

Screening for behavioral disorders with the Dyadic Parent-Child Interaction Coding

System: Sensitivity, specificity, and core discriminative components

Screening for behavioral disorders with the Dyadic Parent-Child Interaction Coding System: Sensitivity, specificity, and core discriminative components.

Parent-Child Interaction Therapy (PCIT) is a behavioral therapy where the essence is to teach parents to interact differently with their children in order to lessen their symptoms of behavioral disorders. Several clinical trials support the efficacy of the therapy (Eyberg, Nelson, & Boggs, 2008). The parent-child interaction addressed in PCIT is measured by means of the Dyadic Parent-Child Interaction Coding System (Eyberg, Nelson, Duke, & Boggs, 2005). Therapy continues until a specific criterion on the DPICS is reached. Thus, the therapy rests upon the proposition that there is a strong relation between parent-child interaction as measured by the DPICS and behavioral disorders, (i.e., oppositional defiant disorder [ODD] and conduct disorder [CD]). The original validity study of the DPICS conducted by Robinson and Eyberg, (1981) provides support for this notion. This study found that the DPICS scores among parents of children referred for behavioral problems differed from those of parents of normal children.

Additional evidence also comes from studies examining conditions related to behavioral disorders. Harsh parenting practices (Afifi, Mota, Dasiewicz, MacMillan, & Sareen, 2012) and physical abuse (Murray & Farrington, 2010) are predictive of ODD and CD. Furthermore, two different studies comparing physical abusive mothers with non-abusive mothers showed that physically abusive mothers had less favorable scores on the DPICS than non-abusive mothers (Aragona & Eyberg, 1981; Borrego, Timmer, Urquiza, & Follette, 2004). A substantial number of children referred for behavioral disorders do not receive a behavioral disorder diagnosis (Keenan & Wakschlag, 2004) and most children who experience maltreatment or abuse do not develop behavioral disorders (Afifi et al., 2012; Grasso, Ford, & Briggs-Gowan, 2013; Nanni, Uher, & Danese, 2012). Since there are no specific studies on the two most prominent behavioral disorders, ODD and CD, we therefore at present do not know whether DPICS discriminates between children with ODD/CD and those without.

Generally, there is a trade-off between sensitivity (the proportion of true cases which is screened positive) and specificity (number of true negatives which are ruled out by the screening). By lowering the cut-off one may capture more true cases, but only at the expense of including more false negatives. Receiver Operating Characteristics is a statistical technique which may aid the decision on choosing an optimal cut-off, balancing sensitivity and specificity. Although there are indications that the DPICS may discriminate between parents of children with behavioral disorders and parents of typically developing children in statistical terms, we do not know the discriminative power of DPICS as traditionally measured by ROC analysis, its specificity and sensitivity. We will, therefore, assess these aspects of the DPICS for the first time.

As a first step we will check the extent to which a global DPICS score will predict ODD/CD. If such a global score performs non-optimally, it may be because some codes are essential to ODD/CD and other codes are less important. By combining all codes the discriminative power of DPICS may be blurred. Rather, in order to capture the many nuances of parent-child interaction, the DPICS is a scoring system that is both complex and detailed. The level of detail obtained through the DPICS is common to a wide range of other scoring systems of parent-child interaction (Aksan, Kochanska, & Ortmann, 2006; Biringen & Easterbrooks, 2012a). However, different aspects of parent and child communication may be important for different outcomes. Regarding behavioral disorders, VI MÅ SKRIVE OM DETTE: we do not know whether all DPICS codes are equally important to discriminate between families of children with behavioral disorders and families of children without such disorders. Although discrimination does not by itself indicate causality, it may be a first step in narrowing down the aspects of parent-child interaction that may be important for the development, maintenance, or decline of behavioral disorders. If only a few elements of the DPICS are indeed discriminative of behavioral disorders, these elements could serve as a

starting point for future longitudinal research or efforts to refine treatment further. For example if parents of children with ODD/CD did praise their children equally often as parents of children without ODD/CD, it would be worthwhile to investigate if parental praise protect against future ODD/CD, increase the probability of remitting from ODD/CD or if putting less emphasis on coaching parents to praise their children more in PCIT would alter the success rate of PCIT.

Many parenting behaviors can be described on a continuum ranging from negative (e.g., coldness) to positive (e.g., warmth). However, other types of parenting behaviors are orthogonal rather than two points on a single dimension. For example, corporal punishment of transgression does not have a positive counterpart, merely the lack of physical punishment. Similarly, as we understand it, the negative counterpart of a positive touch, such as a gentle stroke or a hug, will merely be the lack of this kind of physical affection. Research on the relative importance of positive versus negative behavior on the DPICS yields a conflicting picture. One study found that both negative and positive parenting codes discriminated between mothers of children with behavioral problems and controls (Aragona & Eyberg, 1981) whereas another study found only positive behavior to discriminate between a group with problems (i.e., abusive parents) and controls (Borrego et al., 2004). Conversely, several studies have found negative communication from parents (i.e., critical statements and commands) and not positive communication to discriminate between parents of children referred for conduct problems and non-referred children (McCabe, Yeh, Lau, Argote, & Liang, 2010; Robinson & Eyberg, 1981; Webster-Stratton & Lindsay, 1999) and parents of children with conduct problems and controls (Webster-Stratton & Hammond, 1999). However, these analyses have only been performed bi-variately. Negative and positive parenting are expected to be strongly negatively correlated (Callahan & Eyberg, 2010). If finding both negative and positive individual codes to discriminate, we would not know whether the ability of positive parent communication to discriminate between those with ODD and those without is merely a

reflection of positive parenting's inverse correlation with negative parenting, and *vice versa*. Hence, multivariate research is needed to determine the relative importance of positive versus negative codes.

Such multivariate analyses have not been performed on the DPICS. In analyses other coding schemes, negative parenting often stands out as the stronger predictor of externalizing behavior in children when positive parenting and negative parenting have been included in the same model, or their relative merits compared, (Lavigne, Gouze, Hopkins, Bryant, & LeBailly, 2012; Pettit, Dodge, & Bates, 1993; Smeekens, Riksen-Walraven, & van Bakel, 2007). Although, exception do exist showing stronger effects of positive parenting (Smith, Calkins, Keane, Anastopoulos, & Shelton, 2004). In the present research we therefore hypothesized that (a) the DPICS would effectively discriminate between children with ODD and/or CD and children without psychiatric disorders, and (b) negative parenting would be the parenting codes that discriminated the best between these two groups of children.

## **Method**

### **Participants**

The participants were drawn from two different samples. The ODD/CD group were consisted of children aged 2 to 7 years, mean age=5.7 years, SD=1.3, consecutively referred for behavioral disorders to two child and adolescent mental health specialty (CAMHS) outpatient clinics in Mid-Norway. They were diagnosed with ODD (n = 31), CD (n=17) on the Preschool Age Psychiatric Assessment (PAPA; Egger et al., 2006). Due to comorbidity (n = 12), there were 36 children with ODD or CD. Exclusion criteria was suspected autism spectrum disorders (n=2).

The no diagnosis group (n=122) was randomly drawn from a representative community study of 995 4 and 6-year olds in the same geographical region Their parents were interviewed with the PAPA and the presence of ODD, CD, anxiety disorders, ADHD, sleep disorders, elimination disorders, autism spectrum disorders, and elimination disorders was

negative (Wichstrom et al., 2012), mean age=5.00, SD=1.3. Descriptive information on the sample is shown in Table 1.

### **Procedure**

The observation of parent-child interaction for coding with the DPICS was conducted at the CAMHS or university clinics. The administration of the parent-child interaction tasks were conducted according to the DPICS manual (Eyberg et al., 2005). The two administrators of the CAMHS part of the study were trained in Parent-Child Interaction Therapy including the DPICS by Dr. S. Eyberg and the second author. The DPICS was recorded in a clinical setting, and videotaped for later scoring. The videotapes were coded by trained observers naive to diagnostic status and study hypotheses. These coders underwent a rigorous training process and reliable coding of two video-recordings before they started coding. Reliability checks (80% agreement required to proceed) to avoid rater drift was taken after completion of every 25<sup>th</sup> video recording throughout the coding process. In a similar fashion, bi-weekly practice meetings were held to maintain consistency in coding. Parents were interviewed with the PAPA (Egger et al., 2006) at the clinic approximately three weeks after parent-child interaction observation.

### **Instruments**

**Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Duke, & Boggs, 2005).** The DPICS is a behavioral observation system designed to assess the quality of parent-child social interactions. It consists of three five-minute standard situations that vary in the degree of control required by the parent, and increases in demands placed on the child. The parent behaviors of interest are those that express reciprocity, nurturance, and parental control that serve to increase child reciprocity and cooperative social behaviors. The observations are conducted in three standard parent-child interaction situations, Child Led Play (CLP), Parent Led Play (PLP), and Clean-Up (CU). Verbalization, vocalization, and physical behavior categories are coded for both parent and child in each of these situations.

The scoring system used, DPICS III (Eyberg et al., 2005) consists of 18 parent and 8 child categories. Table 2 provides details on the various categories. In this study, we included Child Laugh from the supplemental categories in addition. Three trained graduate students in psychology naive to all information concerning the family scored the interaction from videotapes. Ten percent of the DPICS recordings in CLP, PLP and CU were rescored by multiple naive raters, resulting in 217 recodings of 96 codes, N=20,832 codes. The overall inter-rater reliabilities between multiple pairs of coders across CLP, PLP and CU for the various codes across CLP, PLP and CU are portrayed in Table 2. The reliability across utterances was ICC=.83.

**The Preschool Age Psychiatric Assessment (Egger et al., 2006).** The PAPA is a semi-structured psychiatric interview for completion by caregivers (93.6% parents, .6% adoptive parents, 5.8% foster parents; 79.5% female) of preschool or young school age children. The PAPA uses a structured protocol involving both required questions and optional follow-up questions. Interviewers continue to probe until there is enough information to decide whether the symptom is present at pre-specified levels of severity. If so, its onset date is recorded along with its frequency of occurrence when relevant. The assessment of impairment in 19 areas of functioning resulting from each group of symptoms was based upon the World Health Organization's International Classification of Functioning, Disability and Health (World Health Organization, 2001). When a symptom was recorded as being present, potential resulting impairment was evaluated in three different settings (i.e., home, day-care, or other settings). A three month primary period is used for identification of symptoms. Children who fulfilled the symptom, onset, duration, and impairment criteria in DSM-IV received a diagnosis. The inter-rater reliability of the Norwegian PAPA used in this study has been reported previously (ODD  $k = .89$ ; CD  $k = .78$ ) (Wichstrøm et al., 2012)

## Results

Table 2 presents an overview of the mean scores of each DPICS category for the whole sample, the ODD/CD group and the group with no diagnoses. Neutral Talk from parents and Prosocial Talk from children were by far the most prevalent categories, followed by Descriptive Questions from parents and Questions from the child. Other categories were infrequent such as touch-categories and Whine. The following categories discriminated between children with and without behavioral disorders: Negative Talk, Negative Touch, Indirect Command with Compliance, Indirect Command with no opportunity for the child to comply, Direct Command with Compliance, Direct Command with no opportunity to comply, and Commands from the child. Parents of children with ODD/CD generally gave more commands, almost irrespective of their form. On average, the total number of commands given by parents was 34.40 in the ODD/CD group and 21.60 in the no-diagnosis group,  $t(154)=5.27, p < .001$  (i.e., 60% more in the clinical group).

Because the implications of giving commands and responding to them may be different in Child Led Play, Parent Led Play and Clean-Up, differences between ODD/CD and the no-diagnosis groups were analyzed in each sequence. The results are shown in Table 3. The ODD/CD parents had more Direct Commands with child Compliance in PLP and CU, but not in CLP. Additionally, ODD/CD parents had more Direct Commands with no child Compliance in PLP and more Direct Commands with no opportunity for the child to comply in all settings. The latter finding concerning no opportunity to comply was also found with respect to Indirect Commands, and Indirect Commands with Compliance were also more prevalent in ODD/CD families in PLP.

Regarding child Commands directed towards parents, children with no diagnosis had almost twice as many as compared to the children with ODD/CD in the CLP situation. It should also be noted that the standard deviations often were much larger in the ODD/CD group than in the no diagnosis group, specifically with respect to Direct Commands with no Compliance in PLP (Levene's test  $F = 21.42, p < .001$ ), Direct Commands with Compliance



in PLP (Levene's test  $F = 8.35$ ,  $p = .004$ ), Direct commands with no opportunity to comply in CLP (Levene's test  $F = 7.09$ ,  $p = .009$ ), and Direct Commands with Compliance in PLP (Levene's test  $F = 6.91$ ,  $p = .009$ ). Taken together, this indicates that ODD/CD parents exhibited greater variability in these behaviors than parents of children with no diagnosis.

The screening efficiency of the DPICS was evaluated using Receiver Operating Characteristic Curve (ROC) analysis, which determines the area under the curve (AUC) for the DPICS against the diagnostic groups. The AUC expresses the probability that a randomly chosen subject with a disorder and a randomly chosen subject without a disorder would be correctly distinguished based on their screening scale scores. According to Hosmer and Lemeshow (2000)  $AUC=0.5$  implies no discrimination,  $0.7 \leq AUC < 0.8$  represents acceptable discrimination,  $0.8 \leq AUC < 0.9$  excellent discrimination, and  $AUC \geq 0.9$  outstanding discrimination. Because of substantial differences in the frequency between codes, these differences had to be adjusted for when a total DPICS score was computed. Therefore, all codes were z-transformed to equal their weight. Further, some scores denote positive behavior whereas others denote negative behavior. The total DPICS score was therefore created as the mean of all z-transformed negative codes minus the mean of all z-transformed positive scores.

Results showed that this total DPICS score poorly discriminated the ODD/CD children from the children with no diagnosis,  $AUC = .58$ , 95% CI: .47 - .68. The first part of PCIT, the Child-Directed Interaction where parents are trained in sensitive interaction with their child, is stopped when a criterion of 10 labeled praises, 10 reflections, 10 behavior descriptions, and less than 3 questions, commands, and negative statements from the parent to the child is reached. We thus created a summative score of these codes and checked whether this would adequately discriminate between ODD/CD and no diagnosis, but it did not,  $AUC = .61$ , 95% CI: .55 - .67.

To determine which DPICS codes best predicted ODD/CD, a multiple logistic regression was therefore performed with forward inclusion according to Log likelihood ratio.

The resulting model fitted the data well, Hosmer and Lemeshow test  $\chi^2 = 8.23$ ,  $df=8$ ,  $p=.41$ , and included four DPICS codes predicting ODD/CD the best (Table 4). Parental Negative Talk, parental Direct Command with child Compliance, and parental Indirect Command with no opportunity to comply increased the risk of ODD/CD, whereas child Commands decreased this risk. A sum score of these discriminating variables, with child Commands reversed, was subjected to a ROC analysis. This abbreviated DPICS score evidenced excellent discrimination,  $AUC = .85$ , 95% CI: .79 - .92.

The sensitivity/specificity pairs generated through the ROC analysis were further used to select a threshold for identification of clinical cases. At a given cut-point sensitivity shows the proportion who receives a positive screen among diagnosed positives, whereas specificity shows the proportion of true negative cases defined as true negatives by the test. Table 4 shows the corresponding sensitivity and specificity for varying cut-points of the abbreviated DPICS scale. No specific value appeared to provide a clear advantage with respect to the trade-off between sensitivity and specificity. In a clinical setting, however, it would be more important to detect those with ODD/CD than to rule out ODD/CD. At a scale value of 6, 85% of true positive ODD/CD children would be found whereas 70% of true negatives would be correctly classified, which might represent a reasonable trade-off.

### **Discussion**

In this study we predicted that the DPICS would discriminate between children with ODD/CD and those without a diagnosis. Furthermore, we hypothesized that negative parenting codes would discriminate the best between these two groups. The results showed that a total DPICS score was not able to discriminate between those with ODD/CD and those without. Three negative parent codes (i.e., Negative Talk, Indirect Command with no opportunity to comply, and Direct Command with Compliance), and one child category (i.e., Command) multivariately predicted ODD/CD. A scale consisting of these four codes evidenced excellent screening efficiency. In this sense, evidence was provided in support of both hypotheses.

Analyses showed that the majority of DPICS codes, often the most prevalent and positive ones, were equally often found in families of a child with ODD/CD as in families with no diagnosis, which replicates the findings of others (McCabe et al., 2010). As a sum-score, the total DPICS score will reflect the prevalent codes the most, which are mostly positive and neutral codes, leaving the negative and less frequent codes to have little impact on the overall score. For example, Neutral talk in the present sample outnumbered Negative talk at a rate of 25:1. Because positive and neutral codes did not add discriminative value, one would not expect the total DPICS score to discriminate between those with diagnosis and those without.

The findings of this study showed that a set of rather infrequent and negative parenting codes were highly efficient in discriminating children with ODD/CD and those without. A closer look at these discriminating categories showed that Negative talk had the greatest discriminating power, which is generally reflected in the literature (McCabe et al., 2010; Patterson, DeBaryshe, & Ramsey, 1989; Robinson & Eyberg, 1981). A large body of research indicates that the relationship between parental negativity and child conduct problems is a bi-directional one (Larsson, Viding, Rijdsdijk, & Plomin, 2008), but follow-up research is needed to determine if this is the case for DPICS-coded parental negativity as well. Reducing negative talk is one of the aims of PCIT, but at present, we do not know if this is one of the effective components of this therapy.

Further, the results from our study showed that the parents of ODD/CD children gave 60% more commands than parents of children with no diagnosis. These differences were most evident in PLP, which is in accordance with a review of Roberts (2001). In the present research, parents of children with ODD/CD gave twice as many Direct Commands as parents of children with no diagnosis and gave more Indirect Commands with no opportunity for the child to comply. Thus, it appears that when parents are responsible for leading a child during an activity, parents of children with ODD/CD do so by increasing their frequency of commands. In the DPICS manual, direct commands are seen as part of positive leading

because these commands provide a clear communication to the child of parental expectations. It is, therefore, easier for the child to comply with direct rather than indirect commands. Thus, at first glance, it may seem counterintuitive that parents of children with ODD/CD increase their positive leading more than parents of children with no diagnosis when it is required of them. Further, there were little or no signs of coercive processes because ODD/CD children often complied with these commands. However, the difference in rate of commands may reflect different leading styles, and leading by means of commands may be seen as leading the child by external motivation. Parents of typically developing children, however, may lead by engaging the child in the task/play, thus making the child want to join their activity. With this kind of internal motivation, one might expect that few commands are necessary. This is in accordance with results showing that parents who enjoy their role as parent use fewer direct commands but apply positive incentives instead (Kochanska, Kuczynski, & Radkeyarrow, 1989). One of the goals of PCIT is to increase the emotional engagement of the parent (i.e., ‘Enjoyment’), and such enjoyment of interaction and play may increase the child’s inner motivation to play with the parent – also on the parent’s terms. However, Enjoyment is merely noted in PCIT and not part of the DPICS. Thus, ratings of Enjoyment might be important to consider in future revisions of the DPICS.

The children with ODD/CD showed a higher degree of immediate compliance to direct commands. A possible explanation for this finding might be that a higher frequency of direct commands will increase the opportunities to comply. Alternatively compliance might be seen as a result of former negative consequences from the parent following non-compliance. Some studies have reported positive correlations between child compliance and children’s anticipation of negative consequences, level of control attempted by a parent and physical punishment (Afifi et al., 2012). This is important to bear in mind, since compliance is usually seen as a positive element of child responsiveness (Biringen & Easterbrooks, 2012b).

The only significantly discriminating child category was Commands; statements in which the child directs the parents' behavior (e.g., "Give me a car," "Let's put the tiger together"). High prevalence of commands seems to reflect a child who continuously gets new ideas, and actively includes the parent in the play. Children with ODD/CD had fewer commands than children with no diagnosis, but this difference was only evident in CLP. Our findings are in accordance with evidence showing that children with externalizing disorders exhibit less self-regulated play (Roberts, 2001) and fewer dominance behaviors than non-clinic children (Webster-Stratton, 1985). This might reflect that children with ODD/CD show a lack of engagement in the play and less initiative to keep the parent active and engaged.

Observational instruments for identifying behavioral problems or disorders are emerging in both research and clinical practice, and there is accumulating evidence for the reliability and validity of many of these systems for discriminating between clinic and non-clinic groups of children. These observational instruments include the Observational Assessment of Preschool Behavior (DB-DOS; Wakschlag, Briggs-Gowan, et al., 2008; Wakschlag, Hill, et al., 2008), the Parenting Clinical Observation Schedule (P-COS; Hill, Maskowitz, Danis, & Wakschlag, 2008), Parent Instruction-Giving Game with Youngsters (Piggy; Hupp, Reitman, Forde, Shriver, & Kelley, 2008) and the Standardized Observation Analogue procedure (SOAP; Johnson et al., 2009). Some of these aims to identify behavioral problems in children (e.g., the DB-DOS) whereas others aim at classifying parent-child interaction or parenting which in turn may identify children with behavioral problems. To date, no existing study has examined the efficiency of the observational measures in question by using sensitivity and specificity as indicators. It has thus been difficult to pinpoint exactly the degree of efficiency of these measures. The present study, however, showed that the DPICS has a discriminating power at least equaling that of commonly used screening instruments such as the Child Behavior Checklist (CBCL; Rescorla et al., 2007) and the Strength and Difficulties Questionnaire

(SDQ; Biederman, Ball, Monuteaux, Kaiser, & Faraone, 2008) Future research will determine if the DPICS adds to the screening efficiency of such questionnaires.

Because observational instruments such as the DPICS are time-consuming and expensive, one might argue that less time consuming instrument (e.g., CBCL, SDQ) should be preferred. Nevertheless, questionnaire type instrument typically only characterize child behavior and they might therefore be of limited value in guiding interventions. The DPICS, however, details the areas which should be targeted in therapy. Thus, using an etiologically and directly therapeutically relevant instrument such as DPICS conveys the combination of an effective screening and guidance for therapy. On the other hand, several observation instruments, including the DPICS, are detailed and assume advanced coding skills that are discordant with clinical practice, and to simplify the instruments for clinical use is recommended (Mash & Foster, 2001). One of the advantages of the DPICS is that it already exists in an abbreviated version for clinical use. This makes it a useful instrument both for assessment and in monitoring the therapy from session to session, and it has shown to be sensitive to treatment effects during PCIT (Eyberg & Robinson, 1982). However, since PCIT mainly focuses on improving parenting skills, the clinical version of the DPICS does not code child behavior. Since the bidirectional processes between parenting and child antisocial behavior are best explained by both parent-driven and child-driven effects (Larsson et al., 2008), one of our suggestions is that the abbreviated DPICS should include some core components of child behavior in addition to compliance. One of the findings in this study was that children with ODD/CD gave fewer Commands to their parents in CLP. However further research on larger samples are needed to see if coding child Commands will help to evaluate if the child's vitality and playfulness increases as a result of therapy. Moreover, our results suggest that only a limited set of infrequent parent codes discriminated ODD/CD from no diagnosis. This does, however, not imply that these are the only relevant codes for treating ODD/CD. Future studies

on the dimensions of DPICS predicting change in ODD/CD is needed to further evaluate this issue.

Although the present study had many merits including the use of structured diagnostic interview and sampling control children from a known population of non-cases, the present results should be viewed in the context of several limitations. Although sensitivity and specificity are not dependent upon the prevalence in a population, we cannot rule out that the DPICS might screen differently in a solely clinical population or in a solely population sample. The present findings, stemming from a mixed clinical and population sample, should therefore be interpreted with caution. Even though the revised DPICS codes predicted ODD/CD, this should not be seen as indicating any causality. Because the study was conducted in Norway we also need to consider cross-national differences including prevalence of ODD/CD, referral practices, and parenting practices. We also need to take possible cross-cultural differences and differences in health care systems into account. Such differences might be reflected in which children are or are not referred to mental health clinics, and might possibly have affected our clinical population. Another possible limitation concerns cross-cultural differences in child-rearing practices. The Nordic countries are known to have democratic child-rearing practices, and parents are seen as more permissive (Foros & Vetlesen, 2012). We assume that this might have an impact on the amount of requests that parents place on a child in addition to differences in how they judge compliance. This tendency also shows in that the Norwegian norms on the ECBI (Reedtz et al., 2008), the CBCL (Rescorla et al., 2007) and the SDQ (Obel et al., 2004) are lower than the US norms. This might either reflect parents' reluctance to report problems (Rescorla et al., 2007), or that Norwegian parents consider child antisocial behavior as less of a problem than do US parents (Reedtz et al., 2008). Another limitation is that the diagnostic interview was conducted with only one of the parents, and we do not know how information from both parents would have affected the number of children diagnosed with ODD/CD.

In conclusion the present study suggests that a narrow number of negative parent DPICS codes, centered around negative talk and leading by means of giving commands, effectively discriminate between children with ODD/CD and no diagnosis. These differences in communication are particularly evident when parents are instructed to lead the play. Future studies, both experimental and observational, on the dimensions of DPICS predicting change in ODD/CD are needed to determine the potential etiological role of these specific aspects of negative parenting in the development, persistence and remittance of ODD and CD.

Table 1.

## Sample characteristics

<b>Characteristic</b>	<b>%</b>	
<b>Gender of child</b>	Male	49.1
	Female	50.9
<b>Gender of parent interacting with child</b>	Male	20.9
	Female	79.1
<b>Biological parents' marital status</b>	Married	48.7
	Cohabiting > 6 months	36.8
	Separated	0.7
	Divorced	7.2
	Widowed	0.0
	Cohabiting < 6 months	5.3
<b>Informant parent's socio-economic status</b>	Never lived together	1.3
	Leader	6.8
	Professional, higher level	27.7
	Professional, lower level	30.4
	Formally skilled worker	27.7
	Farmer/fisherman	0.7
<b>Parent's highest completed education</b>	Unskilled worker	4.7
	Not completed junior high school	0
	Not completed junior high school or junior high school (10 <sup>th</sup> grade)	1.9
	Some education after junior high school	7.7
	Senior high school (13 <sup>th</sup> grade)	16.8
	Some education after senior high school	4.5
	Some college or university education	8.4
	Bachelor degree	7.1
	College degree (3-4 years study)	28.4
	Master degree or similar	20.6
PhD ongoing or completed	4.5	



**Table 2**  
**Descriptive Statistics for DPICS-Categories; Parent-Child Interaction (Child-Led Play 5 minutes and Parent-Led Play, 5 minutes). Mean and Standard Deviation with T-scores.**

Categories	Interrater reliability (ICC)	Sample (N = 158)		ODD/CD (N = 3)		No Diagnoses (N = 122)		T-test		
		M	SD	M	SD	M	SD	t	Df	p
Parent										
Neutral Talk	.79	104.53	29.58	10 1. 75	30.07	105.3 4	29.52	- .64	156	.52
Descriptive Questions	.91	25.18	11.33	22 .6 1	11.39	25.93	11.25	- 1.55	156	.12
Behavioral Descriptions	.39	1.06	1.41	1. 39	1.78	.96	1.28	1.35	46.1 4	.18
Reflective Statements	.77	6.77	5.22	6. 28	5.07	6.91	5.28	- .64	156	.53
Unlabeled Praise	.75	4.62	4.16	4. 42	4.20	4.68	4.17	- .33	156	.74
Labeled Praise	.69	.28	.71	.2 5	.60	.30	.74	- .34	156	.74
Positive Touch	.59	.92	1.90	.9 4	2.10	.91	1.85	.10	156	.92
Negative Talk	.62	2.53	3.69	4. 97	5.48	1.81	2.58	3.36	39.6 9	<.0 01*
Negative Touch	.65	.49	1.41	1. 19	2.41	.29	.84	2.22	37.5 2	.03
Information-Question	.									
Answer	.83	5.21	3.35	4. 78	2.91	5.34	3.47	-.88	156	.38
No answer	.70	1.06	1.23	.7 2	1.09	1.16	1.26	- 1.91	156	.06
No opportunity	.82	1.97	1.95	2.	2.01	1.93	1.94	.48	156	.64

		11								
Indirect Command	.62									
Compliance		4.88	3.65	6.17	4.19	4.50	3.94	2.45	156	.02
No compliance	.78	2.15	2.31	2.31	2.55	2.10	2.24	.47	156	.64
No opportunity	.73	6.49	6.37	9.31	7.60	5.66	5.74	2.66	47.39	.01
Direct Command	.72									
Compliance	.85	4.83	3.29	6.69	3.69	4.28	2.97	3.60	49.16	<.001*
No compliance	.84	1.96	2.95	2.89	4.44	1.69	2.29	1.56	40.66	.13
No opportunity	?	4.23	4.27	6.42	4.96	3.58	3.84	3.16	48.01	<.0001*
Child										
Prosocial Talk	.81	85.65	29.22	78.36	33.16	87.80	27.73	1.71	156	.08
Questions	.94	11.34	6.34	9.97	7.70	10.85	5.83	1.77	156	.08
Laugh	.89	2.55	3.44	2.56	3.58	2.56	3.41	.00	156	.10
Command	.86	8.47	6.51	6.03	4.32	9.19	6.88	3.32	92.05	<.00*
Negative Talk	.77	2.62	1.94	5.61	6.90	3.31	4.43	1.89	43.85	.07
Negative Touch	.67	.26	.86	.47	1.42	.20	.60	1.13	38.71	.27
Whine	.77	1.51	3.68	2.11	4.63	1.34	3.36	1.10	156	.27
Yell	.84	.79	2.34	1.86	4.16	.48	1.27	1.97	36.95	.56

Note: When the variances in the two groups were unequal according to Levene's test, p-values and *dfs* have been adjusted accordingly, not assuming equality of variances.

Table 3  
Descriptive statistics for predictive DPICS-categories; Child Led Play, Parent Led Play and Clean-Up. Mean and standard deviation with t-scores

	ODD/CD (N=36)		No diagnosis (N=122)		t	T-test	
	M	SD	M	SD		Df	p

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Child Led Play							
Negative Talk	.69	1.12	.39	1.02	1.57	156	.12
Indirect Command							
Compliance	1.37	2.00	1.07	1.24	-.86	41.78	.40
No compliance	.31	.68	.26	.54	-.45	154	.65
No opportunity	1.94	2.87	1.18	1.70	-1.50	41.12	.14
Direct Command							
Compliance	.86	1.26	.79	1.13	-.29	154	.78
No compliance	.14	.43	.17	.45	.26	154	.80
No opportunity	1.23	1.90	.60	1.14	-1.86	41.31	.07
Child Command	2.37	2.56	4.67	4.67	3.79	103.94	<.000*
Parent Led Play							
Negative Talk	2.50	4.03	.70	1.17	4.37	36.76	.01
Indirect Command							
Compliance	3.40	2.61	2.16	2.31	-2.72	154	<.01*
No compliance	.97	1.60	.87	1.12	-.44	154	.66
No opportunity	4.31	4.36	2.78	3.75	-2.06	154	.04
Direct Command							
Compliance	2.60	2.66	1.44	1.83	-2.43	43.72	.02
No compliance	1.31	2.77	.49	.95	-1.73	36.33	.09
No opportunity	2.97	3.03	1.50	2.19	-2.67	44.71	.01
Child Command	2.00	2.43	2.93	2.86	1.74	154	.08
Clean-Up							
Negative Talk	1.78	2.96	.72	1.54	2.85	40.78	.05
Indirect Command							
Compliance	1.43	1.36	1.30	1.54	-.46	154	.65
No compliance	1.09	1.52	.96	1.57	-.43	154	.67
No opportunity	3.26	3.65	1.58	2.01	-2.61	40.15	.01
Direct Command							
Compliance	3.29	2.47	1.99	1.85	-2.89	45.56	<.01*
No compliance	1.51	2.38	1.02	1.82	-1.30	154	.19
No opportunity	2.40	2.65	1.45	2.33	-2.06	154	.04
Child Command	1.71	2.30	1.62	2.54	-.20	154	.84
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Note: When the variances in the two groups were unequal according to Levene's test, p-values and *dfs* have been adjusted accordingly, not assuming equality of variances.

Table 4

## DPICS Categories Predicting ODD or CD

DPICS category (z-score)	Adj O.R.	95% Confidence Interval		p
Parent Negative Talk	2.10	1.36	3.25	<.001
Parent Direct Commands with Child Compliance	1.88	1.20	2.95	.006
Parent Indirect Commands with no Opportunity for Child Compliance	1.79	1.11	2.89	.02
Child Commands	.33	.17	.66	.002

Note. OR= odds ratio

Table 5

## Receiver Operating Characteristics Analyses for the DPICS

DPICS Abbreviated Score	Sample proportion %	ODD or CD (n=36)	
		Sensitivity	Specificity
4	53.8	.91	.57
5	46.8	.91	.66
6	42.3	.85	.70
7	37.2	.77	.74
8	32.7	.71	.78
9	30.1	.68	.80
10	28.2	.65	.82
11	26.3	.62	.84
12	21.8	.59	.89

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