughing, smiling, pooping, playing, eating, refusing to eat, making a mess, having a temper tantrum, other (free text response). When you [your husband/partner] shook [child's name] would you say you [your husband/partner] were angry or frustrated? Thinking about when you [your husband/partner] shook your child, did you think you might have hurt [child's name]? Respondents were asked about seeing others shake young children: Have you ever seen someone else shake a

baby, not including yourself or your [husband/partner]? Responses includes yes in the past year, yes, but not in the past year, and no. For those endorsing witnessed shaking, they were asked: Was the person shaking the child angry or frustrated? As part of an evaluation of a statewide AHT prevention program using a pre/post survey design, this was collected as an alternative measure of shaking prevalence.

Demographic information was collected about the respondent and her family, including socioeconomic status indicators, self reported race and ethnicity (using US Census categories), age, partner age, education (in years), partner education (in years), child age (calculated from date of birth and date of survey), and marital status. Child age was converted to months by dividing the number of days by 30.5. Household income was queried in \$20,000 increments using mutually exclusive categories and then recoded into mutually exclusive \$40,000 categories. Three separate questions were asked regarding receipt of public assistance, Medicaid, Temporary Assistance for Needy Families (TANF), and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). These three variables were recoded as a single dichotomous variable such that respondents were codes as receiving one or more types of public assistance or none. Race and ethnicity are included because of their connection to child maltreatment reported in the literature.

### *Data Collection*

The survey was conducted from October 1, 2007, to April 7, 2008. Blaise 4.6 (Statistics, Netherlands), a computer-assisted telephone interview software package was used to conduct the survey. A minimum of 12 call-back attempts were made, including at least

one evening, one weekend, and one daytime call before a number was dropped. Interviews could be scheduled by the subject. Interviewers were trained to consistently administer the survey and to manage reluctance and refusal. The survey was translated into Spanish and independently back-translated for use with Spanish speaking mothers. All respondents were provided phone numbers of parenting resources as part of a routine “debriefing”. The survey was anonymous; and after connection and eligibility determination, phone numbers were purged from the computer system to ensure anonymity. This approach to anonymity mirrored an earlier study that developed this approach in consultation with the North Carolina Attorney General’s Office.<sup>18</sup> This ensures that voluntary participation did not place the subject at risk of being reported to child protective services. This study was approved by the University of North Carolina at Chapel Hill Biomedical Institutional Review Board.

### *Analysis*

Data were weighted to account for the disproportionality in the sample arising from the sampling process. The weighting procedures allow the survey results to best approximate the true frequencies of behaviors of the target population in North Carolina. Variables used in the weighting process included mother’s and father’s education, mother’s age, tobacco or alcohol use during pregnancy, marital status, race/ethnicity of mother, urbanization of county.

All demographic variables and discipline behaviors were reported as weighted frequencies for categorical variables and means with standard deviations for continuous variables. Each parent reported behavior and the derived variables were plotted as

histograms by child age to display in a visual format the proportion of children at each age subjected to the reported parenting behavior.

Triggers for shaking were tallied. A high-risk shaking variable was developed to define the rate of shaking in which mothers report concurrent anger or frustration, potential harm, or aversive child behavior as a trigger for shaking. Other forms of severe physical discipline are examined including beating, kicking, burning, and hitting with an object not on the buttocks. Spanking is reported for comparison. These severe physical discipline variables are examined as dichotomous variables with reference to the index child such that an index child is categorized as receiving the type of discipline in the past year by either the mother or her partner or the child is categorized as not receiving the discipline in the past year. Mother reported observed shaking is reported similarly. Mother and partner reported severe physical discipline were tallied to calculate a total rate of severe physical discipline. This variable is a dichotomous variable in which parents are scored as either reporting one or more of the severe physical discipline behaviors or reporting none. These variables were chosen for inclusion because of their previous identification as the severe physical assault scale of the PCCTS and previous use as a proxy for child abuse.<sup>18, 36</sup> Bivariate survey weighted logistic regression analysis examined whether report of behaviors vary as predicted by maternal race, ethnicity, age, income, and education, and marital status. Lastly, bivariate survey weighted logistic regression was used to examine the association between reported self or partner shaking and reported observation of someone else shaking.

*Response rate*

The target sample size was 3,450 mothers to have sufficient power to describe frequencies of uncommon behaviors with adequate precision. See the figure for a description of sample acquisition and disposition. Response rate was determined using the American Association for Public Opinion Research Standard Definitions.<sup>87</sup> Unknown numbers were adjusted for eligibility to include in the denominator by determining the proportion which, if contacted, should be eligible. This is a conservative approach to the determination of response rates known as response rate option 4 and yielded a response rate of 53.6%. The represents the lower bounds of probably true response rates and is the type most often used in scholarly reports. A least conservative calculation for response rate (AAPOR option 6) yields a response rate of 70.2%.

## **Results**

### *Subject Characteristics*

Table 1 reports both unweighted and weighted maternal and family characteristics for the 2946 maternal respondents. More than 99% of respondents were the biological mothers of the index child. The majority of mothers surveyed were between 21 and 35 years old (75.3%), married (81.6%), and white (62.4%). Nearly half of mothers (48%) surveyed were college graduates. Nearly one third of respondents reported household incomes of \$40,001-\$80,000 (31.6%), 26.3% reported incomes of more than \$80,000, and 42.1% reported household incomes less than \$40,001. Self-reported smoking and alcohol drinking during pregnancy were reported by 9.5% and 4.4% of subjects respectively. The index children were between 3 and 29 months of age with roughly equal numbers of boys and girls. There were



no children under three months and approximately 5% of the children were over 24 months but all under 29 months due to the sampling procedure and inclusion criteria. Children were roughly equally distributed from four to 24 months, with fewer children in the three to four month age range due to the delay in finalizing the birth certificate data file.

Rates of reported physical discipline are summarized in Table 2. Discipline was separated into moderate and severe, with strategies typical for older children labeled as moderate discipline. Unlike other types of physical discipline, spanking was common for children under two (31.6%). Rates for other types of moderate physical discipline included: spanking with an object on the buttocks (3%), pinching (2.1%), and slapping on face (0.5%). Severe physical discipline was rare; only 1 or 2 respondents reporting beating, burning, or kicking (rates of less than 0.1%). Hitting with an object elsewhere than on the buttocks was reported by 0.8% of subjects and shaking by 1.0%. Total severe physical discipline by the mother or her partner was reported by 1.8% of respondents. No child received more than one type of severe discipline in this sample.

When a mother reported shaking by herself or her partner, she was asked a series of questions to assess anger, potential for harm, and triggers with reference to the last event (see Table 3). Of the 37 shaking events (29 children with eight children shaken by mother and her partner), 21 were by the mother and 16 were by the father. Most shaking (90%) was accompanied by frustration, potential for harm, or an aversive trigger. The triggers and frequencies listed in Table 4 were largely aversive behaviors. Nearly four times as many subjects (3.7%) reporting seeing someone else (not partner) shake an unspecified child under two years old. Over 10% (10.4%) reported ever seeing someone else shake a child under two but not in the last year. When observing someone else shake, mothers report rates of

perceived anger or frustration at 94% in contrast to 76% for themselves when shaking and 44% for their partners when shaking.

Bivariate associations with physical discipline (not severe) techniques are reported in Table 5 and with severe physical discipline techniques in Table 6. The most consistent association with the use of physical discipline was older child age. As an example, every month increase in child age was associated with a 10% increase in the odds of reported use of an object other than on the buttocks (OR 1.10, 95% CI 1.02-1.19). See the appendix for histogram of the reported use of each physical discipline behavior by child age (Figures 5.1-5.7). Other associations with physical discipline use included lower income or the receipt of public assistance; income less than \$40,001 relative to greater than \$80,000 was associated with use of an object on the buttocks and (OR 2.66, 95% CI 1.31-5.42). Spanking was similarly associated with low income (public assistance OR 2.34, 95% CI 1.34-4.07; middle income \$40,001-\$80,000 OR 1.32, 95% CI 1.06-1.65 relative to income >\$80,000). Non-Hispanic blacks, Hispanics, and other minorities were all more likely to report use of an object on the buttocks relative to non-Hispanic whites (OR 4.24, 95% CI 2.23-8.03; OR 2.38 95% CI 1.02-5.52; OR 3.28, 95% CI 1.21-8.89 respectively).

Unlike physical discipline, shaking was not associated with increasing child age. The receipt of public assistance was associated with nearly four times the odds of reporting having witnessed someone else shake a young child (OR 3.76, 95% CI 2.11-6.70), and income less than \$40,001 was associated with twice the odds of the same (OR 2.29, 95% CI 1.22-4.28 compared to income >\$80,000). Those reporting Hispanic background were more likely to report shaking (OR 6.88 95% CI 2.76-17.18). Mothers of African-American or Hispanic heritage were more likely to report observed shaking (OR 4.08, 95% CI 1.98-8.41;

OR 8.31, 95% CI 4.28-16.10 respectively). Mothers who reported observing someone else shake were at four times the odds of reporting that or their partner has shaken the index child (OR 3.89, 95% CI 1.08-14.01).

## **Discussion**

This study reports population-based rates of physical discipline techniques in a large sample of children less than two years of age. Rates of self reported severe physical discipline are lower than in a previous study in North and South Carolina.<sup>18</sup> These rates are also quite a bit higher than reported physical abuse of young children or rates of AHT for children under two.<sup>16, 38</sup> The rates of self-reported moderate or severe physical discipline, with the exception of spanking, were low. Most forms of physical discipline increased in frequency as children aged. The exception to this was shaking, which has a consistently reported association with crying, a developmental phenomenon that peaks at 2-3 months of age, near the peak of abusive head trauma.<sup>27, 88</sup> All types of physical discipline except spanking were reported by fewer than 3% of subjects, and beating, burning, and kicking were reported by fewer than 0.1% of subjects. Only one other population-based study examined victimization of children under two, albeit with differences in measurement, base population (US versus NC), lower response rate (43%), and less precision due to smaller sample (n=503). This earlier study reported a physical abuse rate of 0.6% (95% CI -0.1-1.3%).<sup>81</sup> This compares to 1.8% in the current study. The current study reports with greater specificity at types of physical victimization, such as shaking, which may be relevant to specific approaches to prevention.

A previous NC population-based study (data collected in 2002) reported a shaking rate of 2.6% or 152 times the rate of severe AHT in NC as reported in a prospective study of pediatric intensive care units and the medical examiners office.<sup>18</sup> An earlier national study reported shaking of children under two at a rate of 2.4%.<sup>36</sup> In this study, we found reported shaking to occur at 1.0% or 58 times the rate of severe AHT as measured by prospective surveillance in pediatric intensive care units and medical examiner cases in 2000 and 2001.<sup>16</sup> Despite the lack of literature on the consequences of reported shaking not brought to medical attention; the emerging literature on mild traumatic brain injury and the vulnerability of the infant brain suggest possible detrimental consequences. There are at least three potential explanations for this apparent decline in reported shaking. First, the earlier estimate derives from a small sample of mothers of children less than two yielding an imprecise estimate (2.6%, 95% CI 0%-6%). Second, ongoing abusive head trauma prevention efforts may be leading to a decline. A 2005 study reported a 47% reduction in abusive head trauma following implementation of a statewide program.<sup>89</sup> Since that time, there has been wide spread adoption of abusive head trauma prevention efforts. In NC, 60% of hospitals report abusive head trauma prevention efforts.<sup>90</sup> Third, prevention efforts may have increased parents' knowledge of the dangers of shaking which could have led to greater under-reporting due to social desirability bias.

The characteristics of the reported shaking warrant close consideration. When parents admit to shaking an infant or toddler in the context of discipline and conflict resolution, might they mean simple jostling, patting, or bouncing? In order to better understand the meaning of reported shaking, we asked about parents' emotional status associated with shaking. Of the reported self or partner shakings, 90% of subjects endorsed

anger or frustration, potential for harm, or an aversive trigger, most commonly crying. The other 10% endorsed none of these characteristics and even reported triggers such as playing and smiling. This could indicate that it was the parent's own emotional state, and not the infant behavior, that served as the 'trigger'. This could also indicate that the true rate of shaking as a potentially abusive act among those who reported shaking (or partner shaking) is 0.9%. While possible, we expect that social desirability biases results toward a lower estimate, even in the context promised anonymity. Our approach to managing this bias was to ask parents about observing someone else shaking a young child, an item endorsed at nearly four times the rate of self or partner-reported shaking and accompanied by much higher rates of anger or frustration. Clearly we cannot determine who of these subjects were really reporting, more honestly in this once removed scenario, about their own behavior. Shaking, especially in anger or frustration, seems unlikely to be done publicly. To assess the relationship between observed shaking and self/partner reported shaking, we used a logistic regression analysis and found that mothers who reported observed shaking were at nearly four times the odds of reporting self or partner shaking. This reinforces the notion that these mothers might be referring to their own behavior. It is also possible that social learning has led them to the use of this behavior or that mothers with risk factors for shaking tend to have others in their social network with similar risk factors.

There were limitations to this study. As a survey of North Carolina mothers, the results may not represent mothers from other areas. We did not directly query spouses or partners of respondents. Our phone survey included very few cell phone users, potentially limiting the generalizability of our conclusions among cell-phone only users. As a cross-sectional study, causality cannot be inferred. We focus on a large number of bivariate

associations, therefore increasing the risk of identifying an association when a true association does not exist. In many cases, the associations are consistent with extant literature and stated hypothesis. However, it is also likely that some associations are due to chance or a Type 1 error. By opting to focus on uncommon parenting behaviors, we sacrifice analytic power that is only partially overcome by a larger sample size. For this reason, we chose to limit analysis to bivariate associations. Recall bias may limit subjects' ability to accurately report behaviors over the past year, thus underestimating the true rates of reported behaviors. Self-reported disciplinary practices may underestimate true prevalence due to potential social stigma, even in an anonymous survey. Finally, we asked respondents to report on potential for harm from shaking. We do not expect parents to accurately estimate harm from a given behavior, but regard this more as a marker of coercion or violence. Strengths of this study include the fact that this is the largest study of parenting behaviors of very young children. The study is population-based and generalizable to a large and diverse state and based on anonymous self-report of parenting behaviors.

The findings of this study will be helpful in understanding the parent behavior of shaking as a potentially preventable risk for abusive head trauma as well as other severe physical punishments towards young children. This understanding of the context for parental shaking and severe physical discipline may inform more effective preventive interventions. Furthermore, this work is a critical step in understanding the frequency of shaking that does not result in severe injury or medical attention. These children may be subject to more subtle behavioral and developmental deficits that may have tremendous downstream cost and consequence.



Figure 2.1: Sample acquisition and disposition

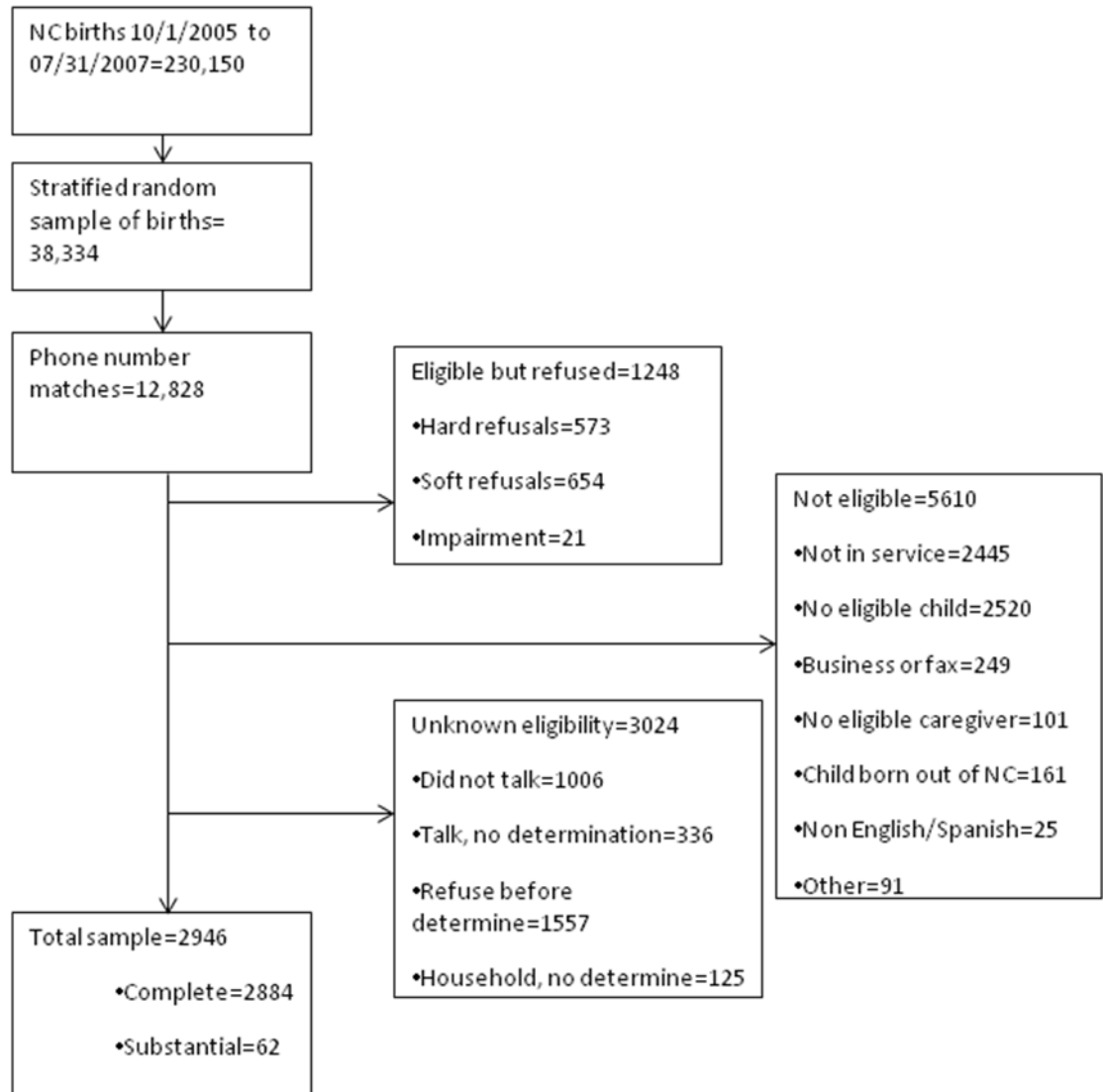




Table 2.1: Sample description of mothers of children 0-2 responding to a statewide survey on child discipline (N = 2946)

<b>Characteristic</b>	<b>Unweighted Percent or Mean (Standard Deviation)</b>	<b>Weighted Percent or Mean (Standard Error)</b>
Age of child, months	14.4 (6.37)	14.5 (0.15)
Sex of child		
Male	52.0	51.8
Female	48.0	48.3
Mother's Age	29.7 (5.75)	28.2 (0.09)
Father's Age	32.4 (6.30)	31.4 (0.13)
Mother's Education	14.2 (2.78)	13.3 (0.05)
Father's Education	14.01 (2.82)	13.22 (0.06)
Marital status		
Married	81.6	60.6
Single	18.4	39.4
Ethnicity/race (mutually exclusive categories)		

African American / Black	12.3	19.9
Asian / Pacific Islander	2.2	1.5
Hispanic	10.5	15.2
White / Caucasian	74.2	62.4
Native American / Indian	0.7	0.9
Other	0.1	0.6
Annual household income		
Less than \$40,001	29.0	42.1
40,001 – 80,000	35.4	31.6
80,001+	35.6	26.3
Receipt of Public Assistance (yes)	35.7	51.8
Tobacco during pregnancy	6.4	9.5
Alcohol during pregnancy	5.7	4.4
Spank last year	30.4	31.6

Table 2.2: Parent report of physical discipline towards children 0-2

Method	Percent	95% CI	Number reporting
<i>Non-severe</i>			
Spank	31.6%	29.6-33.6%	881
Hit with object (buttocks)	3.0%	2.2%-3.9%	67
Pinch	2.1%	1.5%-2.8%	59
Slap face	0.5%	0.3%-0.9%	15
<i>Severe</i>			
Beat	0.03%	0.0%-0.2%	1
Burn	0.05%	0.0%-0.2%	2
Kick	0.02%	0.0%-0.1%	1
Object not on buttocks	0.8%	0.5%-1.2%	23
Shake	1.0%	0.6%-1.5%	29
Any severe	1.8%	1.4%-2.5%	56
Observed other shaking	3.7%	2.8%-4.7%	73

Table 2.3: Parent reported characteristics of shaking children 0-2

Characteristic	Percent	Number reporting
Total shaking	1.0%	29
Self report	0.7%	21
Anger/frustration	0.5%	16
Potential for harm	0.1%	2
Aversive stimulus	0.6%	17
Self report high risk shaking	0.6%	19
Partner report	0.6%	16
Anger/frustration	0.2%	7
Potential for harm	0.1%	2
Aversive stimulus	0.4%	13
Partner report high risk shaking	0.4%	13
Total high risk shaking*	0.9%	25

\*High risk shaking includes all reported shaking with some acknowledged potential for harm, anger or frustration, or aversive trigger such as crying.

Table 2.4: Shaking triggers reported by mothers of children 0-2 in North Carolina (n in parenthesis)

- **Crying (8)**
- **Tantrum (8)**
- **Getting into trouble (5)**
- **Fussing (4)**
- Playing (3)
- Smiling (2)
- Eating (1)
- **Making a mess (1)**
- **Fighting (1)**
- **Getting attention (1)**
- **Screaming (colic) (1)**
- **Would not let change diaper (1)**

\*Items in bold indicate potentially aversive stimulus for shaking

Table 2.5: Bivariate associations with types of non-severe physical discipline (survey weighted logistic regression)

	Spank		Object buttocks		Pinch		Slap face	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Father age	<b>0.97</b>	<b>0.95-0.98</b>	1.02	0.97-1.07	1.00	0.95-1.06	1.00	0.91-1.15
Mother age	<b>0.97</b>	<b>0.95-0.98</b>	0.97	0.93-1.02	0.99	0.95-1.03	0.99	0.88-1.12
Father education	0.99	0.96-1.02	<b>0.86</b>	<b>0.77-0.95</b>	0.98	0.87-1.10	0.98	0.87-1.10
Mother education	1.01	0.98-1.04	<b>0.90</b>	<b>0.83-0.97</b>	0.99	0.89-1.13	0.92	0.81-1.05
Not married (married ref)	0.97	0.78-1.20	<b>2.08</b>	<b>1.19-3.61</b>	0.89	0.42-1.88	0.68	0.15-3.14
Child age (mos)	<b>1.18</b>	<b>1.15-1.20</b>	<b>1.15</b>	<b>1.11-1.21</b>	1.16	1.10-1.22	<b>1.10</b>	<b>1.04-1.16</b>
Child gender (boy ref)	<b>0.82</b>	<b>0.68-0.98</b>	0.67	0.37-1.19	<b>0.49</b>	<b>0.25-0.94</b>	0.56	0.18-1.73
Public assistance	1.03	0.86-1.24	<b>2.34</b>	<b>1.35-4.07</b>	1.24	0.67-2.27	1.78	0.59-5.37
Tobacco during pregnancy	1.22	0.85-1.75	0.76	0.20-2.87	2.21	0.77-5.53	1.23	0.26-5.71
Alcohol during pregnancy	1.10	0.73-1.66	0.76	0.16-3.57	1.66	0.47-5.88	**	
Income (>\$80,000 ref)								
Low (≤\$40,000)	1.07	0.85-1.36	<b>2.66</b>	<b>1.31-5.42</b>	1.55	0.74-3.26	3.32	0.72-15.21

Middle \$40,001-\$80,000	<b>1.32</b>	<b>1.06-1.65</b>	1.50	0.70-3.23	1.54	0.77-3.07	2.72	0.63-11.78
Race/ethnicity (white, non-Hispanic ref)								
Black	0.82	0.62-1.10	<b>4.24</b>	<b>2.23-8.03</b>	1.62	0.72-3.66	0.83	0.20-3.44
Hispanic	<b>0.66</b>	<b>0.48-0.91</b>	<b>2.38</b>	<b>1.02-5.52</b>	0.88	0.31-2.49	1.79	0.32-9.91
Other	0.71	0.42-1.23	<b>3.28</b>	<b>1.21-8.89</b>	1.36	0.30-6.24	2.35	0.29-19.07

\*Bold indicates statistical significance  $p < 0.05$

\*\* Indicates cell size too small for logistic regression

Table 2.6: Bivariate associations with types of severe physical discipline (survey weighted logistic regression)

	Shake		Object elsewhere		Severe total		Observed shaking	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	CI
Father age	0.95	0.90-1.03	<b>1.08</b>	<b>1.01-1.14</b>	1.01	0.96-1.07	0.99	0.95-1.04
Mother age	1.01	0.93-1.09	<b>1.08</b>	<b>1.01-1.16</b>	1.04	0.98-1.10	0.97	0.93-1.01
Father education	0.93	0.80-1.10	1.11	0.97-1.28	1.01	0.88-1.15	<b>0.87</b>	<b>0.82-0.92</b>
Mother education	0.97	0.81-1.15	<b>1.24</b>	<b>1.02-1.51</b>	1.07	0.92-1.24	<b>0.86</b>	<b>0.80-0.92</b>
Not married (married ref)	1.04	0.39-2.81	0.43	0.43-1.86	0.71	0.32-1.56	<b>2.42</b>	<b>1.45-4.03</b>
Child age (mos)	1.01	0.95-1.07	<b>1.10</b>	<b>1.02-1.19</b>	<b>1.05</b>	<b>1.00-1.10</b>	<b>1.05</b>	<b>1.00-1.09</b>
Child gender (boy ref)	1.40	0.58-3.38	1.13	0.07-18-21	1.33	0.72-2.48	0.95	0.55-1.63
Public assistance	1.22	0.52-2.86	0.61	0.23-1.61	0.96	0.48-1.70	<b>3.76</b>	<b>2.11-6.70</b>
Tobacco during pregnancy	0.90	0.19-4.12	1.56	0.31-7.82	1.10	0.36-3.40	0.47	0.13-1.67
Alcohol during pregnancy	<b>3.84</b>	<b>1.35-10.95</b>	1.78	0.40-7.83	<b>2.77</b>	<b>1.18-6.47</b>	1.23	0.37-4.03
Income (>\$80,000 ref)								
Low ( $\leq$ \$40,000)	1.37	0.53-3.52	1.28	0.38-4.28	1.23	0.60-2.55	<b>2.29</b>	<b>1.22-4.28</b>
Middle \$40,001-\$80,000	0.58	0.21-1.57	2.12	0.71-6.34	1.07	0.53-2.14	0.66	0.29-1.49



Race/ethnicity (white non-Hispanic ref)								
Black	1.23	0.34-4.48	1.22	0.37-3.97	1.31	0.57-3.02	<b>4.08</b>	<b>1.98-8.41</b>
Hispanic	6.88	2.76-17.18	0.27	0.03-2.06	<b>2.78</b>	<b>1.28-6.07</b>	<b>8.31</b>	<b>4.28-16.10</b>
Other	2.21	0.28-17.21	**		1.54	0.36-6.62	3.08	0.86-10.99

\*Bold indicates statistical significance  $p < 0.05$

\*\* Indicates cell size too small for logistic regression

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CHAPTER 3: PSYCHOLOGICAL AGGRESSION TOWARD  
CHILDREN ZERO TO TWO

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Objective: To examine the epidemiology of self reported psychological aggression as a form of discipline towards young children and to examine the relationship between parent and family characteristics and the use of spanking as risk factors for psychological aggression.

Subjects: Randomly selected mothers of children less than two, identified from North Carolina birth certificates, with publicly available telephone numbers.

Methods: We conducted a population-based cross sectional anonymous telephone survey of mothers of children less than two using the Parent--Child Conflict Tactic Scales.

Results: Yelling was endorsed by 39% of mothers, with 11% reporting frequent yelling ( $\geq 12$  times in the last year). One or more types of severe psychological aggression were reported by 7% of mothers. Increasing child age, use of alcohol or tobacco during pregnancy, and spanking are salient risk factors for reported use of psychological aggression.

Conclusion: Psychological aggression is was endorsed by nearly two-fifths of mothers of children under two with yelling being a prevalent strategy. Given current understanding of the consequences of psychological abuse and aggression, more attention should be paid to this and other forms of psychological aggression. Parent educators and primary care clinicians should discourage this type of negative, coercive, and potentially destructive type of discipline.

## Introduction

Psychological aggression and abuse have been shown to have severe psychological consequences,<sup>52-58</sup> yet are studied less than other forms of discipline or maltreatment. In 2009, 52,532 children were reported to social services in the United States for psychological abuse (0.7/1000 children).<sup>38</sup> Reports of psychological abuse appear to under-estimate the problem and its consequences. According to the fourth National Incidence Study, over 300,000 children (rate of 4.1 per 1000 children) were subject to emotional abuse according to a standard of judgment that the maltreatment endangered the child, about 1/10 of all maltreatment.<sup>2</sup> Self-reported rates of psychological aggression by parents are substantially higher. One study, from a national parent sample, reported that 24.3% had used psychological aggression in the past year.<sup>36</sup> A population-based study of North and South Carolina mothers reported psychological aggression at 13%, but definitions somewhat varied between the two studies.<sup>59</sup> In particular, one form of psychological aggression (yelling), was excluded because it was so prevalent to be deemed normal behavior. One study reported rates of yelling in the last year at 74.7%.<sup>60</sup>

*Psychological aggression* towards children has been previously defined as “communication intended to cause the child psychological pain” whereas *psychological abuse* is considered psychological aggression that results in emotional injury to a child.<sup>51</sup> Previous studies examining risk factors for psychological aggression suggest that low socioeconomic status, child age, parental age, and child gender are associated with psychological aggression. However, studies have yielded inconsistent results. These studies have been from small, usually clinical, samples, and have largely not focused on young

children. One study focused on children zero to three using a nationally representative sample, but the only item used to assess psychological aggression was parent yelling.<sup>61</sup> A systematic review from 2003 describes most of the previous studies on psychological aggression and included 11 studies, including 5 clinical samples, and 6 community-based or population-based samples. Of the community samples, 3 were reasonably large (more than 500 subjects). Two of these studies surveyed adults regarding their memories of childhood, and one was an analysis of the 1985 National Family Violence Survey.<sup>60</sup> The reported relationship between socioeconomic status and psychological aggression has been inconsistent. Most studies have found that families with lower income use more psychological aggression.<sup>63-67</sup> One study from Hong Kong showed the reverse<sup>68</sup> and a US study showed a trend towards higher income parents reporting more yelling.<sup>61</sup> Studies have also reported contradictory results in the relationship between psychological aggression and parent age<sup>61, 64</sup> as well as child gender.<sup>51, 68</sup> Studies examining the association between child age and psychological aggression have found that increasing child age is a risk factor. That is to say older children are more often the subject of psychological aggression.<sup>60, 61</sup> Maternal alcohol and tobacco during pregnancy may be associated with greater risk of perpetrating child maltreatment and psychological aggression towards children. Tobacco and alcohol use, and especially prenatal use, are associated with increased rates of antisocial traits and maternal depression,<sup>69-71</sup> both of which are associated with increase rates of child maltreatment and psychological aggression.<sup>72-74</sup>

Psychological abuse is associated with numerous psychological consequences for the victim, including low self-esteem, anxiety, depression, substance abuse, suicidal behavior, and personality disorders.<sup>52, 53, 55-57</sup> Though yelling is a prevalent parenting practice, it has



been associated with increased conduct problems, increased aggression, and decreased social competence in children.<sup>54, 58</sup> One adult retrospective study examining aggressive parenting during childhood found that psychological aggression had more deleterious effects than did physical aggression on adult psychological outcomes.<sup>62</sup>

A more detailed understanding of psychological aggression towards young children may be particularly important with regards to both prevention and consequences. Numerous studies have shown that earlier abuse and neglect has a greater impact on development than later abuse and neglect.<sup>7-9</sup> Even if psychological aggression is more common towards older children, it may be more developmentally important for young children. Young children have specific developmental, anatomical, and neurochemical vulnerabilities to such stress.<sup>13, 14</sup> Overall rates of substantiated maltreatment are highest for young children.<sup>1</sup> Most parenting programs target the parents of young children. An improved understanding of the epidemiology, causes, and consequences of psychological aggression towards young children may impact the refinement and development of parenting programs.

The purpose of this study is to describe the epidemiology of psychological aggression toward children zero to two in a large, population-based sample. Psychological aggression includes yelling, frequent yelling, and other types of psychological aggression such as cursing, abandoning, and refusing to speak to a child. In addition, we will examine the relationship between psychological aggression and previously reported risk factors for psychological aggression and maltreatment among older children, including income, education, parent age, child age, minority race/ethnicity, single parenthood, and the use of alcohol and tobacco during pregnancy. We hypothesize that mothers who are young, poor, poorly educated, and single will be more likely to report psychological aggression towards

children under two. Further, we hypothesize that mothers whose partners are young or poorly educated will report more psychological aggression towards children under two. Finally, we will examine the relationship between spanking and psychological aggression.

## **Methods**

### *Study Design and Sampling*

An anonymous telephone survey was administered to a probability sample of North Carolina mothers. The target population consisted of all live births to English or Spanish speaking mothers born in North Carolina between October 1, 2005, and July 31, 2007. The birth range was chosen to maximize the number of children under two and field the survey prior to the implementation of an AHT prevention program. Random selection by the North Carolina State Center for Health Statistics from the universe of birth certificates yielded a total of 38,334 live birth certificates from 230,150 live births. Strata were selected for their potential relationship to child abuse and neglect and included maternal age, education, tobacco use during pregnancy, and alcohol use during pregnancy. Sampling occurred within strata to ensure representative allocation across strata.

Mothers' names and addresses from birth certificates were provided to a survey research firm to back-match names and addresses with publicly available telephone numbers. These numbers were then used as a population of eligible phone numbers for random calling.

### *Eligibility*

To be eligible to participate in the study, a selected birth certificate had to be matched with an active telephone number of a North Carolina household. Birth certificates were chosen from live births between October 1, 2005, and July 31, 2007. These dates were chosen to maximize the sample size of mothers of children under two for the survey given that birth certificate files are not available until three months of age. Birth certificate identified children were 0-24 months at the time the survey entered the field, and 0-30 months at the completion of the survey. This created an unequal and diminishing proportion of children between 24 and 30 months. On the date of the survey, at least one child under 2.5 years of age needed to reside in the household. In the event that more than one eligible child resided in the household, an index child was selected at random from a household inventory. The mother or legal guardian of the index child had to speak English or Spanish and the interview was conducted in her preferred language. There was no attempt to verify birth certificate matching to minimize the risk of breaching confidentiality.

### *Data Collection*

The survey was conducted from October 1, 2007, to April 7, 2008. Blaise 4.6 (Statistics, Netherlands), a computer-assisted telephone interview software package was used to conduct the survey. A minimum of 12 call-back attempts were made, including at least one evening, one weekend, and one daytime call before a number was dropped. Interviews could be scheduled by the subject. Interviewers were trained to consistently administer the survey and to manage reluctance and refusal. The survey was translated into Spanish and

independently back-translated for use with Spanish speaking mothers. All respondents were provided phone numbers of parenting resources as part of a routine debriefing. At the start of the interview, after eligibility was determined, the phone number and identity of the respondent were purged from the interviewer's computer to provide anonymity to the respondent. This approach to anonymity mirrored an earlier study that developed this approach in consultation with the North Carolina Attorney General's Office.<sup>18</sup> This ensures that voluntary participation did not place the subject at risk of being reported to child protective services. This study was approved by the University of North Carolina at Chapel Hill Biomedical Institutional Review Board.

### *Measures*

The survey was designed to assess parenting behaviors, disciplinary practices, and family and community characteristics for a representative sample of mothers of young children. Parenting behaviors were assessed using the Parent Child Conflict Tactics Scale (PCCTS).<sup>36</sup> The PCCTS asks parents about a variety of positive and negative discipline techniques, including positive and negative reinforcement, corporal punishment, and potentially abusive behaviors (e.g. beating, burning, shaking). The questions from the PCCTS were asked both about the responding mother's behaviors and the behaviors of her partner toward the index child (two separate questions). The use of anonymous surveys to assess potentially abusive caregiver behaviors builds on the work of Straus showing that caregivers do report harsh and socially disapproved forms of discipline at rates far higher than known rates of child maltreatment when guaranteed anonymity.<sup>82</sup> The PCCTS has been

widely used to assess parenting practices.<sup>18, 59, 82, 83</sup> The PCCTS has moderate reliability with regard to psychological aggression ( $\alpha = 0.60$ ).<sup>36</sup> Several studies have shown good construct validity for the PCCTS.<sup>36, 84, 85</sup> One study has shown fair discriminant validity for the PCCTS by demonstrating that mothers with a history of maltreating a child had higher scores on the scales for neglect and psychological aggression.<sup>86</sup>

Questions regarding psychological aggression included in the survey were: In the past year, how many times have you [your husband/partner] threatened to leave or abandon [him/her]? In the past year, how many times have you [your husband/partner] shouted, yelled, or screamed at [child name]? In the past year, how many times have you [your husband/partner] cursed or sworn at [him/her]? In the past year, how many times have you [your husband/partner] threatened to kick [child name] out of the house or send [him/her] away? In the past year, how many times have you [your husband/partner] locked [child name] out of the house? In the past year, how many times have you [your husband/partner] called [child name] names like stupid, ugly, or useless? In the past year, how many times have you [your husband/partner] refused to speak to [child name] as punishment? In the past year, how many times have you [your husband/partner] withheld food from [child name] as punishment?

Demographic information was collected about the respondent and her family, including socioeconomic status indicators, self reported race and ethnicity (using US Census categories), age, partner age, education (in years), partner education (in years), child age (calculated from date of birth and date of survey), and marital status. Child age was converted to months by dividing the number of days by 30.5. Household income was queried in \$20,000 increments using mutually exclusive categories and then recoded into

mutually exclusive \$40,000 categories. Three separate questions were asked regarding receipt of public assistance, Medicaid, Temporary Assistance for Needy Families (TANF), and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). These three variables were recoded as a single dichotomous variable such that respondents were coded as receiving one or more types of public assistance or none. Race and ethnicity are included because of their connection to child maltreatment reported in the literature.

### *Weighting*

Data were weighted to account for disproportionality in the sample arising from the sampling process. The weighting procedures allow the survey results to best approximate the true frequencies of behaviors of the target population in North Carolina. Variables used in the weighting process were mother's and father's education, mother's age, tobacco or alcohol use during pregnancy, marital status, race/ethnicity of mother, urbanization of county.

### *Analysis Plan*

All demographic variables were reported as unweighted and weighted frequencies for categorical variables and means with standard deviations for continuous variables. Each parent reported behavior and the derived variables were plotted as histograms by child age to display in a visual format the proportion of children at each age subjected to the reported parenting behavior.

All psychological aggression variables were coded as dichotomous variables; mothers reporting that they or their partner used a behavior towards the index child in the last year were coded as using that behavior, and all others are coded as not using that behavior. Behaviors of the mother and her partner were reported as weighted rates. As we expected yelling to be common or even normative, we derived a dichotomous severe psychological aggression variable that includes all other types of psychological aggression. The term ‘severe’ merely indicates that this variable excluded yelling. Clearly, there can be yelling that is far more ‘severe’ than name-calling. However, the PCCTS does not include a subscale for severity of psychological aggression. Severe psychological aggression represented all mothers who endorsed that they or their partner used one or more forms of psychological aggression towards the index child except yelling. We also derived a dichotomous variable for frequent yelling. We first generated a continuous variable for yelling from the standard response options of the PCCTS. Each mother was asked to report her frequency of yelling and her partner’s spanking frequency in the last year. The following response options were used: once in the past year, twice in the past year, 3-5 times in the past year, 6-10 times in the past year, 11-20 times in the past year, more than 20 times in the past year, not in the past year but this has happened, never, don’t know, and refused. Other options were assigned a value of the reported number or a midpoint value (1, 2, 4, 8, 15, 25 respectively). Twenty five was chosen for the highest category. The value of the mother’s response was added to the response for her partner, if present. The new variable has a range of 0-50. We derived a new dichotomous variable for frequent yelling representing those mothers who report that they and then partner yell greater than or equal to 12 times in the last year versus less than 12 times (0-11) in the last year. The use of this cut point was chosen

because it represents yelling one or more times per month on average and because of the distribution of data. Each individual frequency greater than or equal to twelve was reported infrequently ( $\leq 2\%$ ), whereas the frequencies less than 12 were endorsed more often (several in the 5-7% range). Bivariate survey weighted logistic regression tests hypotheses that reported behaviors vary by maternal race, ethnicity, age, income, and education, and reporting use of spanking.

### *Response rate*

The target sample size was 3,450 mothers to have sufficient power to describe frequencies of uncommon behaviors with adequate precision. See the figure for a description of sample acquisition and disposition. We assessed the response rate using the American Association for Public Opinion Research (AAPOR) Standard Definitions.<sup>87</sup> Unknown numbers were adjusted for eligibility for inclusion in the denominator by determining the proportion which, if contacted, should be eligible. This conservative approach to the determination of response rates is known as response rate option 4 and yielded a response rate of 53.6%. AAPOR 4 represents the lower bounds of probably true response rates and is the response rate most often cited in scholarly reports. A less conservative calculation for response rate (AAPOR option 6) yields a response rate of 70.2%.

## **Results**

### *Subject Characteristics*

Table 1 reports both unweighted and weighted maternal and family characteristics for the 2946 maternal respondents. The majority of mothers surveyed were married, middle to



high income, and of Caucasian ethnicity. Nearly half (48%) of mothers surveyed were college graduates. More than 99% of respondents were the biological mothers of the index child. The index children were between 3 and 27 months of age. There were roughly equal numbers of boys and girls. Most respondents were between 21 and 35 years old (75.3%), married (81.6%), and white (62.4%). A majority of respondents report household incomes of \$40,001-\$80,000 (31.6%) or more than \$80,000 (26.3%) with the remaining subjects reporting household incomes less than \$40,001 (42.1%). Self-reported smoking and alcohol drinking during pregnancy was reported by 9.5% and 4.4% of subjects respectively. Spanking was reported by nearly one-third (31.6%) of mothers. There were no children under three months and approximately 5% of the children were over 24 months but all under 29 months due to the sampling procedure and inclusion criteria. Children were roughly equally distributed from four to 24 months, with fewer children in the three to four month age range due to the delay in finalizing the birth certificate data file.

More than one-third (38.8%) reported that they or their partner had yelled at the index child in the last year. Yelling 12 or more times in last year was reported by 10.6% of mothers. Other more severe forms of psychological aggression were less commonly reported by mothers (e.g. threatening to kick out, withholding food, and locking out, calling names; all reported rates less than 0.4%). See Table 2 for frequencies of all reported types of psychological aggression. Seven percent of mothers reported the use of one or more types of severe psychological aggression in the past year.

Many of the hypothesized demographic associations yielded null results or results opposite to the hypothesized direction. We report the association between spanking and demographic variables with psychological aggression in Tables 3 and 4. For example, each

additional year in paternal and maternal education is associated with an increase in the odds of yelling by seven and eight percent, respectively with similar results for frequent yelling. Each additional year in parent age is associated with a 3% decrease in the odds of use of severe psychological aggression. The association between income and psychological aggression as well as race/ethnicity and psychological aggression were largely non-existent or the opposite hypothesized direction. There was little association between child gender and psychological aggression, the exception being that boys were at 24% higher odds of being yelled at more than 12 times in the last year than girls. Three hypothesized demographic variables, child age, use of tobacco during pregnancy, and use of alcohol during pregnancy demonstrated consistent associations with psychological aggression. Older children within this age group are at greater odds of receiving psychological aggression. See the appendix for histogram of the reported use of each psychological aggression behavior by child age (Figures 5.8-5.16). Each month increase in child age is associated with a 14% increase in the odds of yelling, 16% increase in frequent yelling, and 7% increase in the odds of any severe psychological aggression. Likewise, the use of tobacco or alcohol during pregnancy is associated an increase in the risk of most types of psychological aggression. Tobacco use during pregnancy is associated a threefold increase in the odds of cursing or swearing and any severe psychological aggression. The use of alcohol during pregnancy is associated with a twofold increase in yelling and any severe psychological aggression.

Parent reported use of spanking in the last year is strongly associated with nearly all types of psychological aggression. Spanking is associated with a six fold increase in the odds of yelling, frequent yelling and refusing to speak; a fourfold increase in withholding food, cursing or swearing, and any severe psychological aggression; and an 18 fold increase in the

odds of threatening to kick out of the house.

## **Discussion**

There are several key findings from this study. Most demographic variables have null associations or unexpected associations with psychological aggression. Surprisingly, more parent education is associated with an increase in the reported use of most types of psychological aggression. Little relationship was found for income, race, ethnicity, or parent age. A predicted association, older child age, has a relatively strong and consistent relationship with most types of psychological aggression. The same has been found for spanking.<sup>91</sup> One of the most important findings from this paper is the risk that reported alcohol and tobacco use during pregnancy has for psychological aggression. Parents who report using these drugs during pregnancy may be at risk for poor self-control, less parenting insight, drug or alcohol abuse, or other mental health problems. Finally, the relationship between spanking and psychological aggression is an important finding not previously reported in our review of the literature. Though perhaps not surprising, this findings underscores that yelling has not replaced spanking, and that parents who react negatively to child misbehavior may do so in a variety of ways. Parenting programs that seek to improve the quality of parenting must offer diverse types of parenting strategies that include an array of developmentally appropriate tools for teaching children and reducing coercive discipline.

There were a number of limitations to this study. First, this is a survey of mothers in the state of North Carolina and may not be representative of mothers across the US. Second, while respondents described their spouse or partner's discipline practices, we did not

specifically ask spouses or partners about such practices. Third, our phone survey included very few cell-phone users, potentially limiting the generalizability of our conclusions to cell-phone only users. Fourth, this study is cross-sectional and causality cannot be inferred. Fifth, because of the infrequent reports of most of the parenting behavior of interest, analytic power was limited despite the large sample size. For this reason, we limited analysis to bivariate associations. We focus on a large number of bivariate associations. Therefore increasing the risk of identifying an association when a true association does not exist. In many cases, the associations are consistent with extant literature and stated hypothesis. However, it is also likely that some associations are due to chance or a Type 1 error. Finally, self-reported disciplinary practices may be underestimations of actual prevalence due to the potential social stigma, even in an anonymous survey. Strengths of this study include that it is the largest reported study of parenting behaviors of very young children, the study is population-based, and therefore the findings can be generalized at least to one large and diverse Southeastern US state.

To equate yelling with psychological aggression is likely to make many parents uncomfortable and parent educators should tread cautiously when discussing the pros and cons of various discipline approaches. All psychological aggression is not psychological abuse. However, all psychological aggression, including yelling, is negative, coercive, potentially destructive, and largely ineffective or without evidence of effect. This study highlights the relationship between prenatal alcohol and tobacco use. In addition, this study highlights the relationship between spanking and psychological aggression, a finding which indicates that many children will be the subjects of coercive parenting of multiple forms. These children may be the most at risk for some of the consequence of psychological

aggression. Parenting education and anticipatory guidance from pediatricians, family physicians, and nurse practitioners should focus on effective discipline without aggression such as time in, time out, positive reinforcement, distraction, selective inattention, and token economies. There is a critical role for negative reinforcement, but this should be uncommon, not delivered emotionally, and with educational objectives that are clear to the parent and the child. Lastly, the prevalence of yelling and significant rates of more severe psychological aggression towards this very young sample of children underscores the importance of teaching parents appropriate developmental expectations and disciplinary strategies.

Figure 3.1: Sample acquisition and disposition

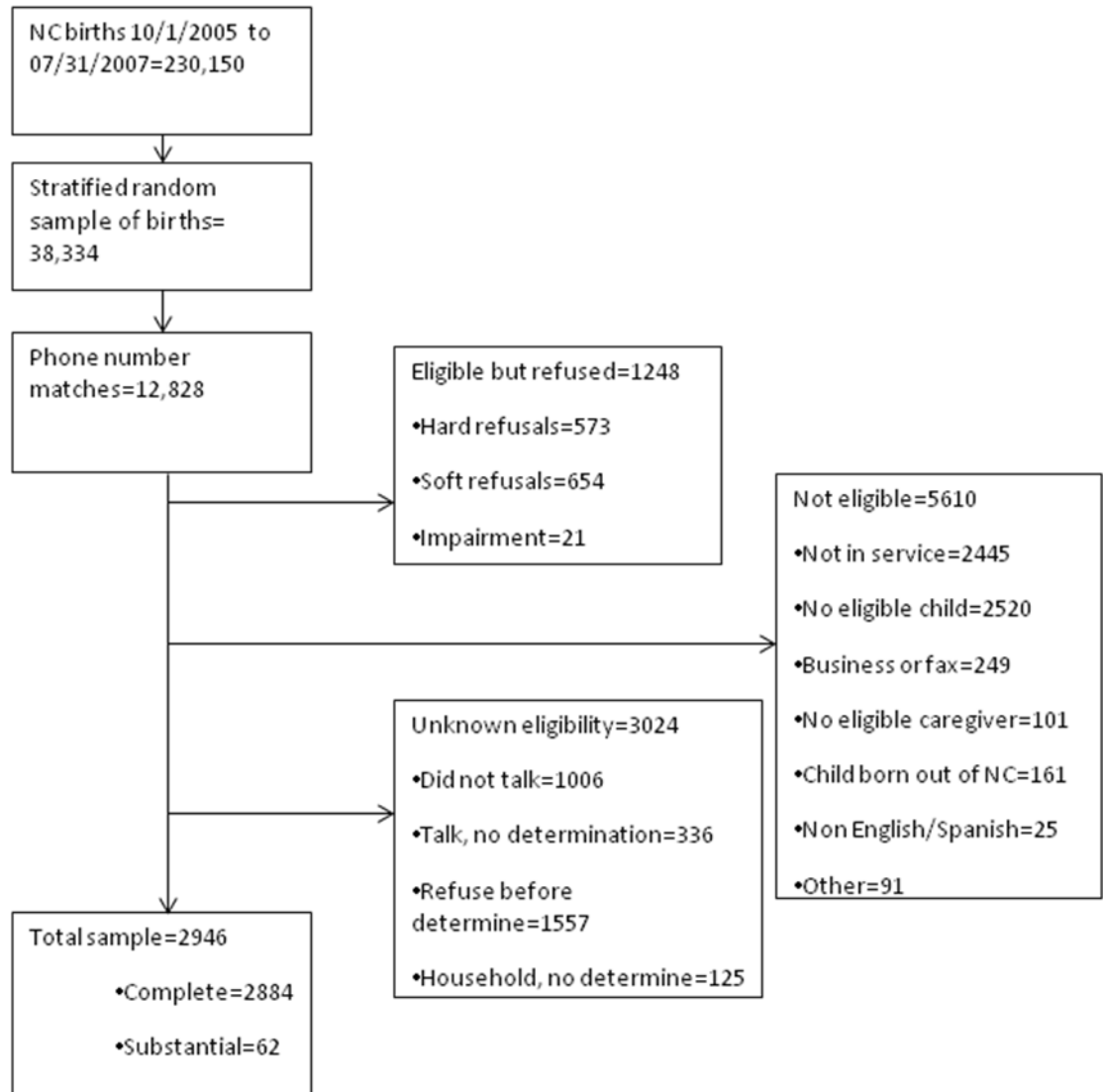


Table 3.1: Sample description of mothers of children 0-2 responding to a statewide survey on child discipline (N = 2946)

<b>Characteristic</b>	<b>Unweighted Percent or Mean (Standard Deviation)</b>	<b>Weighted Percent or Mean (Standard Error)</b>
Age of child, months	14.4 (6.37)	14.5 (0.15)
Sex of child		
Male	52.0	51.8
Female	48.0	48.3
Mother's Age	29.7 (5.75)	28.2 (0.09)
Father's Age	32.4 (6.30)	31.4 (0.13)
Mother's Education	14.2 (2.78)	13.3 (0.05)
Father's Education	14.01 (2.82)	13.22 (0.06)
Marital status		
Married	81.6	60.6
Single	18.4	39.4
Ethnicity/race (mutually exclusive categories)		

African American / Black	12.3	19.9
Asian / Pacific Islander	2.2	1.5
Hispanic	10.5	15.2
White / Caucasian	74.2	62.4
Native American / Indian	0.7	0.9
Other	0.1	0.6
Annual household income		
Less than \$40,001	29.0	42.1
40,001 – 80,000	35.4	31.6
80,001+	35.6	26.3
Receipt of Public Assistance (yes)	35.7	51.8
Tobacco during pregnancy	6.4	9.5
Alcohol during pregnancy	5.7	4.4
Spank last year	30.4	31.6



Table 3.2: Parent reported of psychological aggression towards children 0-2

Method	Percent	95% CI	Number reporting
Yell	38.8%	36.6-41.0	1168
Abandon	1.2%	0.7%-1.8%	26
Curse	3.5%	2.8%-4.5%	105
Threaten to kick out	0.3%	0.1-0.7%	7
Lock out	0	0	0
Call name	0.4%	0.2-0.8%	10
Refuse to speak	3.0%	2.3%-3.8%	86
Withhold food	0.3%	0.2%-0.6%	10
Combined severe (excludes yelling)	7.0%	6.0%-8.2%	207
Yell >12 times last year	10.6%	9.4%-11.9%	354

Table 3.3: Bivariate associations with types of psychological aggression (survey weighted logistic regression)

	Abandon		Yell		Curse		Threaten to kick out	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	CI
Father age	<b>0.93</b>	<b>0.87-1.00</b>	1.00	0.99-1.02	0.99	0.94-1.02	0.99	0.78-1.25
Mother age	0.96	0.89-1.03	1.00	0.99-1.02	0.99	0.95-1.03	1.03	0.92-1.15
Father education	0.96	0.90-1.02	<b>1.07</b>	<b>1.04-1.11</b>	1.01	0.93-1.09	0.84	0.62-1.13
Mother education	1.00	0.87-1.15	<b>1.08</b>	<b>1.05-1.12</b>	1.03	0.95-1.12	1.00	0.86-1.16
Child age (mos)	1.02	0.95-1.09	<b>1.14</b>	<b>1.12-1.16</b>	<b>1.03</b>	<b>1.00-1.07</b>	<b>1.10</b>	<b>1.02-1.19</b>
Child gender (boy ref)	0.80	0.31-2.09	0.96	0.80-1.15	0.69	0.41-1.14	0.44	0.08-2.38
Public assistance	2.03	0.79-5.20	<b>0.82</b>	<b>0.68-0.97</b>	0.99	0.61-1.62	2.10	0.38-11.39
Tobacco during pregnancy	3.07	0.94-10.03	1.27	0.90-1.81	<b>3.38</b>	<b>1.74-6.53</b>	6.81	0.81-57.48
Alcohol during pregnancy	3.04	0.77-12.04	<b>1.93</b>	<b>1.31-2.84</b>	<b>2.46</b>	<b>1.13-5.33</b>	1.77	0.19-16.08
Income (>\$80,000 ref)								
Low (≤\$40,000)	<b>3.41</b>	<b>1.28-9.10</b>	0.89	0.71-1.11	1.18	0.66-2.14	<b>0.45</b>	0.06-3.27
Middle \$40,001-\$80,000	1.33	0.35-4.96	1.08	0.88-1.33	1.30	0.73-2.32	0.39	0.05-3.26

Race/ethnicity (white non-Hispanic ref)								
Black	2.15	0.64-7.17	0.87	0.67-1.14	0.80	0.38-1.70	0.26	0.029-2.39
Hispanic	2.65	0.91-7.73	0.76	0.56-1.02	<b>0.12</b>	<b>0.02-0.94</b>	*	
Other	*		1.00	0.60-1.68	*		*	
Not married (married reference)	2.30	0.96-5.48	0.84	0.68-1.04	1.39	0.83-2.32	1.46	0.22-9.75
Spank	1.92	0.76-4.84	<b>6.38</b>	<b>5.19-7.85</b>	<b>4.27</b>	<b>2.61-6.99</b>	<b>17.91</b>	<b>1.96-163.39</b>

\*Bold indicates statistical significance  $p < 0.05$

\*\* Indicates cell size too small for logistic regression

Table 3.4: Bivariate associations with types of psychological aggression continued (survey weighted logistic regression)

	Call name		Refuse to speak		Withhold food		Combined Severe (excludes yelling)		Yell $\geq$ 12 times last year	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Father age	1.03	0.91-1.18	0.98	0.94-1.01	0.96	0.87-1.05	<b>0.97</b>	<b>0.94-0.99</b>	<b>1.03</b>	<b>1.01-1.05</b>
Mother age	0.98	0.84-1.16	0.96	0.92-1.00	0.99	0.91-1.08	<b>0.97</b>	<b>0.94-0.99</b>	<b>1.04</b>	<b>1.02-1.07</b>
Father education	1.08	0.89-1.30	<b>1.11</b>	<b>1.01-1.23</b>	1.30	0.93-1.83	1.05	0.99-1.11	<b>1.11</b>	<b>1.05-1.18</b>
Mother education	0.98	0.77-1.25	<b>1.05</b>	<b>0.95-1.15</b>	1.77	1.08-2.89	1.06	1.00-1.12	<b>1.13</b>	<b>1.07-1.20</b>
Child age (mos)	<b>1.08</b>	<b>1.01-1.15</b>	<b>1.15</b>	<b>1.10-1.20</b>	1.04	0.95-1.14	<b>1.07</b>	<b>1.04-1.10</b>	<b>1.16</b>	<b>1.14-1.19</b>
Child gender (boy ref)	1.18	0.26-5.36	0.90	0.54-1.52	1.57	0.36-6.81	0.86	0.61-1.22	<b>0.76</b>	<b>0.58-1.00</b>
Public assistance	1.28	0.30-5.37	1.02	0.61-1.70	0.28	0.04-2.22	1.05	0.75-1.48	<b>0.56</b>	<b>0.43-0.76</b>
Tobacco during pregnancy	0.74	0.09-6.17	<b>2.61</b>	<b>1.19-5.74</b>	2.95	0.37-23.61	<b>2.98</b>	<b>1.79-4.95</b>	<b>1.68</b>	<b>1.06-2.66</b>
Alcohol during pregnancy	*		1.58	0.57-4.33	2.12	0.26-17.24	<b>2.31</b>	<b>1.25-4.28</b>	<b>1.90</b>	<b>1.16-3.12</b>
Income (>\$80,000 ref)										
Low ( $\leq$ \$40,000)	1.26	0.26-6.13	1.26	0.68-2.32	*		1.18	0.78-1.78	0.75	0.54-1.05

Middle \$40,001-\$80,000	0.46	0.08-2.53	1.22	0.66-2.25	0.72	0.17-3.13	1.17	0.78-1.76	1.14	0.86-1.52
Race/ethnicity (white, non-Hispanic ref)										
Black	*		1.00	0.42-2.40	*		0.90	0.53-1.55	<b>0.50</b>	<b>0.31-0.81</b>
Hispanic	1.35	0.16-11.13	1.18	0.58-2.43	*		<b>0.54</b>	<b>0.29-0.99</b>	<b>0.36</b>	<b>0.20-0.64</b>
Other	*		<b>3.56</b>	<b>1.39-9.11</b>	*		1.20	0.48-2.99	<b>0.37</b>	<b>0.14-0.98</b>
Not married (ref married)	1.30	0.27-6.32	1.08	0.61-1.91	0.46	0.58-3.66	1.23	0.85-1.79	<b>0.46</b>	<b>0.32-0.68</b>
Spank	3.64	0.76-17.29	<b>6.09</b>	<b>3.45-10.76</b>	<b>4.08</b>	<b>1.08-15.45</b>	<b>4.05</b>	<b>2.83-5.78</b>	<b>6.79</b>	<b>5.09-9.06</b>

\*Bold indicates statistical significance  $p < 0.05$

\*\* Indicates cell size too small for logistic regression

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## CHAPTER 4: CONCLUSIONS

This study reports population-based rates of severe physical discipline and psychological aggression towards children in a large sample of mothers of children less than two years of age. Rates of self-reported severe physical discipline are lower than in a previous study in North and South Carolina.<sup>18</sup> These rates are also substantially higher than reported physical abuse of young children or rates of AHT for children under two.<sup>16, 38</sup> Most forms of physical discipline increased in frequency as children aged. The exception to this was shaking, which has a consistently reported association with crying, a developmental phenomenon that peaks at 2-3 months of age, near the peak of abusive head trauma.<sup>27, 88</sup> All types of physical discipline except spanking were reported by fewer than 3% of subjects. Only one other population-based study examined victimization of children under two, albeit with differences in measurement, base population (US versus NC), lower response rate (43%), and less precision due to smaller sample (n=503). This earlier study reported a physical abuse rate of 0.6% (95% CI -0.1-1.3%).<sup>81</sup> This compares to 1.8% in the current study. The current study reports with greater specificity at types of physical victimization, such as shaking, which may be relevant to specific approaches to prevention.

A previous NC population-based study (data collected in 2002) reported shaking rate of 2.6% or 152 times the rate of severe AHT in NC as reported in a prospective study of pediatric intensive care units and the medical examiners office.<sup>18</sup> An earlier national study

reported shaking of children under two at a rate of 2.4%.<sup>36</sup> In this study, we found reported shaking to occur at 1.0% or 58 times the rate of severe AHT as measured by prospective surveillance in pediatric intensive care units and medical examiner cases in 2000 and 2001.<sup>16</sup> Despite the lack of literature on the consequences of reported shaking not brought to medical attention; the emerging literature on mild traumatic brain injury and the vulnerability of the infant brain suggest possible detrimental consequences.

In order to better understand the meaning of reported shaking, we asked about parents' emotional status associated with shaking. Of the reported self or partner shakings, 90% of subjects endorsed anger or frustration, potential for harm, or an aversive trigger, most commonly crying. The other 10% endorsed none of these characteristics and even reported triggers such as playing and smiling. This could indicate that the true rate of shaking as a potentially abusive act among those who reported shaking (or partner shaking) is 0.9%. However, social desirability bias may lead to underreporting. We asked parents about observing someone else shaking a young child, an item endorsed at nearly four times the rate of self or partner reported shaking and accompanied by much higher rates of anger or frustration. Clearly we cannot determine who of these subjects were really reporting, now more honestly in this once removed scenario, about their own behavior. Shaking, especially in anger or frustration, seems unlikely to be done publicly. To assess the relationship between observed shaking and self/partner reported shaking, we used a logistic regression analysis and found that mothers who reported observed shaking were at nearly four times the odds of reporting self or partner shaking. This reinforces the notion that these mothers might be referring to their own behavior. It is also possible that social learning has led them to the

use of this behavior or that mother's with risk factors for shaking tend to have others in their social network with similar risk factors.

Psychological aggression towards children is reported by nearly 40% of mothers. More severe forms of psychological aggression are reported by 7% of mothers. There are several key findings regarding psychological aggression. Most demographic variables have null associations or unexpected associations with psychological aggression. Surprisingly, more parent education is associated with an increase in the reported use of most types of psychological aggression. Little relationship was found for income, race, ethnicity, or parent age. A predicted association, older child age, has a relatively strong and consistent relationship with most types of psychological aggression. The same has been found for spanking.<sup>91</sup> An important finding from this paper is the risk that reported alcohol and tobacco use during pregnancy has for psychological aggression. Parents who report using alcohol or tobacco during pregnancy may be at risk for poor self-control, less parenting insight, drug or alcohol abuse, or other mental health problems. The relationship between spanking and psychological aggression is an important finding not previously reported in our review of the literature. Though perhaps not surprising, this findings underscores that yelling has not replaced spanking, and that parents who react negatively to child misbehavior may do so in a variety of ways. All psychological aggression is not psychological abuse. However, all psychological aggression, including yelling, is negative, coercive, potentially destructive, and largely ineffective or without evidence of effect. Parenting programs that seek to improve the quality of parenting must offer diverse types of parenting strategies that include an array of developmentally appropriate tools for teaching children and reducing coercive discipline.

The findings of this study will be helpful in understanding the parent behavior of shaking as a potentially preventable risk for abusive head trauma as well as other severe physical punishments and psychological aggression towards young children. This understanding of the context for parenting of young children may inform more effective preventive interventions. Parenting education and anticipatory guidance from pediatricians, family physicians, and nurse practitioners should focus on effective discipline without aggression such as time in, time out, positive reinforcement, distraction, selective inattention, and token economies. There is an important role for negative reinforcement, but this should be uncommon, not delivered emotionally, and with educational objectives that are clear to the parent and the child. Furthermore, this work is an important step in understanding the frequency of shaking that does not result in severe injury or medical attention. These children may be subject to more subtle behavioral and developmental deficits that may have tremendous downstream cost and consequence.

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## APPENDIX: PARENTING BEHAVIORS BY CHILD AGE

The following series of figures represents histograms of parenting behaviors by child age. Most forms of reported and substantiated physical abuse are more common among older children.<sup>1,2</sup> The Fourth National Incidence Study found that the rate of reported physical abuse among children ages twelve to fourteen was significantly higher than the incidence among children ages zero to two.<sup>1</sup> Studies of AHT have shown that infants, particularly between three and five months, are at highest risk of AHT. This has been associated with the normal developmental peak of infant crying.<sup>3-5</sup> Studies examining the association between child age and psychological aggression have found that increasing child age is a risk factor. That is to say older children are more often the subject of psychological aggression.<sup>6,7</sup> The following figures display the rates of physical discipline and psychological aggression by child age in months.

Figure 5.1: Spanking by child age (months)

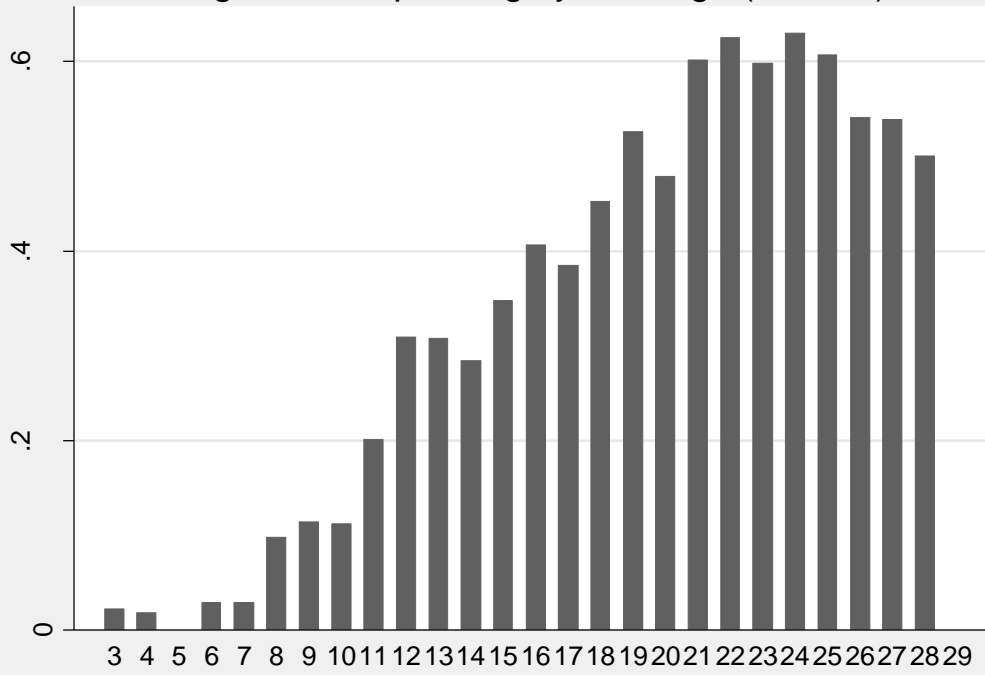




Figure 5.2: Object on buttocks by child age (months)

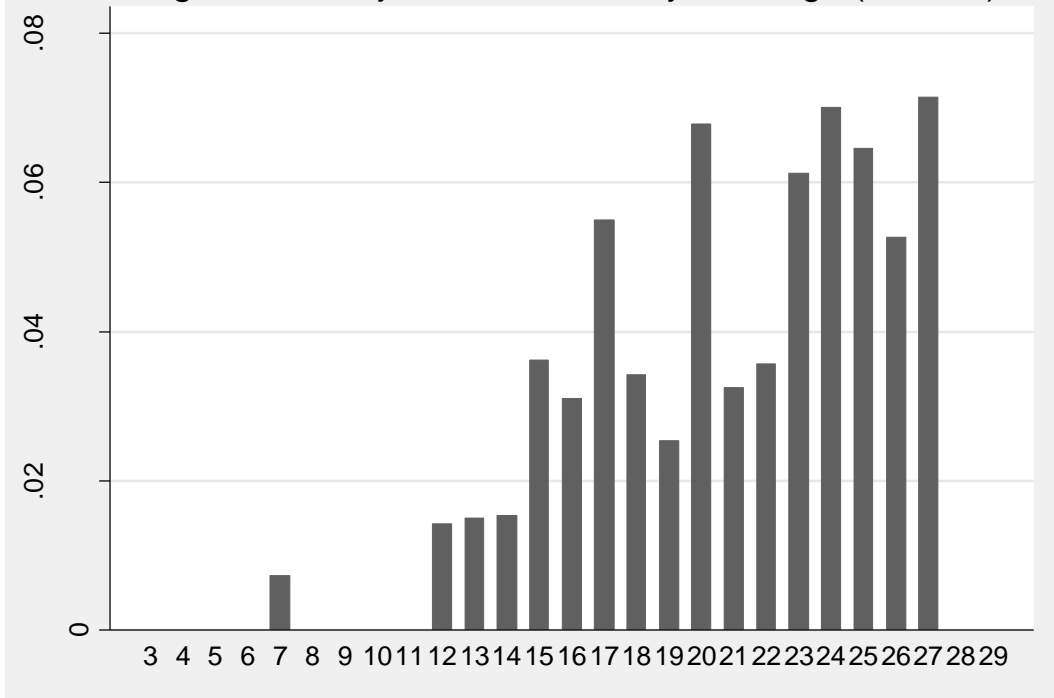


Figure 5.3: Pinched by child age (months)

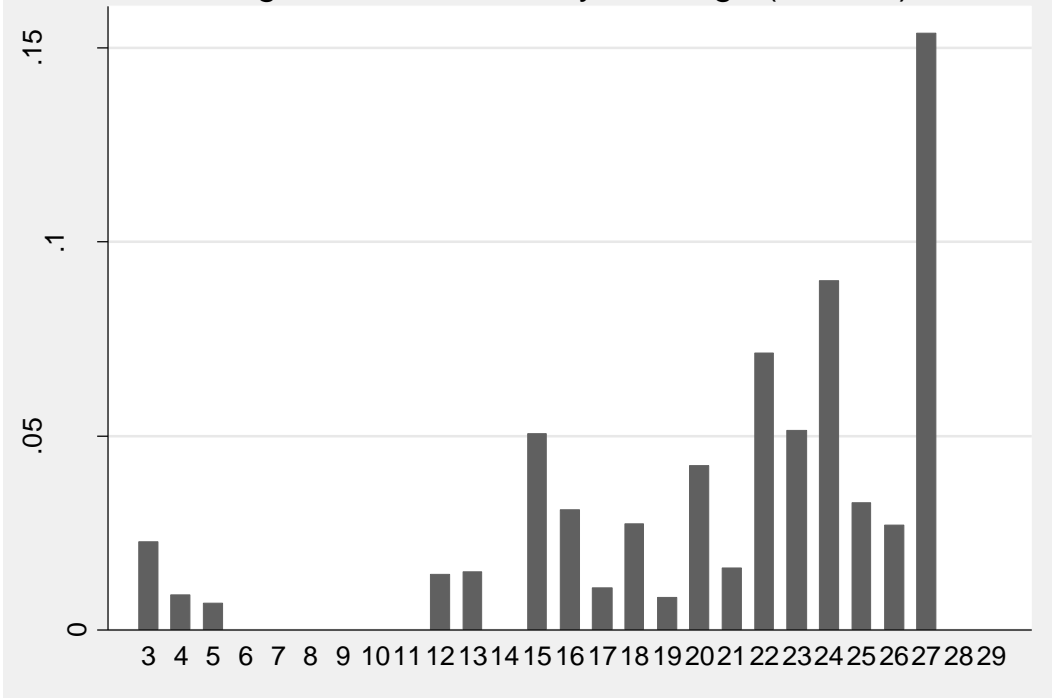


Figure 5.4: Slapped on face by child age (months)

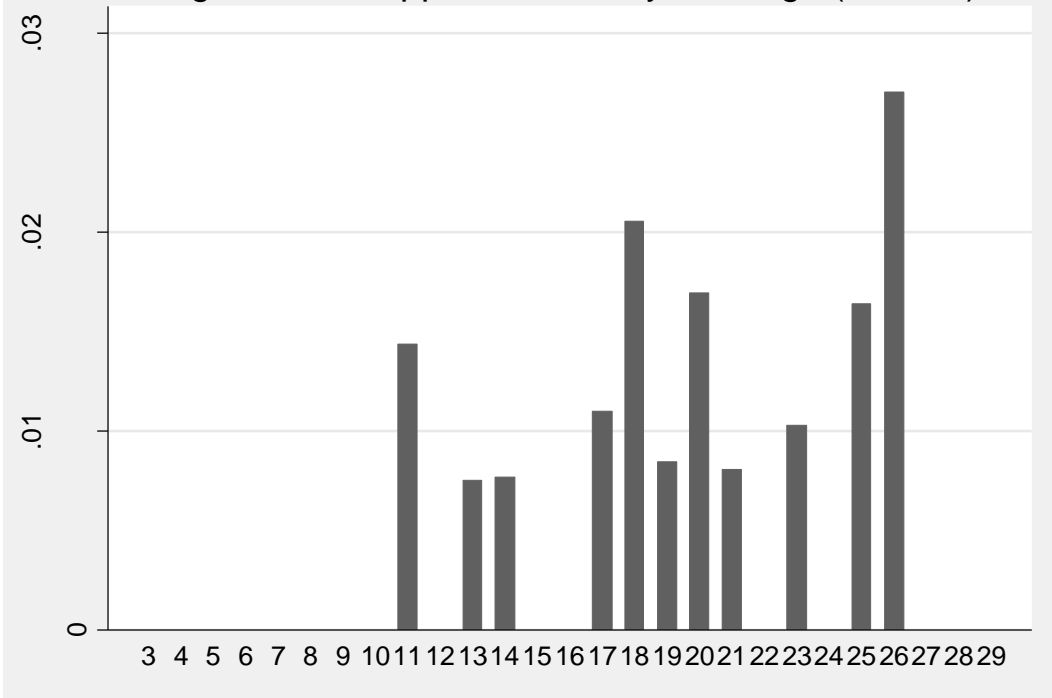


Figure 5.5: Object not on buttocks by child age (months)

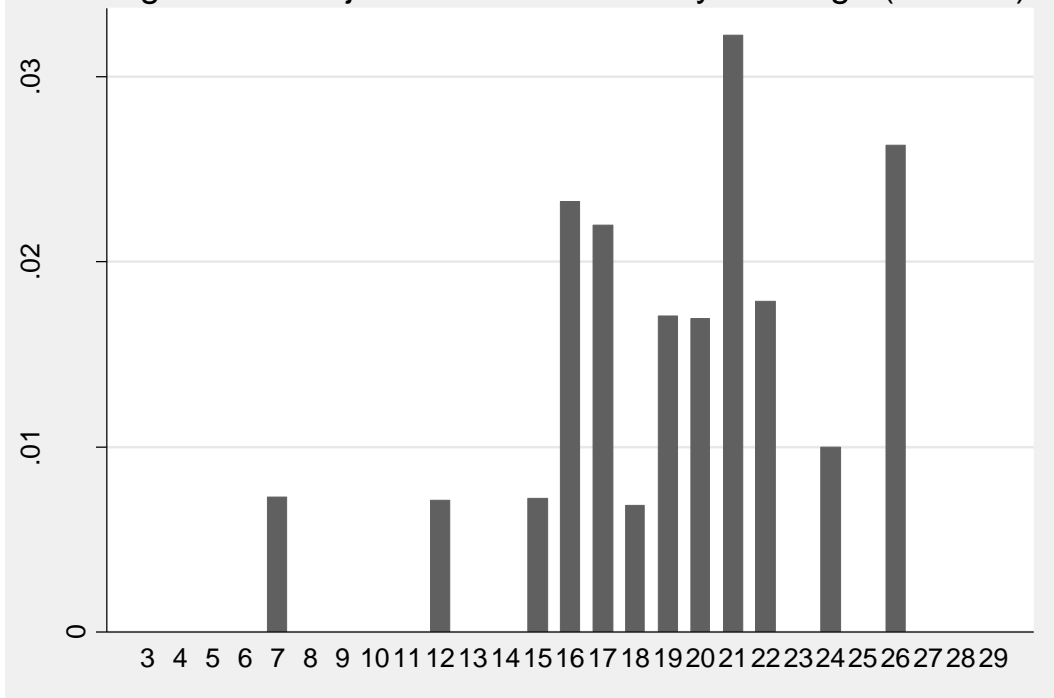
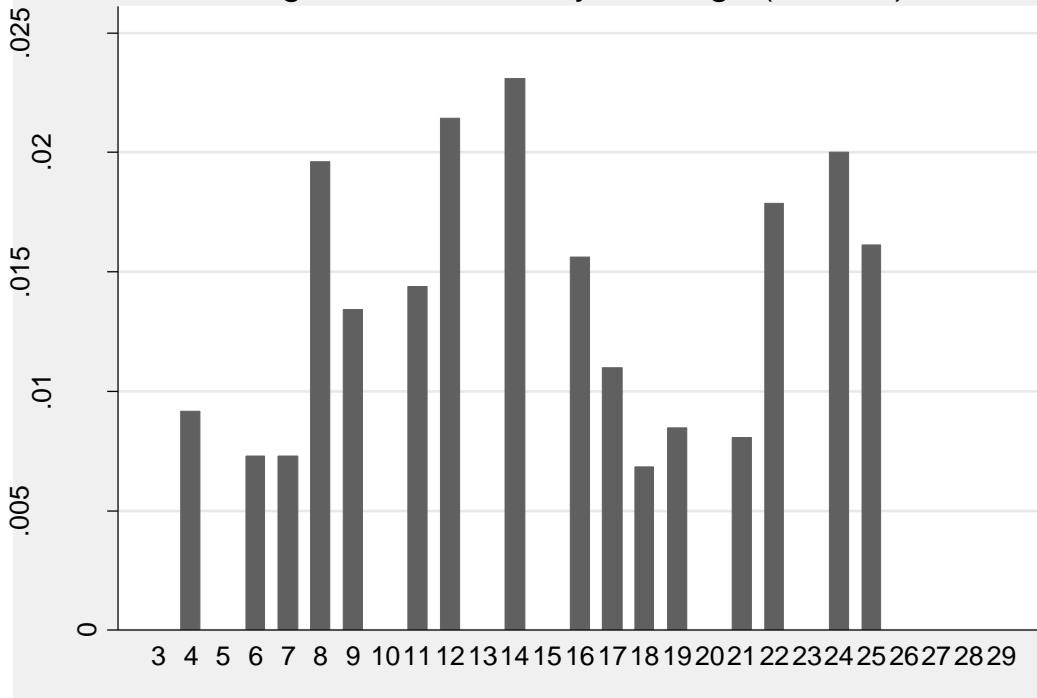
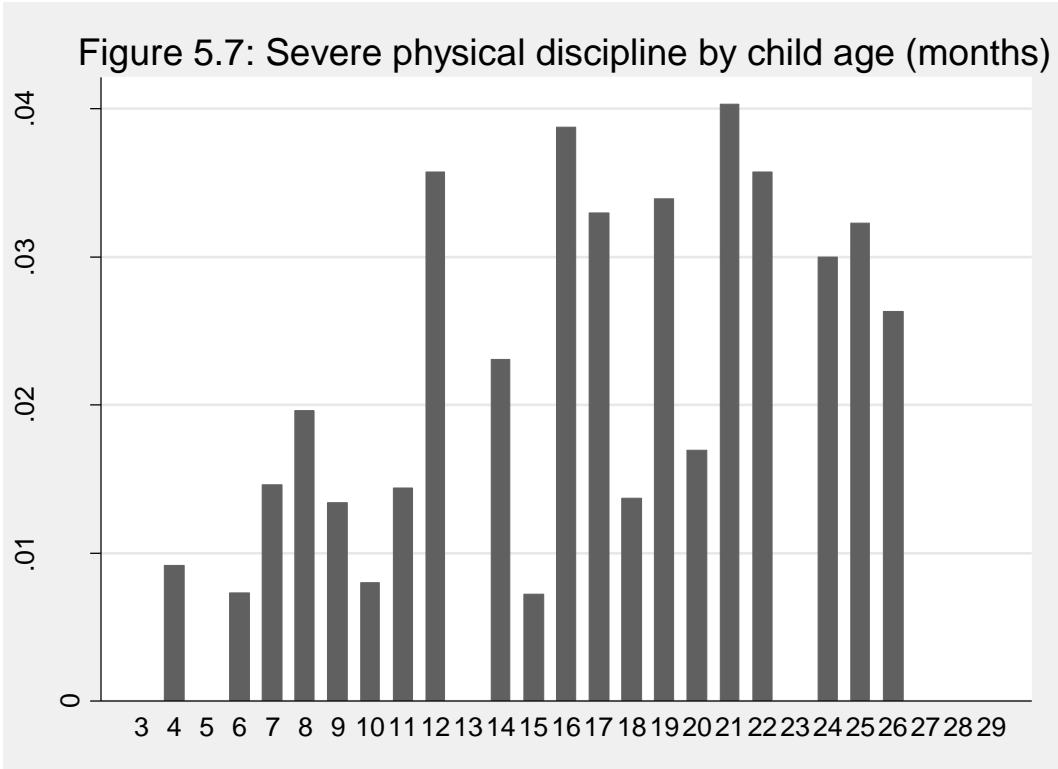


Figure 5.6: Shake by child age (months)





\*Includes Beating, burning, kicking, object not on buttocks, and shaking.

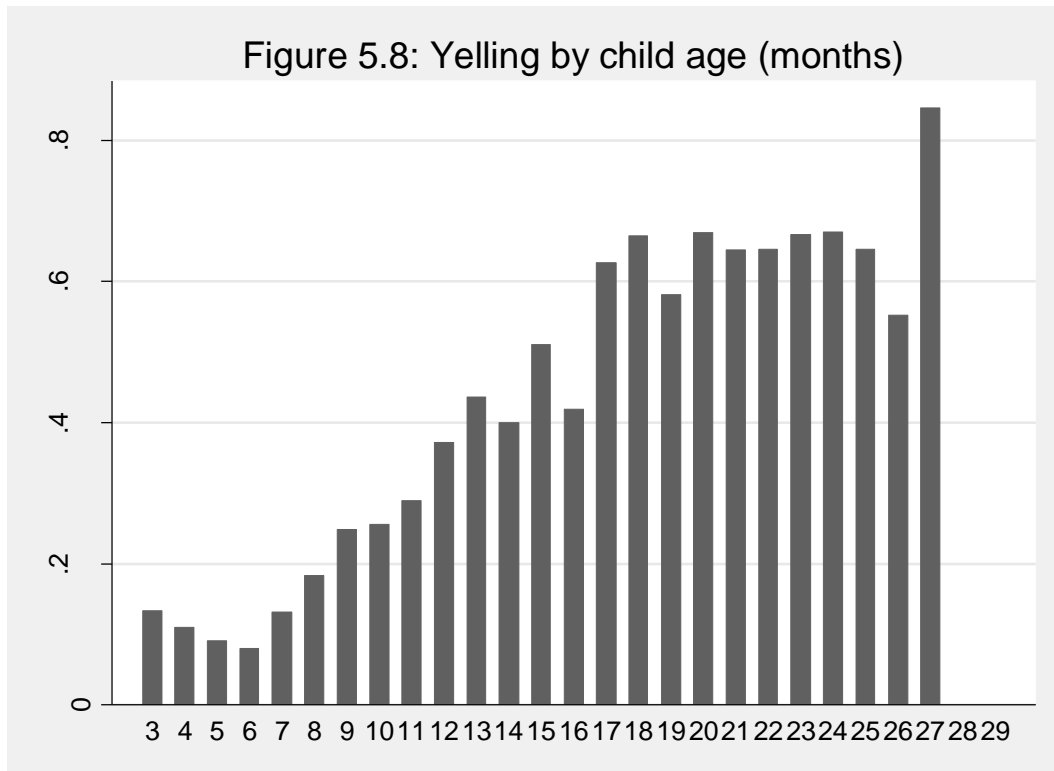


Figure 5.9: Abandon by child age (months)

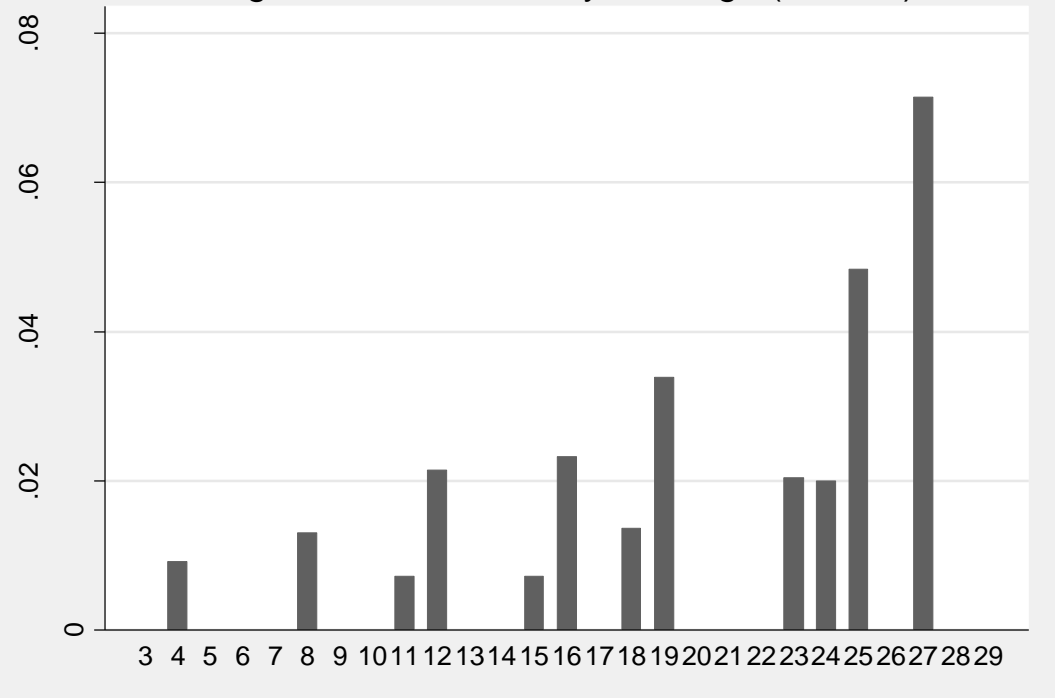
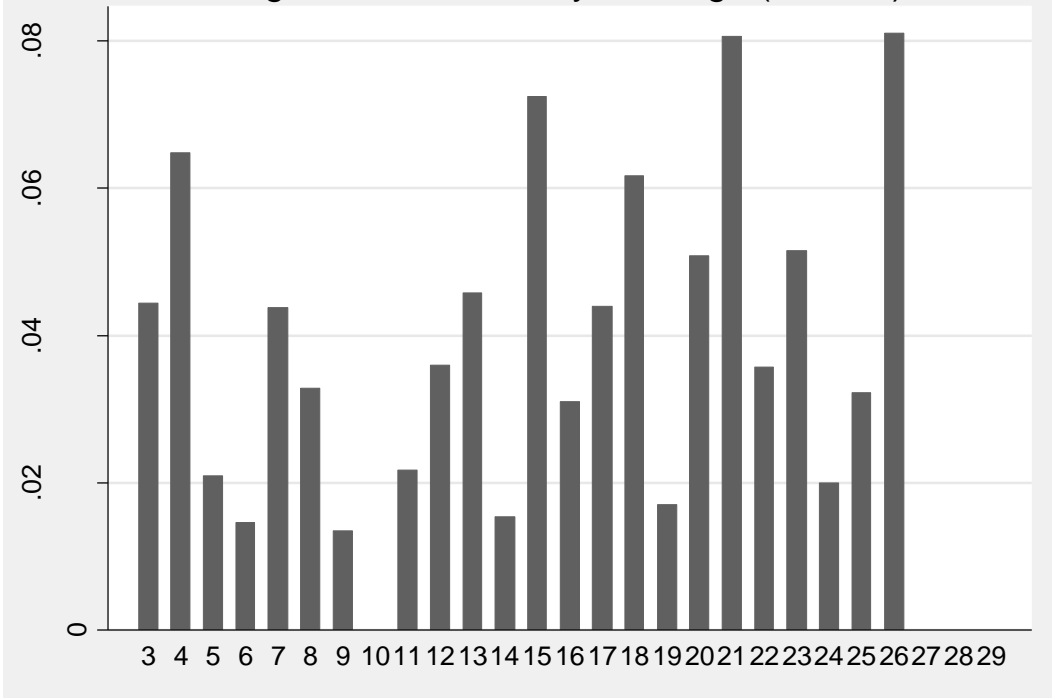




Figure 5.10: Curse by child age (months)



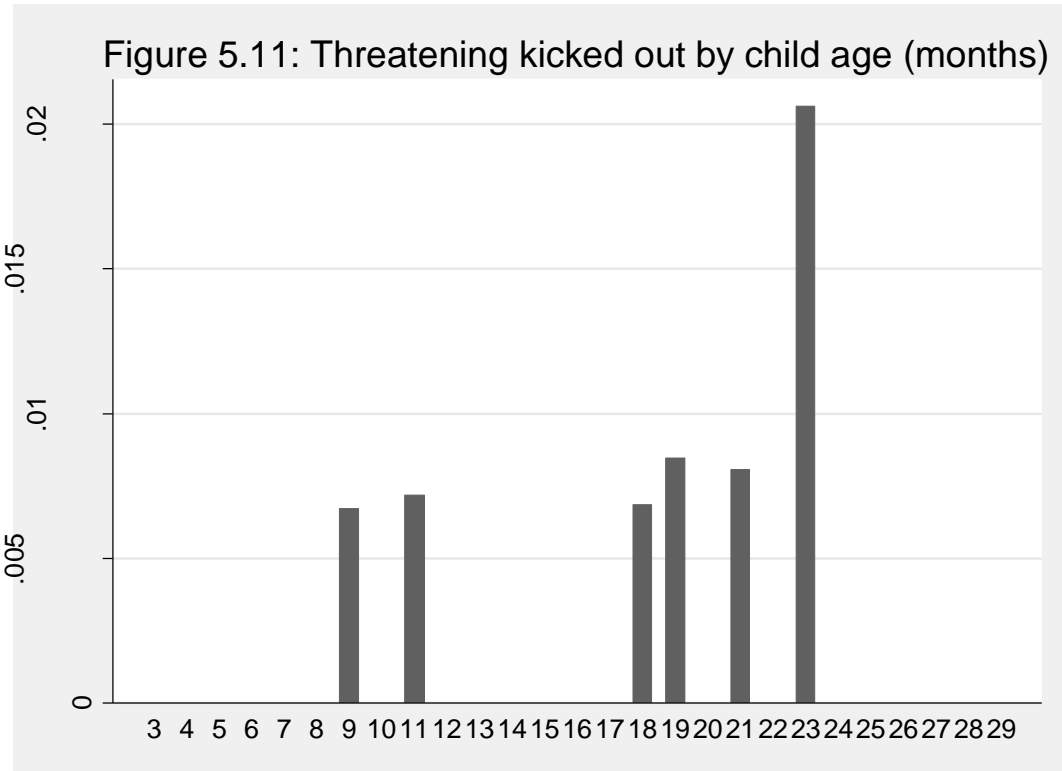


Figure 5.12: Called name by child age (months)

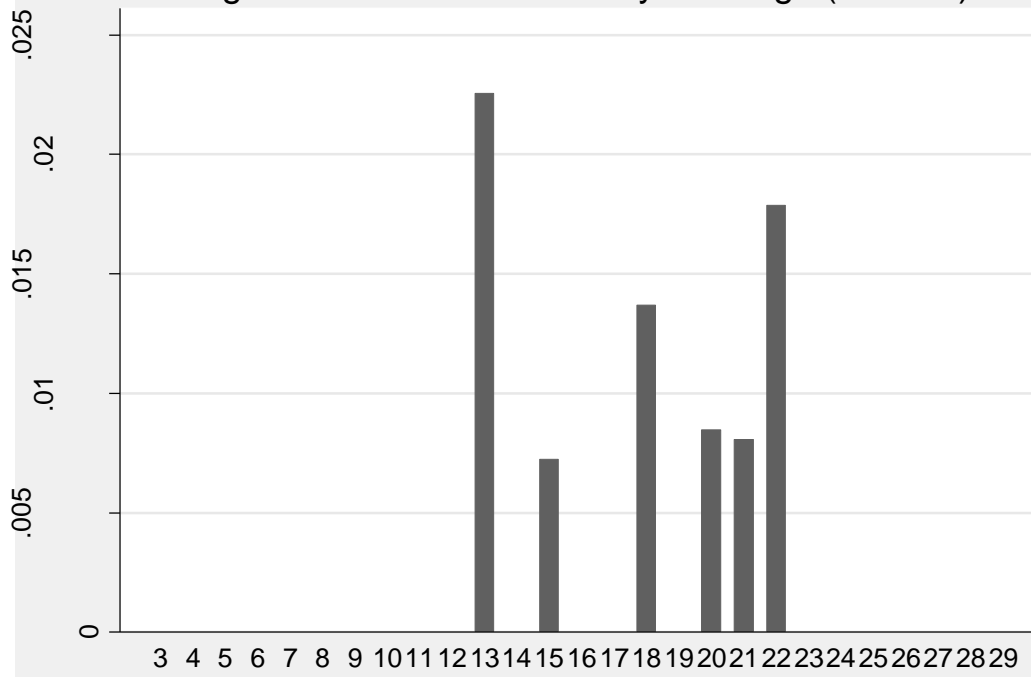


Figure 5.13: Refused to speak by child age (months)

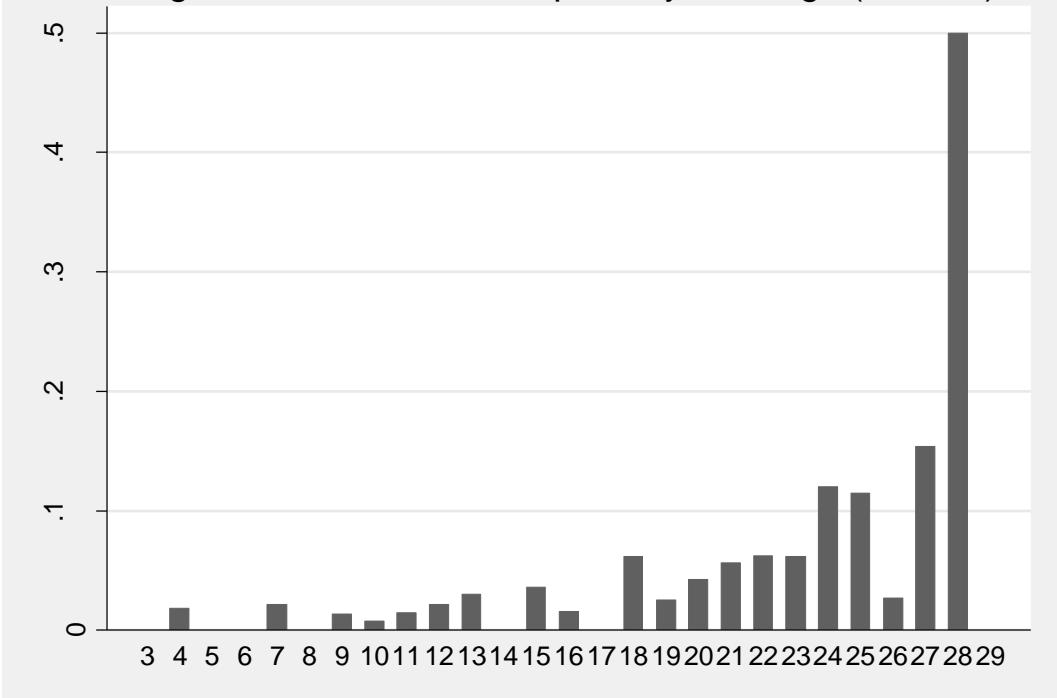
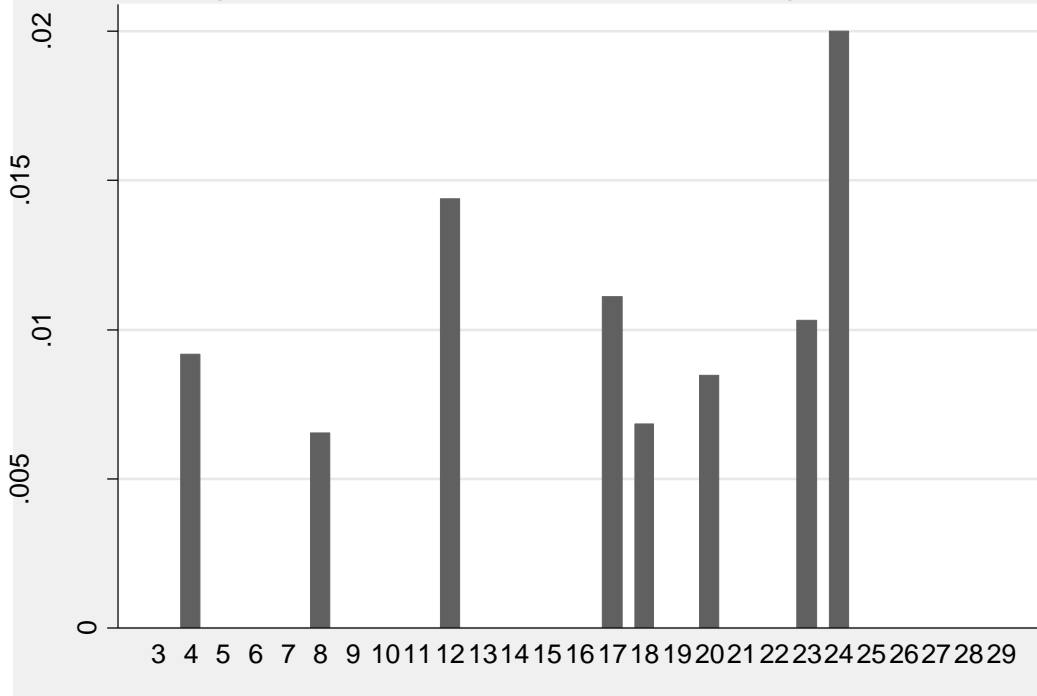
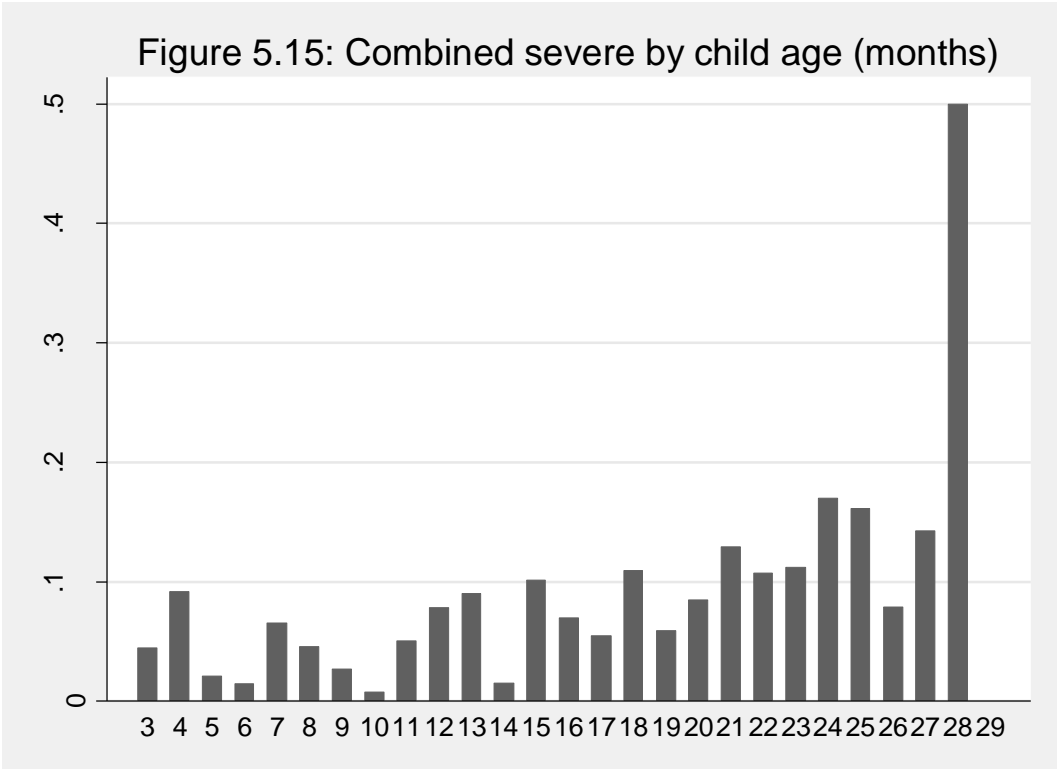
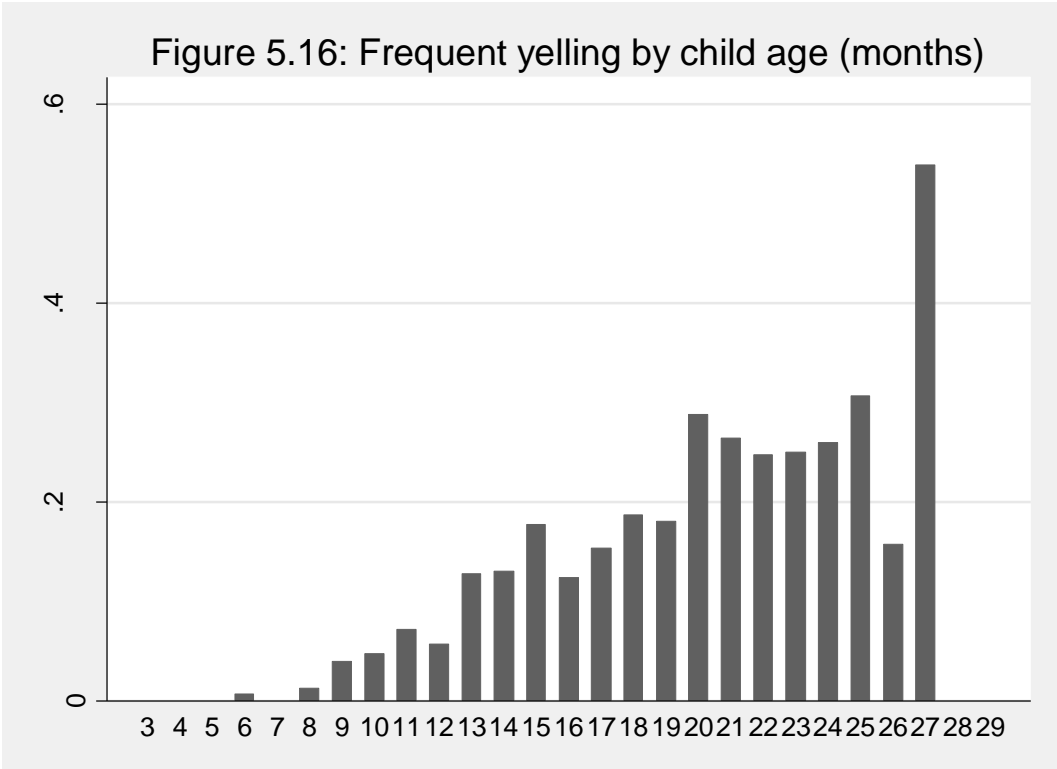


Figure 5.14: Withheld food by child age (months)





\*Includes all psychological aggression except yelling



\*Yelling 12 or more times in the past year

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