

Parenting and Early Childhood Aggression in a Low Income South African Sample

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Abstract

Violence is a serious problem in South Africa. Child aggression has been shown to be highly predictive of future violence perpetration. Research from high-income-countries has found that parenting is strongly associated with the development of child aggression. This study investigated whether the association between caregiver discipline and child aggression/defiance held in a low-income South African sample. Self-reports (using the Child Behavior Checklist (CBCL), and Discipline and Violence questionnaires) and ecologically valid observational data were obtained from a sample comprising 69 children aged 22-28 months and their caregivers. Correlational and regression analyses were used to establish the relationship between carer discipline strategies and child aggression/defiance. The role of gender in discipline and child defiance was also examined. Further, correlational analyses and contingency tables were used to examine the relationship between self-report and observational variables. Finally, exploratory regression analyses were run to investigate the direction of effects between discipline and child aggression/defiance.

Harsh discipline was found to be significantly associated with higher levels of child aggression/defiance, and positive carer guidance with lower levels. More observed parenting variables predicted child behaviour than reported ones. Boys were observed as more defiant than girls, and received harsher physical discipline. However, the relationship between discipline and child aggression/defiance did not differ between girls and boys. Parents who reported using non-violent discipline were also observed as such; however, what parents reported about their use of harsh discipline did not correspond to what was observed. Furthermore, the CBCL performed poorly as a case identifier using observed defiance as the criterion. Finally, exploratory analyses indicated that a direct relationship held between harsh parenting and child behavioural problems. These findings provide impetus for longitudinal research with larger samples in LMICs and for research into interventions to reduce negative parenting and promote positive parenting.

Keywords: child; carer; parenting; discipline, aggression; defiance

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Parenting and Early Childhood Aggression in a Low Income South African Sample

Violence is a significant problem in South Africa and in 2000 was the second leading cause of death and disability adjusted life years (Seedat, Van Niekerk, Jewkes, Suffla, & Ratele, 2009). South Africa's homicide rate is more than seven times the global average (Ward et al., 2012). This represents a serious social and health burden. Establishing ways to prevent the development of violent behaviour is of utmost importance. The current study is based on findings, largely produced in High Income Countries (HICs), indicating that aggression in young children is a significant predictor of violence perpetration (Broidy et al., 2003), and that such early child aggression is itself associated with harsh, coercive parenting (Jaffee, Strait, & Odgers, 2012). The current study examined whether this association held in the context of a high-risk South African community. Establishing the nature of such a relationship in this context is important, as it could inform targets for both preventive parenting interventions and treatment programmes.

Longitudinal studies show that aggressive children are at high risk of antisocial behaviour and violence in adolescence and adulthood (Broidy et al., 2003; Nagin & Tremblay, 1999), behaviours that carry significant social and financial costs (Waller et al., 2015). The cost to society of children with conduct disorder is estimated to be ten-fold that of children without such disorder (Gardner, Burton, & Klimes, 2006). Notably, interventions directed at aggressive behaviour are more effective with younger children than when problems have become established (Tremblay, 2008). Identifying early risk factors for aggression and intervening early may, therefore, be especially cost effective. Such interventions may require only basic expertise for their delivery - of particular importance in under-resourced low and middle income countries (LMICs) such as South Africa (Flisher et al., 2012; Patel, Flisher, Nikapota, & Malhotra, 2008).

One critical issue related to the development of aggression is the role of parenting, particularly harsh, coercive discipline. This discipline style includes both physical punishment and strong verbal discipline, particularly when hostile or critical (Jaffee et al., 2012; Scott, Doolan, Beckett, Harry, & Cartwright, 2012). The research indicates that harsh parenting predicts the development of aggression in young children as well as aggression and anti-social behaviour later in childhood, adolescence and adulthood (Scott et al., 2012; Tremblay et al., 2004; for reviews, see Gershoff, 2002; Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012; Jaffee et al., 2012; Murray, Anselmi, Gallo, Fleitlich-Biylk, & Bordin, 2013). For example, Scott et al. (2012) found, in a sample of UK families, that seven-

year-old children in the top quarter of parental harsh discipline use had twice the rate of severe behavioural problems as other children. Similarly, in a longitudinal Canadian study, Tremblay et al. (2004) established a significant association between harsh/coercive parenting of infants and physical aggression in the children twelve months later. Evidence from older children supports the same conclusion. In a Brazilian study, parental verbal aggression towards seven-year-olds predicted conduct problems in children three years later, even after controlling for socio-demographic factors and violence in the home and community (de Assis, de Oliveira, de Oliveira Pires, Avanci, & Pesce, 2013). Notably, a survey of caregivers of 6-18 year-olds in a South African township revealed that corporal punishment was widespread and significantly associated with both internalising and externalising problems (Ward, Gould, Kelly, & Mauff, 2015).

Positive parenting strategies, conversely, have been shown to predict *low* levels of aggression in childhood and later life (Knerr, Gardner, & Cluver, 2013). Thus, children are less likely to be aggressive in families where parenting is warm and discipline is consistent and not harsh (Ward et al., 2012; Ward et al. 2015), and this association holds across development (Knerr et al., 2013). Further, parenting programs that reduce harsh discipline and promote positive strategies reduce or prevent children's antisocial behaviour (Jaffee et al, 2012). For example, in a UK at-risk preschool sample, the Incredible Years parenting programme reduced child conduct problems (Gardner, Hutchings, Bywater, & Whitaker, 2010). In sum, extensive research has shown that harsh, coercive parenting is associated with aggressive behaviour in young children and predictive of later aggression and antisocial behaviour, that positive parenting is associated with low rates of these problems, and that parenting interventions reduce the rate of child disturbance.

Although the direction of effects from harsh parenting to child aggression has been emphasised, some research has supported the hypothesis of 'reverse causation' - that is, children whose parents discipline them harshly may be aggressive or oppositional for reasons other than parenting, such as genetic or temperamental factors, and such children may *elicit* harsh parenting (Jaffee et al., 2012). Indeed, Kochanska and Aksan (1995) observed this in interactions between parents and children in observational assessments aimed to replicate everyday situations. Nevertheless, in line with intervention studies, Bor and Sanders (2004) cite research showing strong relationships between changes in parental discipline and changes in antisocial behaviour outcomes, supporting a causal link between harsh discipline and child antisocial behaviour. Taking these findings together, it is highly likely that there are reciprocal effects of harsh parental discipline and child aggression. Nevertheless, even if

child characteristics do play a role, harsh discipline still increases the likelihood of problematic outcomes such as aggressive or antisocial behaviour (Ward et al., 2015). Further, positive parental discipline strategies are likely to prevent the development or maintenance of such adverse outcomes (Jaffee et al., 2012).

One prominent issue in accounting for the development of child aggression has been the significance of child gender. It has been hypothesised that child gender may have an impact on both the development of behavioural problems and the use of harsh discipline. Findings are, however, mixed. While Tremblay et al. (2004) found that significant physical aggression was more prevalent in boys than girls, in a meta-analysis of Brazilian studies, Murray et al. (2013) found no difference in rates of conduct problems attributable to sex differences. Concerning the use of harsh discipline, Bor and Sanders (2004) found that mothers reported more harsh, coercive parenting if their child was a boy. Straus and Stewart (1999) also found that parents reported higher rates of the use of harsh physical discipline (e.g. hitting) towards boys than girls. On the other hand, Gershoff (2002), in her meta-analytic review, found mixed results for the relationship between harsh physical discipline and child gender. Thus, research in this area is inconclusive, and further evidence is required. Almost all violent crime in South Africa is committed by men (Seedat et al. 2009), however, given Murray et al.'s (2013) finding of no gender difference in conduct problems in children, further research which takes account of gender in LMICs may be especially important.

Two further gaps in the literature need to be addressed. Many of the studies outlined above are based on parents' reports of discipline and child behaviour (de Assis et al., 2010; Hou et al., 2013; Scott et al., 2010; Tremblay et al., 2004; Ward et al., 2015). This constitutes a potential weakness because, due to social desirability, parents may under-report both harsh discipline and child behavioural problems. Observational methods may be more valid in establishing both harshness of discipline and severity of child aggression. Indeed, observational measures of parenting have been found to be stronger predictors of child outcome than self-report measures (Gardner, 2000). Few studies have included such observational measures (exceptions being: Baker-Henningham et al., 2012; Gardner et al., 2006; Gardner et al., 2010; Halligan, Cooper, Fearon, Wheeler, Crosby, & Murray, 2013; Waller et al., 2015).

A final notable gap in the literature is that research on the relationship between parenting and aggression is dominated by findings from HICs, with only one of the observational studies having been conducted in a LMIC context (Baker-Henningham et al., 2012). The reliance on HIC research, and on self-report measures, could lead to erroneous

conclusions about the role of parenting in LMIC contexts. Indeed, it is salutary that Lansford et al. (2005) found, in a cross-cultural comparison study including HICs and LMICs, that in the LMICs, where maternal physical discipline was normative, such discipline was less strongly associated with adverse child outcomes than in HICs. To understand the relationship between parenting and child behaviour in South Africa, it is necessary that observational research be conducted.

In summary, aggression in young children has been shown to predict the development of violence and anti-social behaviour. Parental discipline strategies have been found to be strongly related to child aggression. Interventions directed at parenting have been shown to be effective at reducing children's aggression. However, most of the literature on which these conclusions are based comes from HICs. Further, studies using observational measures are rare in LMICs. The relationship between discipline strategies and child responses in South Africa may differ from that which obtains in HIC context. If it were established in rigorous research that harsh and coercive parenting is associated with aggression in young children in South Africa, this would provide a compelling impetus for the introduction of parenting interventions.

Rationale

This study addressed the notable gaps in the literature on the relationship between parenting and child aggression. First, this study investigated the relationship between parental discipline and young children's aggression in a LMIC context (i.e. South Africa), and also explored the role of child gender. Second, this investigation assessed parenting and child behaviour using both parental reports and observational measures. The broad aim was to establish whether harsh discipline is associated with children's aggression in a context where harsh discipline may be normative. Several studies have grouped defiance/non-compliance and aggression together as part of the same externalizing behaviour construct (Crockenberg & Litman, 1990; NICHD, 1998; Rothbaum & Weisz, 1994), and this practice will be followed for this study.

Aims and Hypotheses

The primary aims of this study were to establish, in a LMIC sample of 23-28 month-old children:

1. the relationship between carer discipline strategies and child aggression/defiance;

2. the role of gender in parenting and child defiance, and whether any relationships found between parental discipline and child behaviour problems were moderated by child gender.

Three secondary aims were to investigate:

1. the relationship between self-reported parenting and observed parenting;
2. the relationship between carer reports of child behaviour problems and observed child behaviour;
3. in exploratory analyses, the direction of effects between carer and child behaviour.

The hypotheses were:

1. Harsh/coercive carer discipline is associated with higher levels of child aggression/defiance;
2. Positive carer guidance is associated with lower levels of child aggression/defiance.

No predictions were made concerning the association between child gender and both parenting and child outcome, nor on the influence of child gender in the relationship between carer discipline and child aggression.

Method

Design and setting

This project capitalised on a randomised controlled trial (RCT) investigating the effects of a book-sharing parenting intervention on child cognitive and socio-emotional development (<http://www.isrctn.com/ISRCTN71109104>). The intervention and associated assessments have taken place at a research unit in Khayelitsha, a peri-urban township in Cape Town.

The current research employed a quantitative correlational design. It used base-line data collected for the RCT, in which observations were made and carer-report data collected on parenting and child aggression/defiance.

Participants

The sample comprised 70 Black isiXhosa speaking carers and their young children. Participants were recruited from Ndlovini and Makaza, low-SES communities in Khayelitsha, on an opportunistic basis. Researchers went door-to-door in the neighbourhood,

and all those eligible were invited to take part in the study. The data used for the current study derive from the baseline assessment for the first half of the participants recruited into the main RCT ($N = 70$).

The inclusion criteria were that the adult was the primary care-giver of the child and the child was 22-28 months old at base-line. Potential participants were excluded if the caregiver or the child was suffering from a chronic illness that could prevent them from participating fully in the study.

After assessments had been conducted, one child was found to have cerebral palsy and was excluded from the study. Furthermore, for two participants on one of the two observations tasks (see ‘Measures’ below), the video recording did not capture sound, and so these two assessments were excluded from the analyses. The final sample size for the two observational assessments was 67 and 69.

Sample size calculation

A power calculation was conducted to confirm that the sample was adequate for the necessary analyses. Initially, an estimate was made from the literature of the effect size for the association between harsh coercive parenting and child conduct problems. This was calculated from two studies (Chen, Zhou, Eisenberg, Valiente, & Wang, 2011; Nelson, Coyne, Swanson, Hart, & Olsen, 2014). This produced an average effect size of $d = 0.38$. This was entered into the G*Power 3.1 programme and, with an alpha at 0.05 and a beta of 0.90, with eight predictors (three self-reported, four observed measures of parenting, and child gender) a sample of 59 is required to demonstrate a significant association. The current samples of 67 and 69, therefore are adequate.

Procedure

Assessments took place at a research unit in Khayelitsha and were conducted in isiXhosa by a trained assessor from the Khayelitsha community. Initially, the caregiver completed a series of questionnaires (see ‘Measures’); and a demographic interview was conducted (see Table 1). Following this, the caregiver and child participated in a “Don’t touch” prohibition task (DTT), and a “Clean up” compliance task (CUT) (see ‘Measures’), as well as other assessments not included in the current study. The tasks were video-recorded, and these videos were coded, blind to all other data, to address the aims of the current project. Participants received a R120 Shoprite voucher for attending the full, two-to-three hour assessment session.

Ethical considerations

The parenting intervention study from which the data for the current study are derived was approved by The University of Stellenbosch Health Research Ethics Committee, (N15/09/804 - see Appendix A). Informed consent was obtained from participant caregivers. The consent form outlined the purpose, procedure and requirements of the study (see Appendix B for English version). A research team member read the form aloud, with the participants reading along if they wished. Participants' questions were answered by the assessor. Participants were assured that participation in the study was completely voluntary, and that they were free to stop participating at any point if they wished. Confidentiality and anonymity were assured. Participants received an identification number, not linked to their names, for use in any subsequent forms or analyses.

Measures

Carer-report measures.

Child aggression. The caregiver was interviewed using the Aggression Scale of the Child Behavior Checklist (CBCL) for ages 1 ½ - 5 years (Achenbach, McConaughy, & Howell, 1987) (Appendix C). This scale, as with the other CBCL scales, reflects patterns of problem behaviours derived from factor analysis. There are 19 items, each rated on a 3 point Likert scale: 'very true or often true' of the child, 'somewhat or sometimes true', and 'not true' (scored 2, 1 and 0, respectively). A 3 point scale is particularly appropriate for the current study given its clarity and simplicity, which may be important in a low SES population in which participants could have low levels of education. An aggregate score can be used as an interval scale variable. A cut-off can also be applied to define a level of clinical disturbance (Achenbach & Ruffle, 2000), and this is useful for examining the relationship between parenting variables and clinically problematic child behaviour. Studies have consistently found moderate to high levels of reliability and good discriminant and concurrent validity for the CBCL sub-scales (Nakamura, Ebesutani, Bernstein & Choprita, 2009; Lowe, 1998).

Previous work suggests that, where variability within the normal range is not of concern, as in the current study, it is more clinically relevant to use the clinical cut-off to define child problem behaviour than the continuous variable, (Farrington & Loeber, 2000). Therefore, it was decided to use only a binary CBCL reported child aggression/defiance variable: a score in the clinical range (aggregate score >24) versus a score below the clinical range (score <25).

Parenting. Parenting was assessed using the Discipline and Violence self-report questionnaire (Lansford & Deater-Deckard, 2012) (see Appendix D), which includes 11 items of discipline practice (including violent ones). It covers a range of discipline practices shown in a 24-country comparative study to vary widely in prevalence across countries (Lansford & Deater-Deckard, 2012). For the current study, this assessment was administered as an interview. Indices of harsh physical discipline, psychologically/verbal aggressive discipline, and non-violent discipline were derived by aggregating appropriate items, following Lansford and Deater-Deckard (2012) (see Appendix D). This measure has been translated into isiXhosa and is currently being used in research studies in South African communities (e.g. the Philani home visiting project - www.preventionresearch.org.za/philani/).

Observational measures.

Two parent-child interaction assessments were made and video-recorded for subsequent coding.

1. The “Don’t touch” – prohibition task (DTT). This involved the carer being instructed to prohibit the child from touching a set of attractive toys for 140 seconds (see Appendix E for details).
2. The “Clean-up” – compliance task (CUT). Following a period of free-play after DTT, the carer was instructed to get the child to pack away the set of toys for a period up to 120 seconds (see Appendix E for details).

Scoring and Coding

Child aggression/defiance, together with the dimensions of carer behaviour, were coded from the videos of DTT and CUT. Operational definitions of these behaviours were developed from examination of previous research that used the two tasks to assess parental discipline and child aggression/defiance. This research has shown that coding these behaviours from the tasks can be achieved with a high degree of inter-rater reliability (Crockenberg & Litman, 1990; Kochanska, 1995; Kochanska & Aksan, 1995; Kochanska, Aksan, & Koenig, 1995; Pereira, Negrao, Soares, & Mesman, 2014; Yagmur, Mesman, Malda, Bakermans-Kranenburg, & Ekmekci, 2014). It has also demonstrated validity in that the key parenting dimensions have been found to predict the key child behaviour dimensions (Kochanska & Aksan, 1995).

Following establishment of a final coding scheme, based on previous coding systems and viewing six randomly sampled videos, a random 20% sample of video recordings were independently coded by the author and a second coder to establish inter-rater reliability (see ‘Inter-rater reliability’). A summary of the coding scheme follows (details in Appendix F).

A. Child dimensions.

Defiance/Non-Compliance. This dimension was developed based on the coding scheme used by Crockenberg and Litman (1990), and Kochanska and colleagues (Kochanska, 1995; Kochanska & Aksan, 1995; Kochanska, Aksan, & Koenig, 1995) and used in other studies (e.g., Pereira et al. 2014; Yagmur et al. 2014). For both DTT and the CUT, each 20 second time block was coded for the predominant behaviour shown, using the six comprehensive, mutually exclusive, behaviour categories employed in the literature – namely ‘Strong Defiance’, ‘Moderate Defiance’, ‘Non-aversive Refusal’, ‘Passive non-compliance’, ‘Situational compliance’, and ‘Committed compliance’. In order to create a single variable reflecting the degree of defiance/non-compliance expressed, each of these categories was assigned a scaled value, as follows: (a) Strong Defiance = 5, (b) Moderate Defiance = 4, (c) Non-aversive Refusal = 3, (d) Passive non-compliance = 2, (e) Situational compliance = 1, (f) Committed compliance = 0.

The aggregated values for each task, divided by the number of time blocks, provided a scale score for each task.

B. Carer.

Control. This dimension was developed based on coding schemes used by Crockenberg and Litman (1990) and Kochanska and colleagues (Kochanska, 1995; Kochanska, 1997; Kochanska & Aksan, 1995), and also used by Pereira and colleagues (2014). For both DTT and CUT, carer behaviour was rated using four behaviour categories (two negative, two positive), for each 20 second time block. Behaviour categories comprised (a) Physical negative control/harsh discipline; b) Verbal negative control/harsh discipline (c) Physical Guidance; and (d) Verbal Guidance. Scores for behaviours (a), (c), and (d) were averaged to represent the extent to which each strategy was used for each of the ‘Don’t touch and ‘Clean up’ tasks separately. An event-based count of verbal negative control/harsh discipline was used. In the literature cited, behaviour categories comprise two dimensions, guidance/gentle control (including physical and verbal), and negative discipline (including physical and verbal). However, because of the emphasis on harsh physical discipline in the

aggression literature, and the discussion of other dimensions of discipline as distinct (e.g. verbally aggressive parenting (de Assis et al., 2013)), it was decided to separate the categories into four, as described.

Inter-rater reliability

A random 20% of assessments were selected and coded by the author and another independent coder. There was very high inter-rater reliability, with all values falling within the “excellent” range (Cicchetti, 1994) (see Appendix G for details).

Data Analysis

The data were analysed using the IBM SPSS Statistics for Windows (version 21.0) and Stata (version 14). Descriptive statistics were obtained for all independent and dependent variables. To address Aim 1 (i.e. ‘To establish the relationship between parental discipline strategies and child aggression/defiance’), first, correlation matrices were obtained. Then, to discern the independent associations of parenting variables in predicting child aggression/defiance, a series of regressions were run (for the types of regressions, see ‘Results’). To address Aim 2 (i.e. “To establish the role of gender in parenting and child defiance, and whether any relationships found between parental discipline and child behaviour problems were moderated by child gender”), correlations between gender and both harsh physical discipline and child aggression/defiance were examined. The moderating impact of gender on the relationship between harsh physical discipline and child aggression/defiance was also investigated. For the latter analysis, regressions were run with observed and reported child aggression/defiance as the dependent variable, and the main effects and interaction of gender and harsh physical discipline. To address the first secondary aim (i.e. ‘To establish the relationship between self-reported parenting and observed parenting’), correlation matrices were examined. To address the second secondary aim (i.e. ‘To establish the relationship between carer reports of child behaviour problems and observed child behaviour’), the CBCL’s ability (as a binary variable) to identify observed disturbance was examined. For each task, contingency tables were produced and sensitivity, specificity, and positive and negative predictive values calculated. To address the final secondary aim (i.e., “To investigate the direction of effects in the relationship between carer and child behaviour”), regression analyses were run across time and across tasks. For all analyses, significance was set at $p < .05$.

Results

Sample Characteristics

Demographic characteristics are shown in Table 1. There were somewhat more boys than girls, all aged 22-28 months. All but one of the caregivers were women, ranging from 18-63 years. Most had completed Grades 10-12/Matric. Almost two-thirds were either married or cohabiting. Almost three-quarters reported living in an informal dwelling/shack in an informal settlement, with the number of people in the household ranging from 2-14. Monthly income was R2,001-R5,000 for most of the sample.

Table 1:
Demographic Characteristics of the Sample (N=69)

Variable	Frequency (n)	Percent (%)
Gender		
Boy	40	58.0
Girl	29	42.0
Caregiver education		
Grade 6/ Std 4	1	1.4
Grade 7/ Std 5	3	4.3
Grade 8/ Std 6	4	5.8
Grade 9/ Std 7	5	7.2
Grade 10/ Std 8	14	20.3
Grade 11/ Std 9	26	37.7
Grade 12/ Matric	13	18.8
Post Matric Certificate/ Diploma	3	4.3
Marital Status		
Single	22	31.9
Married	37	53.6
Not Married But Living Together	10	14.5
Housing Description		
Formal brick structure separate	12	17.4
Informal dwelling/ Shack in backyard	6	8.7
Informal dwelling/ Shack in informal settlement	51	73.9
Number of Household Members		
2.00	1	1.4
3.00	11	15.9
4.00	22	31.9
5.00	10	14.5
6.00	9	13.0
7.00	11	15.9
8.00	2	2.9
9.00+	3	4.2
Household monthly income		
R0-1,000	2	2.8
R1,001-2,000	8	11.6
R2,001-5,000	41	59.4
R5,001-8,000	8	11.6
R8,000+	4	5.8
Don't know	6	8.7

Distributions of Parenting Variables

Distributions of the parenting variables are presented in Appendix H. Since regression analyses are robust to the assumption of normality violation in independent variables, most were left unchanged, even if they were skewed. However, one variable, Observed Harsh Verbal Discipline, which was scored as an event-based count, was very skewed for both tasks: in almost all cases, there were no instances of harsh verbal discipline (for DTT, 78.3% scored 0, and for CUT, 82.1% scored 0). It was determined, based on viewing a sub-sample of the videos of these assessments, that it would sufficiently capture the nature of the verbal discipline in the interactions if the Observed Harsh Verbal Discipline variable were treated as a binary variable – i.e. presence or absence of harsh verbal discipline at any point in each task.

Distributions of Outcome Variables

Observed Child Defiance.

DTT: As a continuous variable, Observed Child Defiance was highly negatively skewed (0.93; see Appendix H). While predictor variables in regression analyses are robust to violations of normality, outcome variables are not (Field, 2013), and distributions of the residuals of the outcome variables were therefore examined by obtaining Normal P-P Plots and Scatterplots of Regression Standardized Residuals to determine whether any needed to be changed.

DTT Observed Child Defiance:

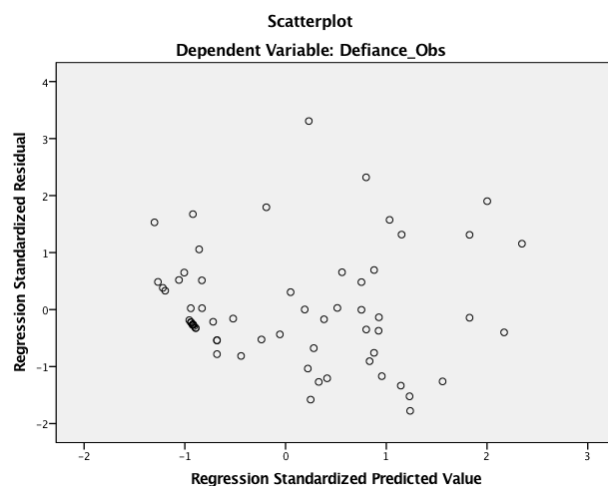
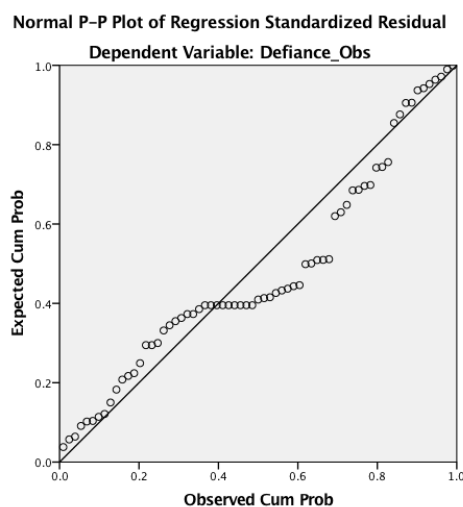


Figure 1: *Normal P-P Plot of Regression Standardized Residuals*

Figure 2: *Scatter Plot of Regression Standardized Residuals*

As can be seen from Figures 1 and 2, there was a high degree of heteroscedasticity in the residuals of the outcome variable in DTT. Applying a log transformation (Field, 2013) to the variable did not adequately normalise the distribution of the residuals. Thus, linear regression was not appropriate for these data. The possibility of transforming the outcome variables into a three-level ordinal variable was explored. Since this study aimed to compare relationships across the two assessment tasks, this finding of non-normality meant that the outcome variable for CUT would have to be similarly transformed. The three levels were:

Level 1: Complete compliance – 0 (Committed compliance)

Level 2: Some or mostly compliant – 1 (Situational compliance) and 2 (Passive non-compliance)

Level 3: Defiance – 3 (Refusal, non-aversive), 4 (Moderate defiance), and 5 (Strong defiance)

The distributions of the outcome variables for each task are shown in Appendix H.

The type of regression most appropriate for these ordinal observed defiance outcome variables is “Ordinal regression” (Winship & Mare, 1984). As observed defiance was now a 3-level ordinal variable, neither multiple-regression nor binary logistic regression was appropriate. Multinomial logistic regression was also not appropriate because it assumes that the categories of the outcome variable are nominal (i.e. there is no order), whereas the observed child defiance variable for the two tasks did maintain a meaningful order.

CBCL Reported Child Aggression/Defiance.

For the carer-reported outcome of child aggression/defiance, 22.4% in DTT and 23.2% in CUT were above the CBCL clinical threshold. Binary logistic regression was used in predicting this outcome (Field, 2013). Means and standard deviations of all observed and carer report variables are shown in Appendix I.

Aim 1: Relationship Between Parenting Variables and Child Aggression/Defiance

To address this aim, first, correlations were run between the parenting variables and the child outcomes for each of the two observational tasks, and the carer-reported child outcome (See Tables 2 and 3). For correlations between two variables in which one or more of the variables was ordinal (i.e. Observed Child Defiance for DTT and for CUT), Kendall’s tau correlational analysis was used (Khamis, 2008). In the case of a binary variable correlated

with a continuous variable, the table reports Pearson's r because it is equivalent to a point-biserial correlation (Field, 2013); and for a binary variable correlated with another binary variable, Pearson's r is also reported because it is equivalent to phi (MacCallum, Zhang, Preacher, & Rucker, 2002).

Table 2:

DTT correlations (N=67)

		Observed Child Defiance ^a	Reported Child Aggression – cut off	Observed Harsh Physical	Observed Physical Guidance	Observed Verbal Guidance	Observed Harsh Verbal	Observed Harsh Verbal - Binary	Reported Physically Violent	Reported Psychologically Aggressive	Reported Non-Violent	Gender ^b
Reported Child Aggression – cut off	Pearson Correlation	.159										
	Sig. (2-tailed)	.178										
Observed Harsh Physical	Pearson Correlation	.702**	.170									
	Sig. (2-tailed)	.000	.169									
Observed Physical Guidance	Pearson Correlation	.171	.060	.199								
	Sig. (2-tailed)	.108	.627	.106								
Observed Verbal Guidance	Pearson Correlation	.215*	-.126	.177	.389**							
	Sig. (2-tailed)	.036	.308	.152	.001							
Observed Harsh Verbal	Pearson Correlation	.400**	.193	.420**	.143	.121						
	Sig. (2-tailed)	.000	.118	.000	.250	.329						
Observed Harsh Verbal – Binary	Pearson Correlation	.393**	.280*	.418**	.189	.204	.751**					
	Sig. (2-tailed)	.001	.022	.000	.127	.098	.000					
Reported Physically Violent	Pearson Correlation	.104	.124	.179	-.082	-.104	-.062	.031				
	Sig. (2-tailed)	.341	.316	.148	.510	.402	.620	.805				
Reported Psychologically Aggressive	Pearson Correlation	.095	.281*	.270*	.086	.091	.025	.038	.330**			
	Sig. (2-tailed)	.416	.021	.027	.487	.465	.844	.761	.006			
Reported Non-Violent	Pearson Correlation	-.086	-.102	.055	.181	.299*	-.205	-.267*	.105	.201		
	Sig. (2-tailed)	.446	.411	.658	.143	.014	.097	.029	.399	.104		
Gender ^b	Pearson Correlation	-.241*	-.149	-.254*	.076	.007	-.233	-.249	-.183	-.075	.074	
	Sig. (2-tailed)	.041	.228	.038	.539	.953	.058	.042	.138	.544	.553	
Observed Child Defiance (Clean up) ^a	Correlation coefficient	.330**	-.068	.230*	-.008	.058	.095	.098	.205	.048	-.056	-.281*
	Sig. (2-tailed)	.004	.565	.026	.941	.573	.404	.411	.062	.685	.617	.018

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

a. Kendall’s tau b

b. Boys = 0, Girls = 1

Table 2 shows the correlation matrix for the parenting and child variables for DTT. The observed outcome variable, Observed Child Defiance, was significantly correlated with three of the observed parenting variables. Two of these were Harsh Physical Discipline ($\tau = .70, p < .001$), and Harsh Verbal Discipline ($\tau = 0.39, p < .001$), indicating that higher levels of physical and verbal parental discipline were associated with higher levels of child defiance. Observed Child defiance was also, unexpectedly, significantly associated with more Verbal Guidance ($\tau = .22, p = .038$), but not with any of the reported parenting variables. Gender (0= Boy, 1= Girl) was significantly associated with Observed Child Defiance ($\tau = -.24, p = .041$) (i.e., boys were more aggressive/defiant), but not with the CBCL carer-reported child aggression/defiance. The parental report outcome variable of CBCL aggression/defiance was significantly associated with Observed Harsh Verbal Discipline ($r = .28, p = .02$) and with carer-report Psychologically Aggressive Discipline ($r = .28, p = .02$).

Table 3:
CUT Correlations (N=69)

		Observed Child Defiance ^a	Reported Child Aggression (Binary)	Observed Harsh Physical	Observed Physical Guidance	Observed Verbal Guidance	Observed Harsh Verbal	Observed Harsh Verbal - Binary	Reported Physical Violence	Reported Psychologically Aggressive	Reported Non-Violent	Gender ^b
Reported Child Aggression (Binary)	Pearson Correlation	-.062										
	Sig. (2-tailed)	.595										
Observed Harsh Physical	Pearson Correlation	.493**	-.170									
	Sig. (2-tailed)	.000	.162									
Observed Physical Guidance	Pearson Correlation	-.359**	-.241*	-.379**								
	Sig. (2-tailed)	.000	.046	.001								
Observed Verbal Guidance	Pearson Correlation	-.223*	-.258*	-.239*	.495**							
	Sig. (2-tailed)	.024	.032	.048	.000							
Observed Harsh Verbal	Pearson Correlation	.308**	.163	.087	-.179	-.090						
	Sig. (2-tailed)	.007	.180	.475	.141	.460						
Observed Harsh Verbal - Binary	Pearson Correlation	.336**	.064	.258*	-.201	-.142	.779**					
	Sig. (2-tailed)	.004	.599	.032	.098	.246	.000					
Reported Physical Violence	Pearson Correlation	.207	.166	.191	-.114	-.171	.273*	.242*				
	Sig. (2-tailed)	.054	.172	.116	.353	.160	.023	.045				
Reported Psychologically Aggressive	Pearson Correlation	.051	.340**	-.086	.065	-.035	.354**	.196	.384**			
	Sig. (2-tailed)	.657	.004	.481	.598	.772	.003	.107	.001			
Reported Non-Violent	Pearson Correlation	-.060	-.092	-.081	.015	.471**	.076	-.009	.087	.187		
	Sig. (2-tailed)	.589	.454	.506	.903	.000	.538	.943	.476	.124		
Gender ^b	Pearson Correlation	-.268*	-.120	-.293*	.233	.141	-.099	-.211	-.129	-.022	.048	
	Sig. (2-tailed)	.022	.326	.015	.054	.249	.420	.082	.290	.857	.693	
Observed Child Defiance (Don't touch) ^a	Correlation Coefficient	.330**	.159	.158	-.268**	-.081	.341**	.333**	.104	.095	-.086	-.241*
	Sig. (2-tailed)	.004	.178	.135	.008	.418	.003	.005	.341	.416	.446	.041

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

a. Kendall's tau b

b. Boys = 0, Girls = 1

As can be seen from Table 3, Observed Child Defiance was significantly correlated with all the observed parenting variables (CUT). It was positively correlated with Observed Harsh Physical Discipline ($\tau = .49, p < .001$), and Observed Harsh Verbal Discipline ($\tau = .34, p = .004$), indicating that higher levels of harsh physical and verbal parental discipline are associated with higher levels of child aggression/defiance. Further, Observed Child Defiance was significantly negatively correlated with Observed Physical Guidance ($\tau = -.36, p < .001$), and Observed Verbal Guidance ($\tau = -.22, p = .024$), indicating that higher levels of physical and verbal guidance were associated with lower levels of child aggression/defiance. Gender was significantly associated with Observed Child Defiance ($\tau = -.27, p = .022$) (i.e. boys were more aggressive/defiant), but not with CBCL carer-reported child aggression/defiance. Reported CBCL Aggression was significantly negatively correlated with Observed Physical Guidance ($r = -.24, p = .046$) and Observed Verbal Guidance ($r = -.26, p = .032$), and positively correlated with Reported Psychologically Aggressive Discipline ($r = .34, p = .004$) (in instances where reported parental and reported child variables were jointly examined, stats were based on the full sample, $N=69$).

Since parenting variables that were significantly associated with child defiance were also related to each other (e.g. Observed Harsh Physical and Verbal Discipline in both tasks; Observed Physical and Verbal Guidance for the 'Clean Up' task), it is not possible to discern from the correlation matrices their independent associations with child defiance. Thus, a series of regression analyses were conducted to examine the extent of the variance in child defiance that was explained by each of the parenting variables, taking account of the contribution of the others. Child gender was included in all of these models, to examine whether there was a main effect of gender, and also to investigate the effect of the parenting variables while controlling for gender. By running exploratory models, it was determined that there was no multicollinearity between key variables (all Tolerance Statistics > 0.56 ; all VIF Statistics < 2.54). For models which utilised binary logistic regression, analyses were run to test for the linearity of the logit of continuous predictor variables. The results of the analyses showed that the assumption was upheld (all p values $> .076$).

“Don’t touch” task.

Model 1.

An Ordered Logistic Regression was conducted. The predictor variables were all four Observed parenting variables and child gender, and the outcome variable was Observed Child Defiance. The outcome is shown in Table 4.

The assumption of proportional odds was violated, as the test of parallel lines was significant ($p=.001$). Therefore, the partial proportional odds method (Williams, 2006) was used to compensate for variables in the model that violated this assumption. This was done using Stata version 14. The effects of Gender and Verbal Guidance were found to violate the assumption of parallel lines, and their effect was therefore left unconstrained in the model. The overall model was statistically significant ($\chi^2(7) = 79.16, p < .001$), and the Pseudo R^2 estimation was 0.63, indicating that the variables in the model explained approximately 63% of the variance in Observed Child Defiance. Observed Harsh Physical Discipline was individually significant ($b = 9.44, SE = 2.72, 95\% CI = 4.11-14.77, p = .001$), indicating that higher levels of harsh physical discipline were associated with higher levels of child defiance. Verbal Guidance was also found to have a significant effect, but only in the contrast between children with the highest degree of defiance, and the remaining children ($b = -2.64, SE = 1.24, 95\% CI = -5.08 - -0.20, p = .034$): higher Verbal Guidance decreased the likelihood of being in the former group of children.

Table 4:

Prediction of observed child aggression/defiance by observed parenting in DTT

	Estimate	S.E.	z	Sig.	95%CI	
					Lower Bound	Upper Bound
Intercept	-0.72	0.64	-1.12	.262	-1.97	0.53
0 Observed Verbal Guidance	0.69	0.50	1.37	.170	-0.30	1.68
Gender	-1.52	0.92	-1.66	.097	-3.32	0.27
Intercept	-13.29	3.97	-3.35	.001	-21.06	-5.51
1 Observed Verbal Guidance	-2.64	1.24	-2.12	.034	-5.08	-0.20
Gender	3.44	1.77	1.95	.051	-0.02	6.91
Observed Harsh Physical Discipline	9.44	2.72	3.47	.001	4.11	14.77
Observed Harsh Verbal Discipline	2.37	1.60	1.48	.138	-0.76	5.51
Observed Physical Guidance	0.42	1.75	0.24	.809	-3.01	3.85

The other parenting variables were not statistically significant predictors of Child Defiance, and neither was child gender. Thus, it can be concluded that, in the “Don’t touch” task, parenting strategies significantly predicted child defiance, and that harsh physical discipline and verbal guidance were the only specific parenting styles that were statistically significant predictors. To determine the contribution of Observed Harsh Physical Discipline, another regression was run without this variable in the model; and then, the McFadden’s

Pseudo R-Square found in the second model was subtracted from the first (0.63) to give a Delta R^2 value. The R^2 in the second model was 0.18; and the Delta R^2 value was therefore 0.45. This means that Observed Harsh Physical Discipline accounted for approximately 45% of the variance in Observed Child Defiance. The Delta R^2 for Observed Verbal Guidance was 0.09, indicating that the variable explained approximately 9% of the variance.

Model 2.

An Ordered Logistic Regression was conducted. The predictor variables were all three self-reported parenting variables and child gender, and the outcome was Observed Child Defiance. The overall model was not significant ($X^2(4) = 7.12, p = .130$); and, further, none of the specific variables, nor gender, significantly predicted Observed Child Defiance.

Model 3.

A Binary Logistic Regression was conducted. The predictor variables were all four Observed parenting variables and child gender, and the outcome was carer-reported CBCL Child Aggression/Defiance. The overall model was not significant ($X^2(5)=9.03, p = .108$); and, further, none of the specific parenting nor gender was individually significant.

“Clean up” task.

Model 4.

An Ordered Logistic Regression was conducted. The predictor variables were all four observed parenting variables and child gender, and the outcome was Observed Child Defiance. The outcome of this analysis is shown in Table 5. The assumption of proportional odds was violated, as the test of parallel lines was significant ($p = .049$). Therefore, the partial proportional odds method (Williams, 2006) was used. The overall model was statistically significant ($X^2(6) = 43.42, p < .001$), and the Pseudo R^2 was 0.36, indicating that the variables in the model explained approximately 36% of the variance in Observed Child Defiance. Observed Harsh Physical Discipline was individually significant ($b = 3.04, SE = 0.91, 95\% CI = 1.26-4.82, p = .001$), indicating that higher levels of harsh physical discipline were associated with higher levels of child defiance. Physical Guidance was also found to have a significant effect, but only in the contrast between children with the highest degree of defiance and the remaining children ($b = -4.32, SE = 2.03, 95\% CI = -8.30 - -0.34, p = .033$): higher Physical Guidance decreased the likelihood of being in the former group of children.

Table 5:

Prediction of observed child aggression/defiance by observed parenting in CUT

	Estimate	S.E.	z	Sig.	95%CI	
					Lower Bound	Upper Bound
0 Intercept	1.02	1.18	0.86	.391	-1.30	3.34
0 Observed Physical Guidance	-0.25	0.52	-0.48	.628	-1.26	0.76
1 Intercept	-1.94	1.38	-1.40	.161	-4.65	0.77
1 Observed Physical Guidance	-4.32	2.03	-2.13	.033	-8.30	-0.34
Observed Harsh Physical Discipline	3.04	0.91	3.35	.001	1.26	4.82
Observed Harsh Verbal Discipline	2.06	1.07	1.92	.055	-0.04	4.17
Observed Verbal Guidance	-0.09	0.45	-0.20	.840	-0.98	0.80
Gender	-2.99	0.62	-0.48	.632	-1.52	0.92

The other parenting variables were not statistically significant in the model, and neither was child gender. Thus, parenting significantly predicted child defiance, and Harsh Physical Discipline and Physical Guidance were individually significant predictors. The Delta R^2 values of these variables were calculated using the same method as in Model 1. The Delta R^2 for Observed Harsh Physical Discipline was 0.14, indicating that the variable explained approximately 14% of the variance in Observed Child Defiance. The Delta R^2 for Observed Physical Guidance was 0.06, indicating that the variable explained approximately 6% of the variance.

Model 5.

An Ordered Logistic Regression was conducted. The predictors were all three Self-Reported parenting variables and child gender, and the outcome was Observed Child Defiance. The overall model was not statistically significant ($X^2(4) = 9.14, p = .058$), and, further, none of the parenting variables in the model was individually significant, although gender was so (Wald $X^2(1) = 3.98, p = .046$).

Model 6.

A Binary Logistic Regression was conducted. The predictors were all four observed parenting variables and child gender, and the outcome was carer-reported CBCL Child Aggression/Defiance. The outcome of this analysis is shown in Table 6.

Table 6:

Prediction of carer-reported child aggression/defiance by observed parenting in CUT

	B	S.E.	Wald	df	Sig.	Exp(B)
Gender	.80	.71	1.29	1	.256	2.231
Observed Harsh Physical	-2.48	1.07	5.38	1	.020	.084
Observed Physical Guidance	-1.12	.61	3.35	1	.067	.327
Observed Verbal Guidance	-.74	.50	2.21	1	.137	.478
Observed Harsh Verbal	.62	.89	.49	1	.484	1.863
Constant	1.50	1.15	1.69	1	.194	4.466

The results from the Omnibus Tests of Model Coefficients revealed that the overall model was statistically significant ($X^2(5) = 15.00, p = .010$). The McFadden Pseudo R^2 was 0.20, indicating that the variables in the model explained approximately 20% of the variance in reported child aggression/defiance. Only one specific observed parenting variable, namely Observed Harsh Physical Discipline, was found to significantly predict the dependent variable (Wald $X^2(1) = 5.375, p = .020$). Using the same equation outlined in Model 1, it was determined that Observed Harsh Physical Discipline explained 3% of the variance in carer-reported child aggression/defiance. The Exp(B) value indicates that for every 1 unit of increase in Harsh Physical Discipline, there is a 16% decrease in the likelihood of the child being in the clinical range of the CBCL.

Carer-report - predictor and outcome.

Model 7.

A Binary Logistic Regression was conducted. The predictor variables were all three self-reported parenting variables and gender, and the outcome was carer-reported CBCL Child Aggression/Defiance. The outcome of this analysis is shown in Table 7.

Table 7:

Prediction of carer-report (CBCL) child aggression/defiance by carer-reported parenting.

	B	S.E.	Wald	df	Sig.	Exp(B)
Reported Physically Violent	.03	.24	.02	1	.902	1.03
Reported Psychologically Aggressive	1.53	.62	6.18	1	.013	4.62
Reported Non-Violent	-.54	.38	2.07	1	.150	.58
Gender	.69	.68	1.03	1	.311	1.98
Constant	-	.67	6.57	1	.010	.18
	1.70					

The results from the Omnibus Tests of Model Coefficients revealed that the overall model was statistically significant ($X^2(4) = 10.30, p = .036$). This indicates that the self-reported parenting variables significantly predicted carer-report CBCL child aggression/defiance. The McFadden Pseudo R^2 was 0.14, indicating that the variables in the model explained approximately 14% of the variance in reported child aggression/defiance. Only the effect of one specific self-reported parenting variable was found to be significant in the model, namely Psychologically Aggressive Discipline ($p = .013$). The Delta R^2 for Psychologically Aggressive Discipline was 0.093, indicating that the variable explained approximately 9.3% of the variance. The Odds Ratio value indicates that for every 1 unit of increase in Psychologically Aggressive Discipline, the child was 4.62 times more likely to be in the clinical range of the CBCL child aggression/defiance variable.

Summary.

Observed parenting strategies significantly predicted observed child defiance. In both tasks, Observed Harsh Physical discipline significantly predicted defiance. In the “Don’t touch” task, higher levels of Observed Verbal Guidance were associated with a lower likelihood of high levels of defiance. In the “Clean up” task, higher levels of Observed Physical Guidance were also associated with a lower likelihood of high levels of defiance. The model with observed parenting variables in the “Clean up” task also significantly predicted carer-reported child aggression/defiance (i.e. on the CBCL); however, within the model, Harsh Physical Discipline was the only significant variable. Unexpectedly, higher levels of Harsh Physical Discipline were associated with a lower likelihood of the child being in the clinical range of reported child aggression/defiance. None of the observed parenting

variables for the “Don’t touch” task was associated with carer-reported child aggression/defiance. None of the self-reported parenting variables significantly predicted observed child defiance for either task. Self-reported Psychologically Aggressive Discipline, however, did significantly predict carer-reported child aggression/defiance, but the other reported parenting variables in the model did not.

Aim 2: Effect of Child Gender

As can be seen from Table 3, gender was not associated with any of the carer-report parenting variables. Gender was, however, significantly associated with Observed Harsh Physical discipline in both DTT ($-0.25, p = .038$) and CUT ($-0.29, p = .015$). In both cases, discipline was more harsh for boys than girls. Gender was also significantly associated with Observed Child Defiance, again with boys showing more of this disturbed behaviour than girls (DTT: $-0.24, p = .041$; CUT: $-0.27, p = .022$).

To examine the moderating impact of gender of the relationship between observed harsh parenting and child aggression/defiance, regression analyses were conducted. The various regression models outlined in Aim 1 were repeated and, by including interaction terms it was examined whether gender moderated the relationship between Observed Harsh Physical Discipline or Reported Physically Violent Discipline and child aggression/defiance. There was no significant moderation effect found in any of the models (See Appendix J).

First Secondary Aim: The Relationship Between Observed and Reported Parenting

A secondary aim was to establish the relationship between the two kinds of measures of the same behaviour- i.e., between self-reported parenting and observed parenting. Three of the observed parenting variables can be regarded as corresponding conceptually to the three reported parenting variables: Observed Harsh Physical Discipline with Reported Physically Violent Discipline; Observed Harsh Verbal Discipline with Reported Psychologically Aggressive Discipline; and Observed Verbal Guidance with Non-Violent Reported Discipline. Further, Observed Verbal Guidance can be seen as the converse of Reported Psychologically Aggressive Discipline; and Observed Harsh Verbal Discipline the converse of Reported Non-Violent Discipline.

The significant relationships between the observed variables in DTT and their reported counter-parts are shown in Table 2. It can be seen that the significant associations were between Observed Verbal Guidance and Reported Non-Violent Discipline ($r = .30, p = .014$); and between Observed Harsh Verbal Discipline and Reported Non-Violent Discipline

($r = -.27, p = .029$). There were no other significant associations. It can be concluded that those who *reported* using non-violent discipline strategies were also *observed* as using higher rates of verbal guidance and lower rates of harsh verbal discipline. However what participants *reported* about their use of physically violent discipline and psychologically aggressive discipline did *not* correspond to what was observed (all other p values $> .15$).

The relationship between the observed parenting variables and their reported counterparts were also examined for CUT (see Table 3). Only one significant association was found: Observed Verbal Guidance was significantly positively correlated with Reported Non-Violent Discipline ($.47, p < .001$) (all other p values $> .11$). This indicates that people's reported use of non-violent discipline strategies is reflected in their observed parenting. However, reported *negative* strategies were not significantly associated with the observed parenting variables.

Second Secondary Aim: The Relationship Between Carer Reports of Child Behaviour Problems and Observed Child Behaviour

The second secondary aim was to determine whether there was a relationship between observed child behaviour problems and carer reported behaviour problems. For each of the tasks, correlations between observed child defiance and the CBCL aggression/defiance variable were examined. As can be see from Table 8 and 9, reported and observed child behaviour problems were not significantly correlated for either task.

To examine further the association between the observed child behaviour data and the mothers' CBCL reports, the observed data were dichotomized. A stringent criterion was applied by collapsing the ratings of 0 and 1 for 'observed defiance' into a single rating of 'no disturbance'. (This is justified by the fact that level '2' of Observed Child Defiance captured ratings of '3', '4', and '5' of the original observed child defiance variable, and it was these three ratings that were, definitionally, those of 'active defiance or aggression'). If one regards the observed variable as the criterion, and the parental report variable as a screen for disturbance, one can then calculate the sensitivity, specificity, and positive and negative predictive values for the CBCL. This was done by running 2x2 cross-tabulations for each of the two observational tasks, with 'Observed Child Defiance' in the rows and 'Self-Reported Child Defiance' in the columns. Formulae for calculating sensitivity, specificity, and positive and negative predictive values were then applied (Akobeng, 2006).

Table 8:

The Contingent Relationship Between Reported Child Aggression and Observed Aggression/Defiance in DTT.

		Reported Child Aggression (CBCL)		Total
		.00	1.00	
DTT Child	0-1	48	10	58
Defiance	2	4	5	9
Total		52	15	67

For DTT, the prevalence of observed defiance was 13.4%. The sensitivity of the CBCL (i.e. accuracy of the CBCL in identifying those with observed defiance) was 0.56. The specificity of the CBCL (i.e. accuracy of the CBCL in identifying those without observed defiance) was 0.83. The positive predictive value of the CBCL (i.e. the probability of someone identified by the CBCL with disorder actually having the observed defiance) was 0.33; and the negative predictive value (i.e. the probably of someone identified by the CBCL as not having disorder actually not having observed defiance) was 0.92.

Thus, of those with observed defiance, the CBCL correctly identifies around a half. Of those without observed defiance, the CBCL correctly identified more than three-quarters. If carers report disorder on the CBCL, they are likely to be correct around a third of the time; and, where they report no disorder on the CBCL, they are likely to be correct nearly all of the time.

Table 9:

The Contingent Relationship Between Reported Child Aggression and Observed Aggression/Defiance in CUT.

		Reported Child Aggression (CBCL)		Total
		.00	1.00	
CUT Child	0-1	46	15	61
Defiance	2	7	1	8
Total		53	16	69

For CUT, the prevalence of observed defiance was 11.6%. The sensitivity of the CBCL was 0.13; and the specificity of the CBCL was 0.75. The positive predictive value of the CBCL was 0.063; and the negative predictive value was 0.87.

Of those with observed defiance, the CBCL identifies around an eighth correctly. Of those without observed defiance, the CBCL is correct in identifying three-quarters. If parents

report disorder on the CBCL, they are likely to be very rarely correct; but where they report no disorder, they are likely to be correct for more than three-quarters of the time.

In conclusion, for both tasks the correlation between the parents' CBCL scores and the observed ratings of observed defiance were low and not statistically significant. When the performance of the CBCL was examined in identifying those with and without observed defiance, the CBCL was poor at identifying those with observed defiance, although it performed quite well in detecting those who did not have observed defiance. Further, those identified by the CBCL as having observed defiance were unlikely to have such disturbance (0.06-0.33); but where they were identified as not having observed defiance, they were very likely to indeed not have it. (The relevance of sample size and prevalence rates to these statistics is discussed in the Discussion section).

Third Secondary Aim: Exploratory Analyses on Direction of effects

It was noted from observing the videos that, in some cases, child defiance appeared to *elicit* discipline from caregivers. As such, the causal relationship between parenting and child behaviour could have been operating in either direction. It was therefore decided that it would be useful to examine, in exploratory analyses, whether parenting in the first task, DTT, predicted Child Defiance in the second task, CUT (conducted approximately five minutes later), whilst controlling for Child Defiance in DTT. To examine this question, an ordinal regression was run in which the observed parenting variables from DTT and the Observed Child Defiance from DTT were input as predictors, thereby ensuring that the effects of the parenting variables were estimated taking into account Observed Child Defiance from DTT. The test of parallel lines was non-significant ($p=.329$), meaning that this assumption was upheld.

Table 10:
Predictive relationship between observed parenting in DTT and observed child defiance in CUT.

		Estimate	S.E.	Wald	df	Sig.	95%CI	
							Lower Bound	Upper Bound
Threshold	[Child Defiance (“Clean up”)=.00]	.15	.54	.08	1	.778	-.90	1.20
	[Child Defiance (“Clean up”)=1.00]	4.01	.79	25.47	1	.000	2.45	5.57
Location	Observed Harsh Physical	-.23	.71	.11	1	.740	-1.62	1.15
	Observed Physical Guidance	-1.01	.76	1.75	1	.185	-2.51	.49
	Observed Verbal Guidance	.32	.32	1.03	1	.310	-.30	.94
	Observed Harsh Verbal	-.56	.77	.53	1	.466	-2.08	.95
	Observed Child Defiance	1.44	.70	4.27	1	.039	.07	2.81
	Gender	1.10	.59	3.50	1	.062	-.05	2.25

Link function: Logit.

The overall model was statistically significant ($X^2(6) = 15.21, p = .019$). McFadden’s Pseudo R-Square was 0.13, indicating that the model predicted 13% of the variance in CUT Observed Child Defiance. However, the only individual variable that was statistically significant was Observed Child Defiance from DTT. Thus, none of the observed parenting variables from DTT significantly predicted Observed Child Defiance in CUT, controlling for Child Defiance in DTT.

A second analysis was conducted to investigate the issue of direction of effects further, namely an examination of whether observed parenting in CUT was related to the child’s aggression/defiance in DTT. Because this latter analysis concerns the prediction from a *later* to an *earlier* time period, it approximates more to an estimation of whether general parenting style is related to general child behaviour in challenging situations than the previous prospective analysis. A similar model to the one outlined above was run, this time controlling for child defiance within CUT (because this may have elicited carer discipline). The test of parallel lines was statistically significant ($p = .030$), meaning that this assumption was violated. Accordingly, the partial proportional odds method (Williams, 2006) was used for this model. The overall model was statistically significant ($X^2(8) = 28.62, p < .001$), and the Pseudo R² was 0.227, indicating that the variables in the model explained approximately 22.7% of the variance in child defiance. The only variable that was individually significant

was Observed Harsh Verbal Discipline ($b = 1.79$, $SE = 0.89$, $95\%CI = 0.04 - 3.54$, $p = .045$), indicating that when levels of harsh verbal discipline were higher in CUT, child defiance was also higher in DTT (see Table 14).

Table 11:
'Predictive' relationship between observed parenting in CUT and observed child defiance in DTT.

	Estimate	S.E.	z	Sig.	95%CI	
					Lower Bound	Upper Bound
Intercept	-0.42	1.10	-0.38	.707	-2.58	1.75
0 Observed Harsh Physical Discipline	0.30	0.79	0.38	.701	-1.25	1.86
Observed Verbal Guidance	0.81	0.47	1.71	.088	-0.12	1.74
Intercept	0.42	1.46	0.29	.774	-2.44	3.27
1 Observed Harsh Physical Discipline	-2.20	1.17	-1.89	.059	-4.49	1.90
Observed Verbal Guidance	-1.23	0.74	-1.67	.095	-2.67	-0.21
Observed Harsh Verbal Discipline	1.79	0.89	2.00	.045	0.04	3.54
Observed Physical Guidance	-0.59	0.47	-1.28	.201	-1.51	0.32
Observed Child Defiance (Clean up)	0.75	0.59	1.27	.206	-0.41	1.90
Gender	-0.54	0.57	-0.94	.349	-1.66	0.59

Discussion

Little is known about the relationship between parenting and child aggression in LMICs. This study was designed to address this gap. Like the limited LMIC research in this area to date, this study used carer-reports of parenting and child behaviour, but it was novel in also employing direct observations. Notably, these observations were made in controlled but ecologically valid challenging conditions.

Analyses examining the relationship between carer discipline strategies and child aggression/defiance confirmed a number of associations in line with the two hypotheses of this study. Thus, in both observational tasks, higher levels of Observed Harsh Physical Discipline were associated with more severe child defiance, and higher levels of guidance with lower levels of defiance. Interestingly, in each task, the form of guidance that was significant was appropriate to the particular task demands. Thus, verbal guidance was important in DTT (e.g. explaining the prohibition), whereas physical guidance was important in CUT (e.g. helping to pick up toys). Finally, self-reported Psychologically Aggressive Discipline was associated with carer-reported child aggression/defiance. No other

associations obtained between parenting and child outcome, except for one unexpected finding, namely, that higher levels of Observed Harsh Physical Discipline in CUT were associated with a lower likelihood of the child having clinically significant reported aggression/defiance. One possible interpretation of this apparently anomalous finding is that harsh carers may not recognise aggression in others as problematic.

These findings support the conclusions of extensive research using both self-reports and observations in HICs. For example, Scott et al. (2012), using self-report assessments, found associations between harsh parenting and child antisocial behaviour. Similarly, Crockenberg and Litman (1990), using observational methods, found negative psychological and physical discipline strategies to be associated with higher levels of child defiance. Notably, the results of the current study confirm and extend LMIC findings based mainly on parent report data. For example, Ward et al. (2015) found self-reported harsh physical parenting (i.e., corporal punishment) to be associated with reported child externalising symptoms (i.e., aggression and defiance), and positive parenting strategies with lower levels of child behaviour problems. The confirmation of these findings is especially important because it has been suggested that in countries where harsh parenting is normative, such as South Africa (Ward et al., 2015), the same relationship between harsh parenting and child aggression/defiance is less likely to hold (Lansford et al., 2005).

In the current study, child gender was significantly associated with both harsh parenting and child aggression. Defiance was higher in boys, consistent with extensive research (e.g. Tremblay et al., 2004) (but in contradiction of Murray et al. (2013) who did not find this association in a review of Brazilian studies). Further, observed harsh physical parenting was also higher for boys. This is consistent with Straus and Stewart's (1999) finding from a large nationally representative U.S. sample, although in a meta-analysis by Gershoff (2002) this relationship did not consistently emerge. Finally, there was no evidence that the relationship between harsh physical discipline and child defiance differed by child gender. This is a notable finding, because it suggests that harsh parenting is just as relevant where the child is female as it is where the child is male.

An examination of the relationship between reported parenting variables and their observed counterparts revealed, importantly, that different patterns of findings obtained for reported positive versus negative parenting. Thus, reported Non-Violent Discipline was positively correlated with Observed Verbal Guidance in both observational tasks, and it was negatively correlated with Observed Harsh Verbal Discipline in DTT. Thus, carers who reported using non-violent discipline strategies (explaining and taking away privileges) were

also observed using higher rates of verbal guidance and lower rates of harsh verbal discipline. By contrast, what participants *reported* about their negative physically violent discipline and psychologically aggressive discipline strategies did *not* correspond to what was observed. This indicates that, probably because of social desirability effects, parents report less use of harsh discipline strategies than they in fact use in practice; nevertheless, they may be quite accurate about their use of more positive practices. This finding raises serious doubts about the validity of self-report assessments of harsh parenting, at in LMIC settings.

The investigation of the relationship between carer reports of child behaviour problems (CBCL) and observed child behaviour revealed the CBCL to perform poorly as a case identifier. Thus, although the CBCL performed quite well in identifying those *without* observed defiance, it was extremely poor at identifying those *with* such defiance. Further, although those identified by the CBCL as *not* defiant were very likely indeed not to show it, those identified by the CBCL *as* aggressive/defiant were unlikely to show such disturbance. The implications of this are that the CBCL, a widely used measure of child aggression/defiance, may not be a valid estimator of child defiance in a young South African sample. This stands in contrast with evidence from HICs (Achenbach & Rescorla, 2000). Nevertheless, caution is required in drawing any firm conclusions from the present study on this point, given that predictive value is so dependent on sample size (Rudser, Bendert, & Koopmeiners, 2014), and the number of those with child observed problems was not large. Further research is required on a large sample to resolve this issue.

In exploratory analyses, the direction of effects in the relationship between parenting and child behaviour was investigated. Kochanska and Aksan (1995) noted that in some observational assessments, children *elicited* harsh parenting. However, other research has found that, despite this, changes in parental discipline are followed by changes in child antisocial behaviour (e.g. Bor & Sanders, 2004). In the current study, this issue was explored, first by examining whether parenting in the first task was associated with child defiance in the second task, conducted five minutes later, whilst controlling for the effect of child defiance in the first task. Child defiance in the first task was found to be the only significant predictor, with parenting in the first task not predicting child defiance in the second, over and above the influence of child defiance in the first task. In a further exploratory analysis, the association between parenting in the second task and child defiance in the first task was examined. This could be considered a closer approximation to an estimation of general parenting effects on child behaviour than the former analysis, because it avoids the impact of continuity in child defiance, as well as taking account of the extent to which child defiance

elicited harsh parenting. It was found that Observed Harsh Verbal Discipline in the second task predicted Child Defiance in the first task. This suggests that general patterns of harsh verbal discipline may be associated with general patterns of child defiance. This supports the hypothesis that harsh parenting is associated with child behavioural problems as a direct effect, rather than as a response to the child's behaviour. This conclusion must be regarded as merely suggestive of a causal association, given the fact that the significant association is not derived from true longitudinal relationship between the critical variables.

Strengths and Limitations

A major strength of the current study is that it utilised both observational measures of parenting and child behaviour. As discussed, carer/self-reported measures may be vulnerable to social desirability effects, as indicated by the weak association between carer-reported harsh parenting and observed harsh parenting. Indeed, this was consistent with the poor sensitivity and positive predictive value of the CBCL in identifying children observed as defiant. Notably, Gardner (2000) found that observational measures of parenting were better predictors of child outcome than reported measures. We can also have confidence in the findings derived from analyses involving the observational measures of parenting because of the evidence for convergent validity (i.e. the association between the relevant parenting variables within and between tasks).

The study had certain limitations. The cross-sectional nature of the design means that, despite exploratory investigation into the direction of effects, as noted above firm causal inferences cannot be made. Second, the sample size was somewhat small ($N = 69$), and for certain analyses the study may have been under-powered. For example, for both correlations and regression analyses, several statistics had a significance level between .05 and .10, and, with a larger sample, these associations may have emerged as significant. Finally, a weakness of the current study is that the CBCL cut-off for child aggression/defiance was based on international, not local norms. This was necessary, given the state of the field, but it would be an advance if local norms for the CBCL were established.

Conclusion and Directions for Future Research

This study adds to the body of research from HICs demonstrating the association between harsh parenting and child aggression, as well as to the limited LMIC literature. A significant association was found between parenting strategies, especially observed harsh parenting, and child aggression/defiance. Notably, this association obtained for both boys and

girls. This study provides a basis for two further lines of important research. First, longitudinal research designs could clarify the causal role of parenting and child factors in the development of child aggression. Second, this study also provides impetus for research into interventions to reduce negative parenting and promote positive parenting. The demonstration of the efficacy of parenting interventions that modified harsh parenting and correspondingly reduced levels of child aggression could be of major significance to international efforts to reduce levels of violence in poor communities.

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Appendix A



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08-Feb-2016 Tomlinson, Mark MR

Approved with Stipulations Response to Modifications- (New Application)

Ethics Reference #: N15/09/084 Title: The Evaluation of a Parenting Intervention to Prevent the Development of Aggression in Children in South Africa.

Dear Prof Mark Tomlinson, The **Response to Modifications - (New Application)** received on **08-Feb-2016**, was reviewed by members of **Health Research Ethics Committee 1**

via Expedited review procedures on **08-Feb-2016**. Please note the following information about your approved research protocol:

Protocol Approval Period: **08-Feb-2016 -07-Feb-2017**

The Stipulations of your ethics approval are as follows:

Kindly remove the field "Caregiver name" from the questionnaire. Towards protection of confidentiality committed to in your protocol, please make sure that there are no fields in any of your questionnaires or data capture sheets that require the name of either the caregiver or the child. There should only be fields for capturing the unique identifier codes. A separate, password-protected document should be kept by the PI which links the unique identifiers with the names.

Kindly submit your finalised corrected questionnaires and any related data capture sheets to the HREC prior to the commencement of data collection.

Please remember to use your **protocol number (N15/09/084)** on any documents or correspondence with the HREC concerning your research protocol. Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or

monitor the conduct of your research and the consent process.

After Ethical Review:

Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit. Translation of the consent document to the

language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372 Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Helene Visser at City Health (Helene.Visser@capetown.gov.za Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research. For standard HREC forms and documents please visit: www.sun.ac.za/rds

If you have any questions or need further assistance, please contact the HREC office at 0219389657.

Included Documents:

20160208 MOD2 Appendix B Questionnaire CV P Cooper Checklist Declaration L Murray

Protocol Synopsis 20160128 MOD HREC letter Application form Participant information leaflet & consent form 20160208 MOD2 Cover letter Declaration M Tomlinson 20160128 MOD Protocol CV L Murray Budget Protocol CV M Tomlinson 20160128 MOD Cover letter Declaration P Cooper Payment instruction form 20160128 MOD Appendix B - Questionnaires 20160128 MOD Appendix A - Measures Study agreement

Sincerely,

Franklin Weber HREC Coordinator Health Research Ethics Committee 1

Investigator Responsibilities Protection of Human Research Participants

Some of the responsibilities investigators have when conducting research involving human

participants are listed below:

1. Conducting the Research. You are responsible for making sure that the research is conducted according to the HREC approved research protocol. You are also responsible for the actions of all your co-investigators and research staff involved with this research.

2. Participant Enrolment. You may not recruit or enrol participants prior to the HREC approval date or after the expiration date of HREC approval. All recruitment materials for any form of media must be approved by the HREC prior to their use. If you need to recruit more participants than was noted in your HREC approval letter, you must submit an amendment requesting an increase in the number of participants.

3. Informed Consent. You are responsible for obtaining and documenting effective informed consent using **only** the HREC-approved consent documents, and for ensuring that no human participants are involved in research prior to obtaining their informed consent. Please give all participants copies of the signed informed consent documents. Keep the originals in your secured research files for at least fifteen (15) years.

4. Continuing Review. The HREC must review and approve all HREC-approved research protocols at intervals appropriate to the degree of risk but not less than once per year. There is **no grace period**. Prior to the date on which the HREC approval of the research expires, **it is your responsibility to submit the continuing review report in a timely fashion to ensure a lapse in HREC approval does not occur**. If HREC approval of your research lapses, you must stop new participant enrolment, and contact the HREC office immediately.

5. Amendments and Changes. If you wish to amend or change any aspect of your research (such as research design, interventions or procedures, number of participants, participant population, informed consent document, instruments, surveys or recruiting material), you must submit the amendment to the HREC for review using the current Amendment Form. You **may not initiate** any amendments or changes to your research without first obtaining written HREC review and approval. The **only exception** is when it is necessary to eliminate apparent immediate hazards to participants and the HREC should be immediately informed of this necessity.

6. Adverse or Unanticipated Events. Any serious adverse events, participant complaints, and all unanticipated problems that involve risks to participants or others, as well as any research-related injuries, occurring at this institution or at other performance sites must be reported to the HREC within **five (5) days** of discovery of the incident. You must also report any instances of serious or continuing problems, or non-compliance with the HRECs requirements for protecting human research participants. The only exception to this policy is that the death of a research participant must be reported in accordance with the Stellenbosch University Health Research Ethics Committee Standard Operating Procedures www.sun025.sun.ac.za/portal/page/portal/Health_Sciences/English/Centres%20and%20Institutions/Research_Development_Support/Ethics/Application_package All reportable events should be submitted to the HREC using the Serious Adverse Event Report Form.

7. Research Record Keeping. You must keep the following research-related records, at a minimum, in a secure location for a minimum of fifteen years: the HREC approved research protocol and all amendments; all informed consent documents; recruiting materials; continuing review reports; adverse or unanticipated events; and all correspondence from the

HREC

8.Reports to the MCC and Sponsor. When you submit the required annual report to the MCC or you submit required reports to your sponsor, you must provide a copy of that report to the HREC. You may submit the report at the time of continuing HREC review.

9.Provision of Emergency Medical Care. When a physician provides emergency medical care to a participant without prior HREC review and approval, to the extent permitted by law, such activities will not be recognised as research nor will the data obtained by any such activities should it be used in support of research.

10.Final reports. When you have completed (no further participant enrolment, interactions, interventions or data analysis) or stopped work on your research, you must submit a Final Report to the HREC.

11.On-Site Evaluations, MCC Inspections, or Audits. If you are notified that your research will be reviewed or audited by the MCC, the sponsor, any other external agency or any internal group, you must inform the HREC immediately of the impending audit/evaluation.

Appendix B

Participant Information and Consent form

Title of Research Project:	The Evaluation of a Parenting Intervention to Prevent the Development of Aggression in Children in South Africa
Reference Number:	To be added
Principal Investigator:	Prof Mark Tomlinson
Address:	Department of Psychology, Stellenbosch University, Wilcocks Building, Ryneveld Rd
Contact Number:	(021) 808 3446 or 083 301 4868

Participant Information Sheet

You are being invited to take part in a research project. Please take some time to read the information on this form, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you clearly understand what this research is about and how you could be involved. Also, whether you choose to be involved in this study or not is completely up to you. No one is forcing you to take part. If you say no, this will not affect you in any way whatsoever. You are also free to change your mind at any point, even if you do agree to take part in the beginning. If you choose to not answer a question, or end your participation in the whole study, you do not need to give any explanation. Deciding not to be involved, or not answer some questions, or even choosing to stop at a later point, will have no effect on your involvement in any other study. Any information that identifies you personally will be kept confidential, and all the information you give will be done in private.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and

principles of the international Declaration of Helsinki (October 2013), South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research. The following information about the study will be read and explained to you carefully, and you will have a chance to ask questions and discuss it with others. If there is anything that is not clear or if you would like more information, please ask us.

Thank you!

What is this research study all about?

This study will be run from a Research Centre in Khayelitsha. We are inviting 140 carers of 23-27 months babies to come to our centre with their baby. We want to see if a parenting and education programme that we have developed, which helps babies to learn more language, can also help them learn about emotions and friendships. We will be able to see if the programme works by comparing a group who receive the programme with a group who have not yet received the programme.

How will we do this study?

All 140 carers and their children will be assessed three times: at the beginning of the study, 2 months later, and then 4 months later. Each of these three assessments will last for between 2-3 hours and will happen at the research centre in Khayelitsha. We will ask you a number of questions about yourself and your baby, and then we will do some assessments with your baby. We will also ask you to do some activities (e.g. play) with your baby during the assessments. We will audio and video record some of these activities for our study records.

The parenting and education programme will involve carers coming in to the centre once a week for eight weeks. Carers will meet in groups of four or five. During the sessions, which will last for about 90 minutes, a facilitator will present information, show the group videos, and lead a discussion about how carers can help their child develop well.

Why would we like you to participate?

We would like you to participate because you are caring for a child who is between the ages of 23-27 months.

Will you benefit from taking part in this research?

In this study, we are trying to find out if our programme helps carers to help their children to develop well. The findings will help to improve children's education programmes across our country. From our previous experience with this programme we are confident that you will find it interesting and helpful. The programme is likely to help your child develop well and be better prepared for starting school. You may also find that the programme helps you and your child relate well together.

Can there be any problems for you or your child if you take part in the study?

In this study we will be helping you help your child to develop well. From our previous experience we think that you will find the programme enjoyable and helpful. We do not believe that either you or your child will experience any problems as a consequence of your receiving the programme. Also, the assessments we will be making before and after the programme are ones that we have used before with carers and children in Khayelitsha and neither the carers nor the children have experienced any difficulty. But, if in the assessment you or your child feels tired, you can ask for a little break. You can also stop taking part in the study at any time, if you want to. If at any point you feel upset or worried about anything, we can put you in contact with local health or NGO organizations that can help. Also, if anything worries you, we will give you Professor Mark Tomlinson's phone number at Stellenbosch University, and you can phone him if you want to do so.

If you don't want to be in the study, or you have questions or complaints, what can you do?

You only have to be in this study if you choose to be in it. There is no penalty and no problem if you don't want to be in the study or if you want to stop being in it. The staff will answer any questions that you have, and if you are not satisfied, or you have complaints, you can speak to Professor Mark Tomlinson. If you are still not satisfied, you can call the Committee for Human Research at Stellenbosch University, at 021 938 9207.

Who will be able to see this information from the study?

Only the research staff working on this study can see the information we collect. Anything you tell us is private and confidential and it cannot be connected to you. In the interviews we will ask you to give the names of the people in your household, but we will not allow anyone else to see any of this information. It is only for the people working on the research. The information can only be used for research and it will be kept on computers in a safe place and only the research staff can see it. We will write about the results of the study, but your names and your personal information will not be used and will be kept safe and will not be given to anybody else.

Will you be paid to take part in this study and will there be any costs to you?

You will be compensated for the time that you come into the centre for assessments. For each assessment you will be given a R120 Shoprite voucher. There will also be no costs to you to take part in the study.

Consent

First, you will have the chance to ask anything you want about the study, in private. When you understand everything you need to about it, you will be asked to sign a consent form, if you agree to take part in the study.

Is there anything else that you should know or do?

- You can contact Prof. Mark Tomlinson at 021-8083461 if you have any further queries or encounter any problems.
- You can contact the Health Research Ethics Committee at 021-938 9207 if you have any other concerns or complaints
- You will receive a copy of this information and consent form for your own records.

PARTICIPANT CONSENT FORM

You will be given a copy of this information sheet and consent form to keep. Participation in this study is voluntary. This means you can refuse to be a part of this study. Also, you can decide to withdraw from this study at any point without anything bad happening or you losing any benefits you might have. If you wish to stop at any time, just tell anyone on the research team.

1. Have you read or been read this information and understood the information given here?

___ Yes ___ No

2. Have you had an opportunity to ask any questions of the research team, received answers, and been able to ask for additional information?

___ Yes ___ No

3. Do you understand that you can withdraw from the study without penalty at any time by telling any member of the research team?

___ Yes ___ No

4. Do you understand who will be able to see to your information, how this information is stored, and what happens to the information at the end of the study?

___ Yes ___ No

5. Do you understand that some of the activities with you and/or you child will be video or audio recorded, and that these will be used for research purposes?

___ Yes ___ No

5.b. If you would not like us to use the video for training, education, conference and promotional purposes, you may opt out here:

You may use the video _____ You may NOT use the video _____

Please sign your name if you understand what is involved and agree to participate:

Printed name of participant..... Printed

name of participant's child.....

Signature of participant.....

Date..... Place.....

Printed name of researcher..... Signature of

researcher gaining consent.....

Date.....

Place.....

Appendix C

Section 6. Child Behaviour Check List - Aggression Scale

6.1 Child Behaviour Checklist

Below is a list of items that describe children. For each item that describes your child now or within the past 2 month, please state if the item is 'very true or often true', 'somewhat true or sometimes true' or 'not true'. Please answer all the items as well as you can, even if some do not seem to apply to the child.

6.2 Item 8

Can't stand waiting, wants everything now

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]

6.3 Item 15

Defiant

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]

6.4 Item 16

Demands must be met immediately

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]

6.5 Item 18

Destroys things belonging to his/ her family or other children

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]

6.6 Item 20

Disobedient

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]

6.7 Item 27**Doesn't seem to feel guilty after misbehaving**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.8 Item 29**Easily frustrated**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.9 Item 35**Gets in many fights**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.10 Item 40**Hits others**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.11 Item 42**Hurts animals or people without meaning to**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.12 Item 44**Angry moods**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.13 Item 53**Physically attacks people**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.14 Item 58**Punishment doesn't change his/ her behaviour**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.15 Item 66**Screams**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.16 Item 69**Selfish or won't share**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.17 Item 85**Temper tantrums or hot temper**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.18 Item 81**Stubborn, sullen, or irritable**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]
-

6.19 Item 88**Uncooperative**

Expects a single option response (required)

- Not true [0]
- Somewhat or sometimes true [1]
- Very or often true [2]

6.20 Item 96**Wants a lot of attention**

Expects a single option response (required)

- Not true [0]
 - Somewhat or sometimes true [1]
 - Very or often true [2]
-

Appendix D

Discipline and Violence Questionnaire

All adults have certain ways to teach children the right behaviour or to address problem behaviour. I will read to you various methods that are used and I want you to tell me if you or anyone else in your household has used this method with your child in the past month.

8.2 Take Away Privileges_1

Took away any privileges, forbade something your child liked or did not allow him/her to leave the house?

Expects a single option response (required)

Yes [1]

No [2]

8.3 Explain Wrong Deeds

Explain why something (the behaviour) was wrong?

Expects a single option response (required)

Yes [1]

No [2]

8.4 Shook Child

Shook him/her?

Expects a single option response (required)

Yes [1]

No [2]

8.5 Shouting

Shouted, yelled or screamed at him/her?

Expects a single option response (required)

Yes [1]

No [2]

8.6 Distract

Give him/her something else to do?

Expects a single option response (required)

Yes [1]

No [2]

8.7 Corrections of Child Misbehaviour Reminder

Reminder: I want you to tell me if you or anyone else in your household has used this method with your child in the past month.

8.8 Spanked or Slapped

Spanked, hit or slapped him/her on the bottom with the bare hand?

Expects a single option response (required)

Yes [1]

No [2]

8.9 Hitting

Hit him/her on the bottom or elsewhere on the body with something like a belt, hairbrush, stick or other hard object?

Expects a single option response (required)

Yes [1]

No [2]

8.10 Called Names

Called him/her dumb, lazy or another name like that?

Expects a single option response (required)

Yes [1]

No [2]

8.11 Hit or Slap on Body_1

Hit or slapped him/her on the face, head or ears?

Expects a single option response (required)

Yes [1]

No [2]

8.12 Hit or Slap on Body_2

Hit or slapped him/her on the hand, arm or leg?

Expects a single option response (required)

Yes [1]

No [2]

8.13 Beat with Implement

Beat him/her with an implement (hit over and over as hard as one could)?

Expects a single option response (required)

Yes [1]

No [2]

Aggregated questions (Lansford & Deater-Deckard, 2012):

Non-Violent Discipline: Qs 8.2, 8.3, & 8.6.

Physically Violent Discipline: Qs 8.4, 8.8, 8.9, 8.11, 8.12, & 8.13.

Psychologically Violent Discipline: Qs 8.5, & 8.10.

Appendix E

Details of Observational Assessments

1. The “don’t touch” –prohibition – task. The caregiver and child are asked to sit on a carpet on the floor of the assessment room. The assessor then enters and places several attractive toys near to the child. She then explains in isiXhosa to the parent and child what the toys are and shows how they work, and then tells the caregiver that they must not let the child play with the toys at the moment, and that she will return to tell the parent when the child can play with them. The interaction during the “don’t touch” period is video-recorded for 2 minutes and 20 seconds.
2. The “clean-up” task. After the “don’t touch” task, the assessor informs the parent that the child can now play with the toys, and withdraws. After 4 minutes the assessor returns and gives a 1-minute warning before the toys need to be put away, and then leaves. Following this 1-minute warning, the assessor returns and places a box near the parent and child, and asks the carer to get the child to clean up the toys by putting them in the box. The interaction is video recorded for up to 2 minutes.

Appendix F

Coding scheme for Child Defiance/Non-compliance, Carer Harsh Discipline, and Guidance, and joint Carer-Child Reciprocity

A. Child Behaviour

Defiance/Non-Compliance (This dimension was developed based on the coding scheme used by Crockenberg & Litman (1990), and Kochanska and colleagues (Kochanska, 1995; Kochanska & Aksan, 1995; Kochanska, Aksan, & Koenig, 1995) and broadly replicated in other studies (e.g., NICHD, 1998; Pereira, Negrao, Soares, & Mesman, 2014; Yagmur, Mesman, Malda, Bakermans-Kranenburg, & Ekmekci, 2014)). For both the “don’t touch” and the “clean up” tasks, children’s non-compliance are rated using six mutually exclusive behaviour categories, with the predominant behaviour category scored in 20 second time blocks. Definitions for each task necessarily vary slightly.

Don’t touch task***Defiance/compliance***

Strong Defiance- overt resistance to the carer’s agenda. Child does not accept the prohibition/constraint and resists with **strong** defiance, anger, whining, temper tantrum for most of the time. **Score 5**

Moderate Defiance- overt resistance to the carer’s agenda Child does not accept the prohibition/constraint and resists with strong defiance, anger, whining, temper tantrum for up to half of the time, or else **moderate** defiance with anger/whining/protest vocalizations for most of the time. **Score 4**

Refusal non-aversive: overt resistance to the carer’s agenda. Child does not accept the prohibition/constraint, and when the carer addresses/tries to control them, they resist, but not in a strongly distressed, angry/aversive manner, as in a 4, but may push carer’s arm/hand away, or whine ranging from briefly up to half the time. **Score 3**

Passive non-compliance: reluctance to accept carer’s agenda. Child ignores or partially ignores carer’s prohibition and makes at least two active efforts to reach the toys, or they may strain against being held/limited, or briefly whine. They do not, however, show signs of

overt, active resistance/refusal (e.g., strongly/actively pushing carer's arm away as in 3).

Score 2

Situational: Acceptance of the carer's agenda. Child is generally willing to comply with the prohibition, but makes moves/stretch towards toys, or asks if they can touch them, and needs reminding not to touch. Cooperates with carer's reminders, and responds to carer's distraction; they might appear a little reluctant to comply but do not actively resist. **Score 1**

Committed: Full acceptance of carer's agenda. Child makes no attempt to touch the toys, although they might ask the carer about them. The carer's/researcher's agenda seems to function as the child's own. **Score 0**

Clean Up Task

Defiance/compliance

Strong defiance: overt resistance to the carer's agenda. Child refuses to comply with task and reacts with strong defiance, poorly controlled anger, whining, temper for most of the time. **Score 5**

Moderate defiance: overt resistance to the carer's agenda. Child does not clean up on their own, and resists with strong defiance, anger, whining, temper tantrum for up to half of the time, or else **moderate** defiance with anger/whining/protest vocalizations for most of the time. **Score 4**

Refusal non-aversive: overt resistance to the carer's agenda. reluctance to accept carer's agenda. Child does not clean up on their own. When prompted, they tend to be reluctant and ignore and resist, but not in a strongly distressed, angry/aversive manner, as in a 4, but may push carer's arm/hand away, or whine ranging from briefly up to half the time. **Score 3**

Passive non-compliance: reluctance to accept carer's agenda. Child is generally cooperative but requires carer's prompting to stay on task, or else they cease to comply. The child may strain against being encouraged/asked to put a toy away, or briefly whine. Or they may continue playing, having not engaged with the instruction to clean up. They do not, however, show signs of overt, active resistance/refusal (e.g., strongly/actively pushing carer's arm away as in 3). **Score 2**

Situational: Acceptance of the carer's agenda Child is generally willing to comply with the prohibition, but needs reminding about the task. Cooperates with carer's reminders, and responds to carer's distraction; they might appear a little reluctant to comply but do not actively resist. **Score 1**

Committed: Full acceptance of carer's agenda Child embraces the task willingly and appears to embrace it wholeheartedly. Does not *require* carer intervention (although the carer might support the child). The carer's agenda seems to function as the child's own. **Score 0**

B. Carer Behaviour

Coding was developed based on schemes used by Crockenberg & Litman (1990) and Kochanska and colleagues (Kochanska, 1995; Kochanska, 1997; Kochanska & Aksan, 1995), and broadly replicated by Pereira and colleagues (2014).

(i) Coercive, harsh, control: For both the “don't touch” and the “clean up” tasks, carer behaviour is coded using two measures: a) a four-point scale concerning the degree of **physical** coercive control, rated for each 20 second time block, and b) an event count of **verbal threat/coercive control** for the whole period.

Physical Coercive / Harsh Discipline Scale: This behaviour involves power assertion and the use of force. It includes: physically enforcing child behaviour; forcibly taking toys away from the the child; restraining or holding the child forcibly; spanking; slapping; grabbing; holding child's face forcibly; pulling child's arm (hard), imposing an action on the child; turning child forcibly, making threatening gesture; showing anger.

Don't touch task.

0 = carer shows no use of force or physical restraint throughout the time block. Can include brief, light, physical contact to remind child- e.g., placing hand lightly on arm. Can include straightening child, placing them in a more comfortable position. Can include a physical game that inevitably involves physical contact, but which is done without any hint of restraint.

1 = carer shows either one brief episode of clear, but not strong, physical restraint (e.g., pulling child away from toys, or stopping them moving towards them, but not with clear force), or prolonged mild restraint (e.g., holding arms around child so that they cannot move

towards toys, but not holding tight; or resists child's attempts to push parent's arm/hand away), or plays a game that is clearly somewhat restraining.

2= carer shows either one brief episode of clear, strong, physical force (e.g. pulling child away forcibly), or several instances of clear, but not strong physical restraint, or else prolonged moderate force without aggression (e.g., holding arms tightly around child so that they cannot move towards toys).

3 = carer shows one episode of clear directed aggression (e.g., smack, hit, clear threat gesture, holding child's face forcibly), or more than one episode, or prolonged use, of clear strong physical restraint, not necessarily accompanied by clear directed aggression (e.g., forceful pulling, gripping with strong force).

Verbal Coercive/ Harsh Discipline Events: This behaviour involves power assertion and use of verbal, but not physical force. It includes: criticisms, threats, angry commands, screaming, harsh, irritated voice.

Don't touch task

(ii) Guidance: This dimension de-emphasises power assertion and concerns how much the carer provides support and guidance for the child to manage the task. For both tasks, carer behaviour is coded using two four-point scales, rated for each 20 second time block. These concern the degree of a) **verbal support-guidance**, and b) **physical support-guidance**. The same definitions apply to both clean up and don't touch tasks.

Verbal support- guidance: scales concern techniques such as reasoning, providing distractions (e.g., re-directing child's attention to another object or behaviour, e.g., naming or counting); positive incentives (e.g., telling child they can play later); suggestions; explanation for delay for "don't touch"; induction (explanation about norms), and mild prompts. Note, reasons and explanations are considered high quality support. If distraction and reasons are given in the context of a threat, do **not** count as guidance, but count as a verbal threat- e.g., 'Do you see that lady standing in the corner/that lady there/she will beat you'. If a verbal threat is used, and is then followed by a positive verbal guidance, or *vice versa*, within the same time block, code both. If the utterance is **ambiguous**- e.g., 'Don't cry, *we will leave*', do not give credit, but also do not score as a verbal threat.

Don't touch task

0 = carer shows no use of verbal support-guidance

1 = carer uses one or at most two mild prompts- never harsh, or briefly uses a verbal distraction, or mention of a later positive activity, or briefly engages in a verbal activity, or makes a single, isolated, brief mention of getting the toy later 'e.g., 'you will take it'

Examples: ID 7 'Wait, don't rush, do it, look, look'

ID 7 'Come let's do it'

ID 9 'Wait don't touch, please don't touch'

ID 9 'Come, don't touch the toys'

ID 37 'You will play'

2 = carer distracts child or engages them in a verbal activity more than just briefly, but not all the time- they might draw the child's attention to something in the room, or engage them in a song or counting; they may briefly mention the task element, they may use mild prompts, they may make more than one brief mention of getting the toy later. Verbal support may be accompanied by a physical action, like a point, or like moving child during a song, but if the verbal element predominates code only the verbal code. Note, if the physical element is just as predominant- e.g., having a conversation about the child's shoe while moving it around and physically exploring it, a physical support code can also be given.

Examples: ID 11 'Look at the foot, show the foot, and another one'

ID 11 'His mother/ wait, wait/ don't take/ Yo, Yo, let's count, first, say 1'

ID 11 'Wait, you will take it now/ you will take it now/ where it is.'

ID 21 'Will you play with them/do you know how to play with them?'

ID 24 'Look there, she is shooting photos/she is shooting a child'

3 = carer reasons and explains the task to the child, or provides constant engaging distraction throughout. If any negative component is included, downgrade to a 2.

Examples: ID 11 'Wait, mum will take it now, OK. Look first what the mother is doing, she is taking photos, look there. Is the mother beautiful? She's beautiful, ne?'

ID 11 'The mum will bring others first/They are coming now, now/say now/look at the mother, she's taking photos'.

ID 15 : (child: give me mum) 'These ones and this one/leave them like that, this mother is tempting us/she's tempting us/leave her with her toys.'

ID 15 'Leave her with her toys, let's ignore her./Let's ignore her with her toys/this one is for that mother, and this one./which one you want to hit this.'

ID 21 'Do not touch them (affectionate reminder)/Do you want to play? Wait/mom will give you.'

Physical support-guidance: includes playing physical games or engaging in other non-forceful activity, mainly to occupy and distract the child and support them through the task. If carer uses verbal support/guidance, and it has a clear physical focus, then it can also be coded in the physical support ratings.

Don't touch task

0 = no attempt to engage child physically, or only a very brief physical movement

1 = brief attempt at a physical game, or low level repetitive motion for more than half time- e.g., gently jiggling/rocking child on lap, or affectionate physical contact that supports the task, or that attempts to comfort the child, or brief physical- but not verbal- pointing to the room. Note a brief affectionate contact, like giving a kiss, if it seems to be done as a distraction is rated here. If carer engages with child physically through more than half the task, but without any indication that the activity is geared to distracting the child, count as 1 rather than 2 (e.g., ID 30, who rubs child's trouser to remove a mark)

2 = carer distracts or engages child in a physical game or activity more than just briefly- e.g., engaging them in clapping/dancing but not for more than half the time, or repeated use of gesture- but not words- to engage/distract the child, or gives active engaged comfort if the child is distressed.

3 = carer distracts or engages child in a physical game or activity- e.g., clapping/dancing, for most/all of the time, pointing to things to entertain most of time/throughout.

Clean Up Task

This is variable in timing, with some carer-infant pairs completing it very quickly, and others taking some minutes. Note the start and stop time and code every 20 seconds, or part of 20 seconds if over 10, for the whole period.

Physical Harsh Discipline

0 = carer shows no use of force or physical restraint throughout the time block. Can include, brief, light, physical contact to remind child- e.g., placing hand lightly on arm, or gentle steering in placing toy in box (also coded under physical guidance).

1= carer shows either one brief episode of clear, but not strong, physical control (e.g., taking toy/s away from child, but not with clear force, or cutting across child's activity with a toy and imposing the carer's own agenda to put it away without any recognition of child's experience, or being forceful in directing child's attention by, for example, repeatedly banging hard on the box).

2= carer shows either one brief episode of clear, strong, physical force (e.g. pulling toy/s away forcibly, pulling child's arm strongly to move them to the box), or several instances of clear, but not strong, forceful physical control (e.g., clear steering, but not forceful grabbing, of child's hand to put toy/s in box, or taking toy away mid play in insensitive way), or else prolonged moderate force without aggression.

3 = carer shows one episode of clear directed aggression (e.g., smack, hit, clear threat gesture, holding child's face forcibly), or more than one episode, or prolonged use, of clear strong physical force, not necessarily accompanied by clear directed aggression (e.g., forceful pulling, gripping with strong force).

Verbal Coercive/ Harsh Discipline Events. This behaviour involves power assertion and use of verbal, but not physical force. It includes: criticisms, threats, angry commands, screaming, harsh, irritated voice.

Clean up task

(ii) Guidance: This dimension de-emphasises power assertion and concerns how much the carer provides support and guidance for the child to manage the task. For both tasks, carer behaviour is coded using two four-point scales, rated for each 20 second time block. These concern the degree of a) **verbal support-guidance**, and b) **physical support-guidance**.

Verbal support- guidance scales concerns techniques such as reasoning, providing distractions or supportive accompaniments (e.g., naming colours, or counting); positive incentives (e.g., telling child they can play later); suggestions about how to do the task; explanation for the "clean up"; induction (explanation about norms), prompts/suggestions to guide child's actions, e.g., 'Let's clean up and put them in there', and endorsements/praise for

child behaviour, e.g., ‘That’s it’, ‘Well done’, and comments to indicate cooperative nature of task to support child, e.g., ‘That’s it, mother must put in this one’. Can include steering child away from ‘bad behaviour’ if done in a sensitive way, e.g., ‘Do not throw them please, put them nicely’ If distraction and reasons are given in the context of a threat, do **not** count as guidance, but count as a verbal threat- e.g., ‘Do you see that lady standing in the corner/she will beat you if you don’t clean up’. If a verbal threat is used, and is then followed by distinctly separate utterance that is positive verbal guidance, or *vice versa*, within the same time block, code both. If the utterance is **ambiguous**- eg ‘Don’t cry, *we will leave*’, do not give credit, but also do not score as a verbal threat. Prompts that are neither positive nor negative e.g. ‘put it in’ are deemed “neutral”, and can constitute some degree of verbal guidance if they are frequent within the time block.

0 = carer shows no use of verbal support-guidance, or uses just one verbal prompt that is mild/neutral, e.g. ‘put it’. If transcribed ‘prompts’ like ‘put it in there’, are said in an angry or forceful tone, do not count as a mild/neutral prompt. Also take into account if instructions are worded politely.

1 = carer uses some (i.e. 2-3) mild/neutral prompts/instruction, or one positive instruction, e.g. “*let’s* put it in here”. Positive prompts or suggestions may include some verbal activity like counting or naming colours, or singing a song; they may make an encouraging sound or comment, or briefly praise the child’s activity. Take tone of voice into account. They may express clear positive praise for the child’s efforts. They may talk about the social norms of cleaning up, and explain how to do it well, e.g., ‘Do not throw them in, put them in nicely’ if said without harsh voice quality. They may also mention leaving later, which should be interpreted as positive if used like an incentive. In the case of positive verbalisations, if a negative component is included in the same time block, downgrading the score should be considered based on the prominence of the negative versus the positive components.

2 = carer provides lots of mild/neutral prompts/instructions (3+), or two positive prompts/instructions.

3 = carer gives lots of neutral/mild prompts/suggestions and at least one positive prompt/suggestion, or alternatively they give three or more positive prompts/instructions.

Physical support-guidance includes making a physical game of the task, or helping the child to achieve it by physical support. If carer uses verbal support/guidance, and it has a clear physical focus, then it can also be coded in the physical support ratings.

0 = no attempt to support child physically, or only a very brief physical movement. The carer might do something towards achieving the task, like demonstrating where the toys should go, but if this is done sternly, with lack of any warmth, code as zero rather than giving credit as in higher ratings for the same action performed more sensitively.

1 = brief attempt at giving physical support like moving the box nearer, or moving a toy nearer, passing the child something for them to then put into the box, or supporting the toy briefly if it seems heavy for the child, or demonstrating the action to be performed. Physical guidance might involve the carer briefly and taking a toy from the child, or steering the child's hand to the box, **but this is only rated here, rather than *harsh physical* if this is done sensitively and supportively**. Note, a brief affectionate contact, like giving a kiss, if it seems to be done as a praise for the child's actions, is rated here. If carer engages with child physically, but without any indication that the activity is geared to helping the child with the clean up, do not count.

2 = carer makes more than a brief attempt to give physical support, as described above, but not for more than half the time. This may include giving claps for the child's efforts. Alternatively, the duration of support may be longer, but the quality poorer- e.g., carer simply demonstrates but does not support the child to complete the task themselves by e.g., passing things, moving box/toys nearer.

3 = carer attempt at giving physical support like moving the box nearer, or moving a toy nearer, passing or supporting the toy with the child for more than half the time, and even including gentle removal if done sensitivity.. They may show more frequent signs of physical approval than for a score of 2, like clear clapping, as appropriate, through the task.

Appendix G
Inter-rater reliability

The results of an intraclass correlation coefficient analysis (McGraw & Wong, 1996), based on independent coding of 20% of the sample by the author and a second trained coder, are provided in Table 1.

Table 1
Intraclass Correlation Coefficient

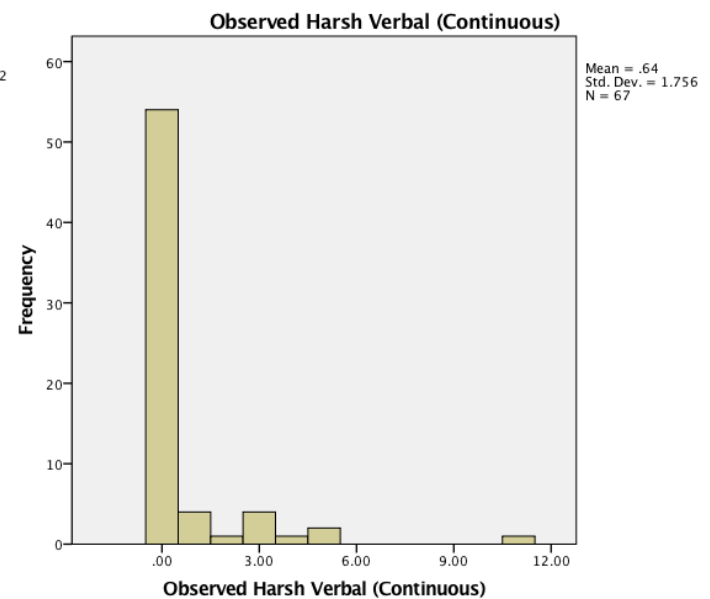
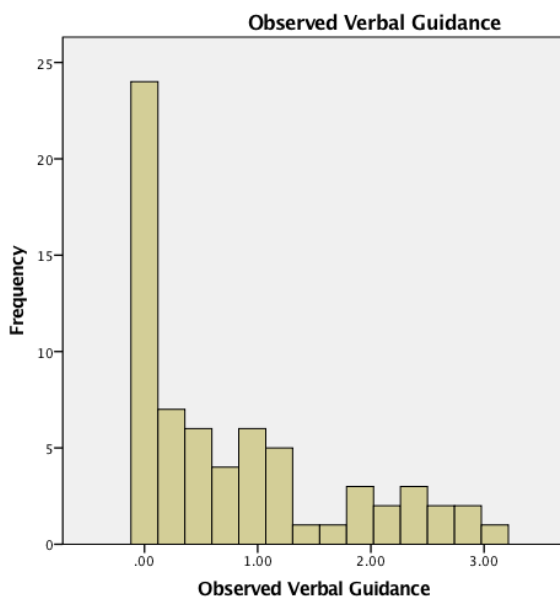
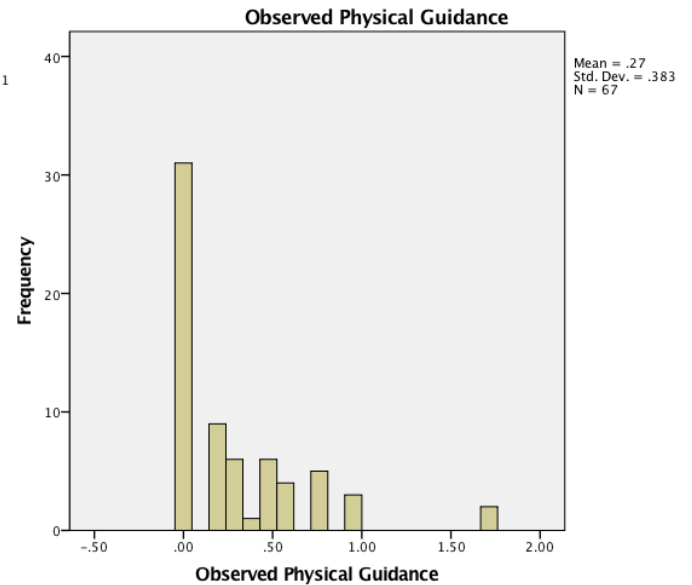
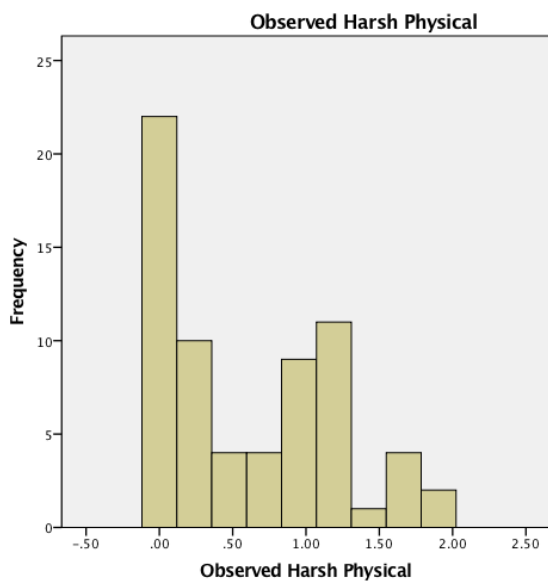
	Intraclass Correlation ^a
Harsh Physical (Don't touch) Average Measures	.98
Harsh Verbal (Don't touch) Average Measures	.92
Physical Guidance (Don't touch) Average Measures	.90
Verbal Guidance (Don't touch) Average Measures	.98
Child Defiance (Don't touch) Average Measures	.99
Harsh Physical (Clean up) Average Measures	.96
Harsh Verbal (Clean up) Average Measures	.91
Physical Guidance (Clean up) Average Measures	.91
Verbal Guidance (Clean up) Average Measures	.90
Child Defiance (Clean up) Average Measures	.95

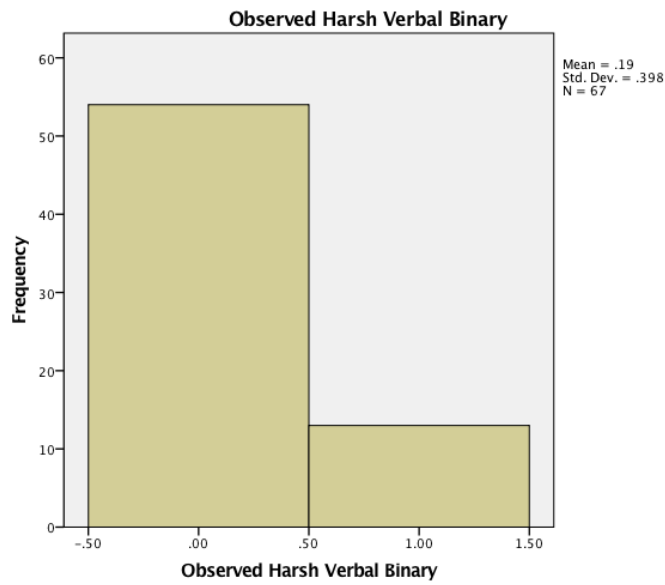
^a Type A intraclass correlation coefficients using an absolute agreement definition

Appendix H

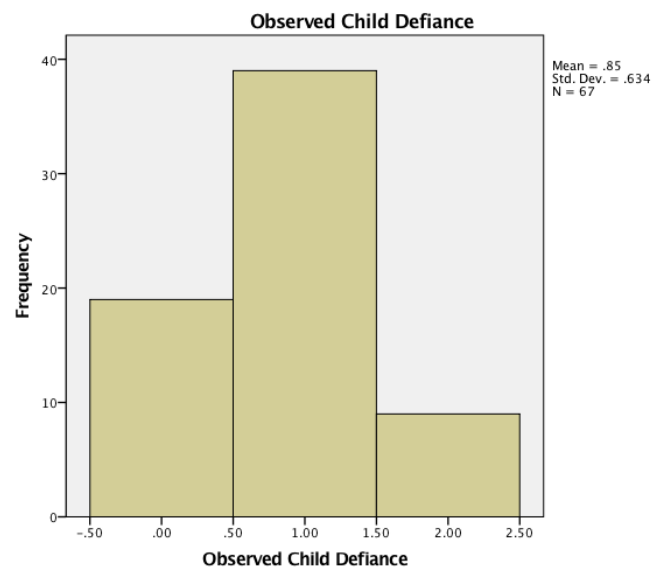
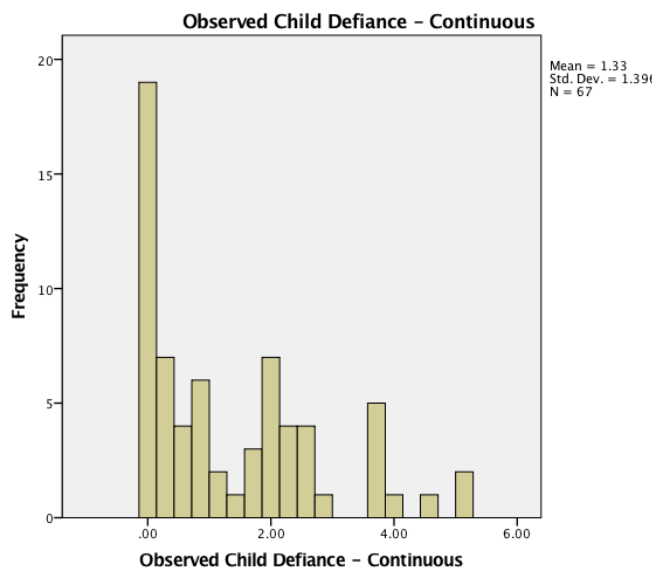
Distributions of parenting and child variables

“Don’t touch” Task: The distributions of the independent variables derived from this observational measure in a series of histograms. It can be seen that all three of the continuous variables were negatively skewed: Observed Harsh Physical Discipline (Skewness = 0.59); Observed Physical Guidance (1.97); Observed Verbal Guidance (0.99). For the Observed Harsh Verbal Discipline Binary, 54/69 (78.26%) scored 0, and 21.74% scored 1. The distribution of the outcome variable, Observed Child Defiance, is also shown in a histogram.

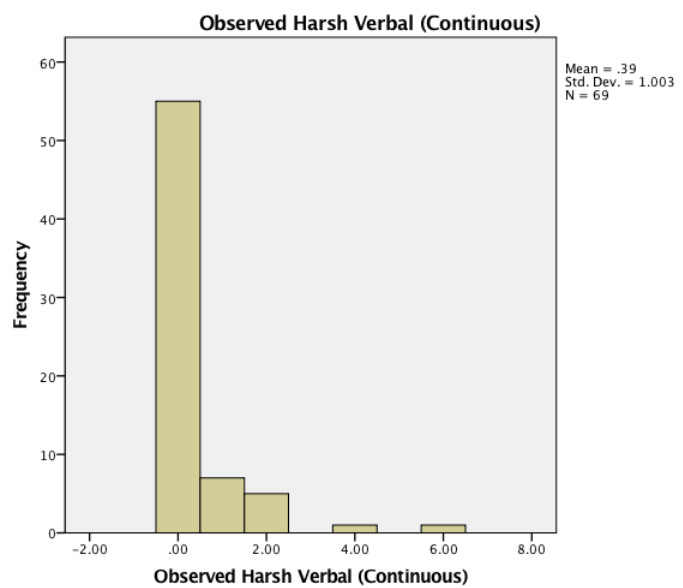
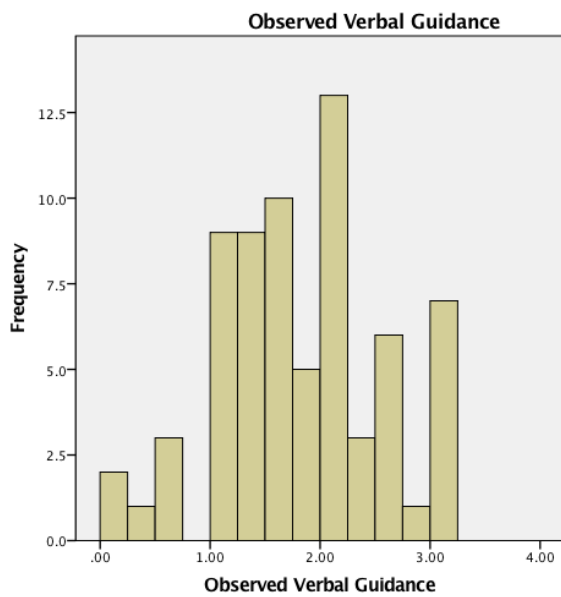
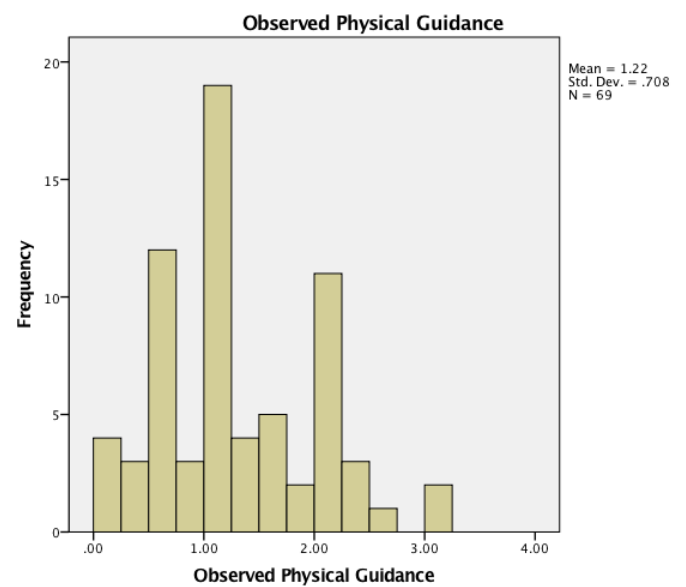
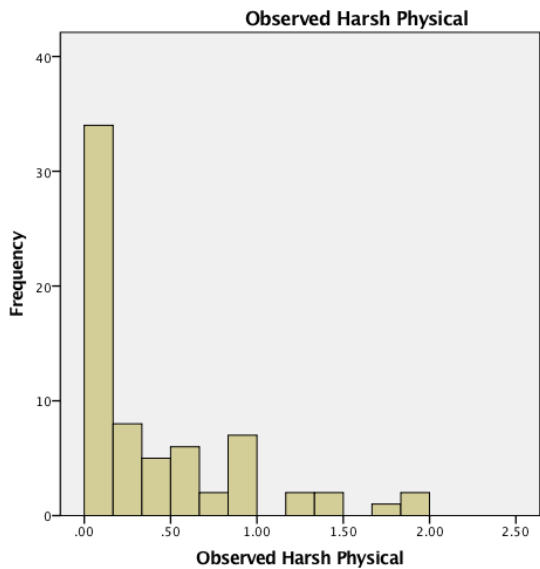


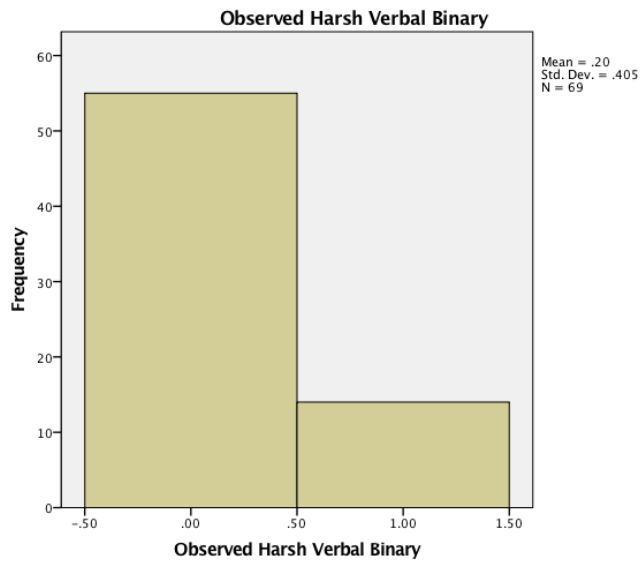


The distributions of the continuous Observed Child Defiance (“Don’t touch”) variable and the final, ordinal variable are shown in histograms:

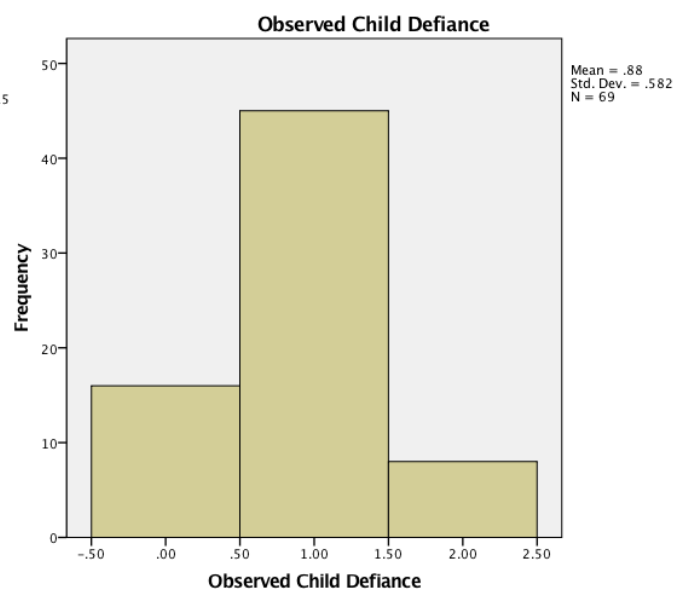
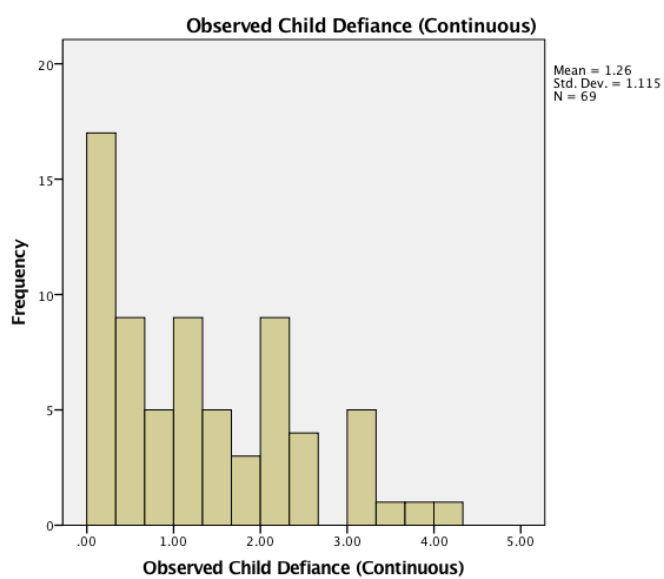


“Clean up” Task: The distributions of the independent variables derived from this observational measure in a series of histograms. It can be seen that Observed Harsh Physical Discipline was negatively skewed (Skewness = 1.32). The other two parenting variables were fairly normally distributed: Observed Physical Guidance (0.45); Observed Verbal Guidance (-0.1). For the Observed Harsh Verbal Discipline Binary, 55/67 (82.09%) scored 0, and 17.91% scored 1.





“Clean up” task: As a continuous variable, Observed Child Defiance was also negatively skewed (0.57). The distributions of the continuous Observed Child Defiance variable and the final ordinal variable are shown in histograms:



Appendix I
Descriptive Statistics in Tables

“Don’t Touch” Descriptive Statistics (N = 67)

	<i>M</i>	<i>SD</i>
Harsh Physical Observed	.60	.60
Physical Guidance Observed	.27	.38
Verbal Guidance Observed	.80	.92
Harsh Verbal Observed (binary)	.19	.40
Child Defiance Observed	.85	.63

“Clean Up” & Reported Variables Descriptive Statistics (N = 69)

	<i>M</i>	<i>SD</i>
Harsh Physical Observed	.41	.53
Physical Guidance Observed	1.22	.71
Verbal Guidance Observed	1.74	.74
Harsh Verbal Observed (binary)	.20	.41
Child Defiance Observed	.88	.58

Reported Variables Descriptive Statistics (N=69)

	<i>M</i>	<i>SD</i>
Physically Violent Discipline Reported	1.28	1.37
Psychologically Aggressive Discipline Reported	.29	.55
Non-Violent Discipline Reported	1.09	.90
CBCL Aggression/Defiance Reported (Cut off Binary)	.23	.43

Appendix J

Moderation effect of Child Gender

“Don’t touch” parenting predicting “Don’t touch” child defiance:

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	121.262			
Final	54.525	66.74	6	.000

Link function: Logit.

“Don’t touch” parenting predicting “Don’t touch” child defiance

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	Child Defiance=0	-.36	1.32	.07	1	.787	-2.94	2.22
	Child Defiance=1	9.02	2.46	13.42	1	.000	4.19	13.85
	Harsh Verbal=0	-1.71	1.16	2.16	1	.142	-3.99	.57
	Harsh Verbal=1	0 ^a	.	.	0	.	.	.
	Gender=0	1.05	.82	1.62	1	.203	-.56	2.66
	Gender=1	0 ^a	.	.	0	.	.	.
Location	Harsh Physical	7.93	2.06	14.74	1	.000	3.88	11.97
	Physical Guidance	.12	1.08	.01	1	.911	-2.01	2.25
	Verbal Guidance	-.02	.37	.00	1	.952	-.75	.70
	Gender=0 * Harsh Physical	-1.80	1.22	2.20	1	.138	-4.19	.58
	Gender=1 * Harsh Physical	0 ^a	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

The overall model was statistically significant ($X(6) = 66.74, p < .001$), however, within the model, the moderation between Gender and Harsh Physical Discipline was not ($b = -1.80, SE = 1.22, 95\% CI = -4.19-0.58, p = .138$).

“Clean up” parenting predicting “Clean up” child defiance:

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	119.71			
Final	81.14	38.58	6	.000

Link function: Logit.

“Clean up” parenting predicting “Clean up” child defiance

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	Child Defiance=0	-3.77	1.39	7.30	1	.007	-6.50	-1.04
	Child Defiance=1	2.11	1.27	2.75	1	.097	-.38	4.60
	Harsh Verbal=0	-1.91	.97	3.91	1	.048	-3.80	-.02
	Harsh Verbal=1	0 ^a	.	.	0	.	.	.
	Gender=0	.21	.68	.09	1	.761	-1.13	1.55
	Gender=1	0 ^a	.	.	0	.	.	.
Location	Harsh Physical	1.92	1.31	2.14	1	.144	-.65	4.49
	Physical Guidance	-.58	.48	1.50	1	.221	-1.52	.35
	Verbal Guidance	-.36	.44	.68	1	.409	-1.23	.50
	Gender=0* Harsh Physical	1.23	1.45	.72	1	.396	-1.61	4.06
	Gender=1 * Harsh Physical	0 ^a	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

The overall model was statistically significant ($X(6) = 38.58, p < .001$), however, within the model, the moderation between Gender and Harsh Physical Discipline was not ($b = 1.23, SE = 1.45, 95\% CI = -1.61-4.06, p = .396$).

“Don’t touch” parenting predicting reported child aggression/defiance (CBCL):

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	9.23	6	.161
	Block	9.23	6	.161
	Model	9.23	6	.161

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Harsh_Phys_Obs	.77	1.13	.46	1	.497	2.157
	Phys_Guid_Obs	.80	.92	.77	1	.382	2.233
	Verb_Guid_Obs	-.90	.53	2.88	1	.090	.408
	Harsh_Verbal#_Obs(1)	1.51	.85	3.19	1	.074	4.529
	Gender(1)	.76	1.04	.54	1	.462	2.145
	Gender(1) by Harsh_Phys_Obs	-.57	1.27	.20	1	.654	.565
	Constant	-1.97	.85	5.39	1	.020	.140

a. Variable(s) entered on step 1: Harsh_Phys_Obs, Phys_Guid_Obs, Verb_Guid_Obs, Harsh_Verbal#_Obs, Gender, Gender * Harsh_Phys_Obs .

The overall model was not statistically significant ($X(6) = 9.23, p = .161$), and further, within the model, the moderation between Gender and Harsh Physical Discipline was also not significant ($B = -1.97, SE = 0.85, p = .396$).

“Clean up” parenting predicting reported child aggression/defiance (CBCL):

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	15.43	6	.017
	Block	15.43	6	.017
	Model	15.43	6	.017

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Gender(1)	1.07	.82	1.71	1	.191	2.92
	Harsh Physical	-1.42	1.71	.69	1	.407	.24
	Physical Guidance	-1.12	.62	3.32	1	.068	.33
	Verbal Guidance	-.78	.51	2.38	1	.123	.46
	Harsh Verbal(1)	.60	.88	.46	1	.496	1.82
	Gender(1) by Harsh Physical	-1.36	1.95	.49	1	.484	.26
	Constant	1.42	1.18	1.45	1	.228	4.12

a. Variable(s) entered on step 1: Gender, Harsh_Phys_Obs, Phys_Guid_Obs, Verb_Guid_Obs, Harsh_Verbal#_Obs, Gender * Harsh_Phys_Obs .

The overall model was statistically significant ($X(6) = 15.43, p = .017$), however within the model, the moderation between Gender and Harsh Physical Discipline was not significant ($B = -1.36, SE = 1.95, p = .484$).

Reported Parenting predicting “Don’t touch” child defiance

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	89.976			
Final	81.27	8.71	5	.121

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	Child Defiance=0	-.13	.60	.05	1	.824	-1.30	1.04
	Child Defiance=1	2.96	.72	17.12	1	.000	1.56	4.36
	Gender=0	1.54	.70	4.82	1	.028	.17	2.93
	Gender=1	0 ^a	.	.	0	.	.	.
Location	Physically Violent	.40	.33	1.51	1	.219	-.24	1.05
	Psych_Agg_Disc_Rep	.85	.54	2.47	1	.116	-.21	1.91
	NonViolent_Disc_Rep	-.27	.28	.89	1	.345	-.82	.29
	Gender=0 * Physically Violent	-.53	.41	1.68	1	.196	-1.34	.27
	Gender=1 * Physically Violent	0 ^a	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

The overall model was not statistically significant ($X(5) = 8.71, p = .121$), and further, within the model, the moderation between Gender and Harsh Physical Discipline was also not significant ($b = -0.53, SE = 0.41, p = .196$).

Reported Parenting predicting “Clean up” child defiance:

Overall model

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	77.91			
Final	68.60	9.31	5	.097

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	Child Defiance =0	-.58	.60	.94	1	.334	-1.76	.60
	Child Defiance = 1	3.07	.75	16.90	1	.000	1.61	4.54
	Gender=0	.91	.71	1.66	1	.198	-.47	2.29
	Gender=1	0 ^a	.	.	0	.	.	.
Location	Physically Violent	.29	.32	.83	1	.361	-.33	.91
	Psychologically Aggressive	-.13	.51	.06	1	.804	-1.13	.88
	NonViolent	-.18	.29	.37	1	.546	-.75	.39
	Gender=0 *	.16	.40	.16	1	.688	-.62	.94
	Physically Violent	.16	.40	.16	1	.688	-.62	.94
	Gender=1 *	0 ^a	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

The overall model was not statistically significant ($X(5) = 9.31, p = .097$), and further, within the model, the moderation between Gender and Harsh Physical Discipline was also not significant ($b = 0.16, SE = 0.40, p = .688$).

Reported parenting predicting reported child aggression/defiance (CBCL)

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	14.60	5	.012
	Block	14.60	5	.012
	Model	14.60	5	.012

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Gender(1)	2.16	1.09	3.95	1	.047	8.70
	Physically Violent	.76	.46	2.73	1	.099	2.13
	Psychologically Aggressive	1.71	.67	6.48	1	.011	5.51
	Non-Violent	-.48	.40	1.48	1	.223	.62
	Gender(1) by Physically Violent	-1.07	.56	3.68	1	.055	.34
	Constant	-2.83	1.00	8.02	1	.005	.06

a. Variable(s) entered on step 1: Gender, Phys_Violent_Disc_Rep, Psych_Agg_Disc_Rep, NonViolent_Disc_Rep, Gender * Phys_Violent_Disc_Rep .

The overall model was statistically significant ($X(5) = 14.60, p = .012$), however within the model, the moderation between Gender and Harsh Physical Discipline was not significant ($B = -1.07, SE = 0.56, p = .055$).