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Postpartum depression and pragmatic skills in children: a comparison between boys and girls from a low-income Brazilian population

Depressão pós-parto e habilidades pragmáticas: comparação entre gêneros de uma população brasileira de baixa renda

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ABSTRACT

Purpose: Compare pragmatic skills of boys and girls and the influence of Postpartum Depression (PPD) on this process. **Methods:** The subjects of this research project are 31 boys and 49 girls from 3 years to 3 years and 5 months. Regarding their mothers, 30 displayed PPD indicators as per the Edinburgh Postnatal Depression Scale. An assessment of the pragmatic aspect of child language development was carried out, at 3 years old, during open play with mother, based on data gathered since birth. **Results:** It was observed that girls obtained better results than boys, although those girls whose mothers had PPD interacted more. Boys, in contrast, had better results when their mothers did not have PPD. **Conclusion:** This led to the detection of the influence of gender on those socio-affective, upbringing-related variables (including PPD), which are relevant to child development.

Keywords: Language; Postpartum depression; Mother-child relations; Gender and health; Language tests

RESUMO

Objetivo: Comparar as habilidades pragmáticas de meninos e meninas e verificar a influência da depressão pós-parto (DPP) nesse processo. **Métodos:** Foram sujeitos desta pesquisa 31 meninos e 49 meninas de 3 anos a 3 anos e 5 meses de idade. Com relação às mães, 30 apresentaram indicativos de DPP, avaliada pela Escala de Depressão Pós-parto de Edinburgh. Foi realizada a avaliação do aspecto pragmático do desenvolvimento de linguagem das crianças aos 3 anos, durante brincadeira livre com a mãe, em função de dados colhidos desde o nascimento. **Resultados:** Foi observado que as meninas obtiveram melhores resultados que os meninos, porém, aquelas, cujas mães apresentavam DPP, interagiram mais. Já os meninos, obtiveram melhores resultados quando as mães não apresentavam DPP. **Conclusão:** Constatou-se a influência do gênero e das variáveis socioafetivas de criação, incluindo a DPP, no desenvolvimento das crianças.

Descritores: Linguagem; Depressão pós-parto; Relações mãe-filho; Gênero e saúde; Testes de linguagem

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INTRODUCTION

Postpartum depression (PPD) is a public health issue affecting both maternal health and child development. It is characterized by a depressive episode or a number of episodes after the birth of a child. PPD can be distinguished from other types of depression by a set of symptoms which usually begins four to eight weeks post-partum, reaching its highest intensity in the first six months[1]. It is estimated that ten to 15% of women display depressive symptoms during this postpartum period. However, different studies have shown variations to this rate, due to methodological and contextual issues[2-5].

There are many PPD-related symptoms, but some of the most prevalent ones are mood changes (depressive/irritable) or lack of interest/motivation, decreased energy and anhedonia (diminished or non-existent ability to feel pleasure in life or in enjoyable activities), frequent crying, feelings of guilt, changes in sleep patterns, fear of hurting the child, decreased libido and appetite, and an overall decrease in mental functioning. Other symptoms that may be present are: suicidal ideation and obsessive thoughts.

Different researchers[5-7] point to a set of risk factors related to PPD: a) pre-natal depression and anxiety; b) low self-esteem; c) difficulty in dealing with the baby; d) high stress levels; e) poor social support; f) poor marital relations; g) history of depression; and h) the presence of melancholia. Other factors that have been positively associated with PPD are: being a single mother, low socioeconomic status, unwanted or unplanned pregnancy, birth or pregnancy complications, premature birth, and giving birth to twins/multiples.

Postpartum depression is considered a risk factor because it may be detrimental to the mother-child bond and, since it compromises the mother's emotional and cognitive availability. Consequently, this creates a situation in which the mother is not adequately responsive to her child, due to a lack of contingency, engagement, and adjusted exchanges.

A wide array of psychological development studies acknowledge the importance of the first years of life to subsequent development[8-10]. Those first years are crucial to the acquisition of social, affective, and cognitive information, and it is also when there is a stabilization and proliferation of specific synapses, in detriment of others. If the infant is not adequately stimulated, especially by mother, the chances of damage to neurobiological and psychological processes increase significantly, leading to medium and long-term repercussions.

A longitudinal study following 1215 dyads from birth to 36-months found results that confirm the ones mentioned above[11]. This study, which investigated the behavioral, motor and mental development of children whose mothers either displayed depressive symptoms or not, demonstrated that children of chronically depressed mothers had significantly lower expressive language scores when interacting with their mothers. These, in turn, rated their children as less cooperative and as having more internalizing symptoms (depressive and anxious affect, shyness, somatic complaints) as well as more externalizing symptoms (aggressive and disruptive behavior) in comparison to the children in the non-depressed mothers cohort.

Language, according to many authors[12-14] develops from the interaction between child and environment. Parents incorporate a range of different behaviors into an interpersonal system of social exchanges[15]. Initial socialization plays a fundamental role in the language development of children. When parents display behaviors that are sensitive to the child's signs, they tend to benefit cognition and language acquisition. The role of the mother in this interaction is emphasized. The dialogue between mother and child is a primordial issue to language development, since the mother is considered the co-author of her child's communicative-linguistic development. Accordingly, children experience many different grammatical constructions through their mothers' speech, enriching their verbal repertoire, both in terms of emission and semantic apprehension .

Mothers adopt a peculiar manner of speaking to small children, which is different from adult speech, and indicates the mother's adaptation to the child's limited linguistic abilities. Mothers adjust their language to the child's cognitive and developmental level. These adjustments to maternal speech are characteristics of "motherese", a speech style which involves short and simple utterances, the presence of gestures to aid in communication, which seems to provide children with information; a pattern of marked modulation, simplified in form and content[9,16-18].

Supplementing the previous findings, researches[14] determined the extent to which maternal sensitivity and responsiveness contribute to the language learning experience in the process of interaction between the child`s language and that of the mother's. The aforementioned research has indicated that children's language development is extremely sensitive to the variety of environmental situations, including the availability and wealth of linguistic and cognitive stimulation in the hands of responsive and sensitive parents. Parental attitudes toward child behavior can influence the child's linguistic and speech development, both positively and negatively.

Conversely, this responsiveness during interactive contexts may be influenced by individual characteristics of each child, such as their linguistic and cognitive developmental level, age group, as well as the different strategies children apply to insert themselves into the linguistic system. However, one specific child trait has been singled out as potentially responsible for variations in dyadic interaction: gender.

There are few studies on different maternal speech styles based on the child's gender[18]. A literature review has shown that greater lexical production and syntactic complexity in maternal speech corresponds to a greater lexical output in both boys and girls, although girls do tend to speed up their vocabulary development, when compared to boys. It has also been observed that, during interaction, boys receive more negative feedback in their communication attempts than girls do. Girls,

on the other hand, tended to receive more positive feedbacks than boys for their attempts to join in dialogues. Girls receive more maternal incentives to speak than do boys, however, this discrepancy seems to disappear past five years of age.

Similar results have been related in other study[19]. Authors have found significant differences in maternal communicative behavior based on the child's gender. There were significant differences at the linguistic level, although boys and girls in this study displayed variations in their linguistic strategies and their effective participation when interacting with their mothers. Thus, child characteristics such as gender, may elicit specific interaction styles, not only due to the child's gender, but also as a consequence of the relationship established with their mothers.

Gender has also exerted a significant influence in postpartum depression and, consequently, the mother's availability to her child. A study demonstrated that a child's gender considerably influenced the mother's depressive symptoms and quality of life[20]. Contrary to findings present in the literature, which ascertain that, in some cultures, the rate of PPD is higher when associated with the birth of a female (since those require more financial resources, leave their houses to get married, birth control, etc.), the study found higher rates of stressors and depressive symptoms in mothers of boys. According to the authors, this is due to childhood experiences with the opposite sex or current/recent experiences the mother might have had with a male partner, and which may lead to major difficulties in relating to a baby boy.

Therefore, it has been observed that gender influences the mother's behavior toward the child, and consequently, the dyad's interactional process. The child's exposure to inadequate interactional styles poses different types of risks to his or her development. In this process, emphasis should be given to the importance of the mother-child interaction when it comes to the communicative-linguistic development of the child, and the consequences of PPD to such development.

Highlighting the relevant factors for child development, the present project is part of FAPESP's Thematic Project (No. 06/59192), known as *Projeto Ipê*: " Postpartum depression as a risk factor for infant development: an interdisciplinary study of factors involved in the genesis of the episode and its consequences". It is comprised of a longitudinal follow-up, which aims to assess implications of depressive symptomatology to the mother and the global development of the infant, based on general development and neuro-psycho-motor guidelines, as well as cortisol levels. The project also investigates the woman's condition in terms of motherhood and its challenges. It involves, therefore, areas of basic and clinical research, engaging a wide array of professionals from different fields related to PPD, stressing potential insights it might provide in terms of early intervention efforts.

Therefore, this study aimed to compare the pragmatical skills in boys and girls and determine the influence of postpartum depression on this process. The analysis of these effects is considered within a broader context of variables related to family composition and social support, which allowed for an in-depth understanding of the subjacent factors. These investigations will allow us to understand the functionality of the language and embase our hypothesis that girls will have a better language performance than boys and the last ones will suffer the effects of mother depression more than girls.

METHODS

Subjects

Eighty mothers and 3-year-old children were analyzed. They were participating in the project that follows dyads from pregnancy onwards, through the public healthcare system, in a district of Sao Paulo. Of the participating children, 31 were males and 49 were females, with ages ranging from 3 years to 3 years and 5 months without any risk factors for the development. As far as their mothers are concerned, 30 displayed PPD features, as per the Edinburgh Postnatal Depression Scale[21] applied when the child was 3 months old. Out of those, twelve had male children and eighteen had female children.

Material

The child's language skills were assessed through a pragmatics language assessment, using the Test of Child Language Evaluation called ABFW[22], which evaluate four aspects of child language: phonology, vocabulary, pragmatics and fluency, in accordance with a specific protocol. For the pragmatics, an open and playful activity between mother and child is proposed. This activity is videotaped and takes place at a specific site in Psychology Institute of a higher education institution. The following toys are used: wooden dollhouse, cloth dolls, and furniture and household items (bed, table, chairs, lamps, etc.). All responses provided by participants were transcribed onto the specifics protocols.

The research also used dates from questionnaires referring to all its phases: the last gestational trimester, birth, tenth and twelfth weeks of the baby's life, fourth and eighth months of the baby's life, first, second and third year of the child's life. In these, we were able to obtain all the identifying data for the newborn's mother and father, family constellations, and maternal history. Additionally, questions were asked regarding the interaction between them since birth, during the hospital stay, daily routines, as well as the mother's expectations toward the child. For this study, we considered informations about social support (husband, family), mother´s occupation and child´s enrollment in daycare centers.

Mothers participating in the project were divided based on whether or not they displayed symptoms of postpartum depression, according to the Edinburgh Postnatal Depression Scale (EPDS)[21]. This scale was validated in Brazil and has been used to assess post-partum depression in mothers from the postnatal

period on. It consists of 10 "self-report statements" (e.g., I have been able to laugh and see the funny side of things; I have felt sad or miserable, among others), which are measured through a scale from 0 to 3 points (e.g., 0 as much as I always did; 1 most of the time). Mothers could score between 0 to 30. The sum of scores allows us to track those mothers who score below or above the chosen lower and upper limits (11/30), consequently, all mothers scoring below (less than 11) are assessed as potentially non-depressed, and those scoring above it as potentially depressed. This is the reason why we use the term "mothers whom posses PDD indicators or not".

Procedures

This research was approved by the Hospital´s IRB board of the *Universidade de São Paulo* (USP) (CEP 673/06), and the Human Subjects Committee, observing all the ethical principals of article 6º in the Code of Ethics, with emphasis given to the Terms of Informed Consent, which explains the stages of the project and guarantees absolute confidentiality of information, as well as the right to withdraw from the study at any moment.

The present research assessed the pragmatic aspects of children's language, based on the videos of the open, playful interaction between mother and child (15 minutes). All responses provided by participants were transcribed onto the protocols, together with behaviors and facts observed by the person doing the assessment.

Pragmatics was analyzed based on the total of communicative acts (mother and child), communicative acts carried out by the subject, percentage of acts and communicative acts per minute. Communicative means used, as well as the communicative functions were also utilized.

- Communicative acts: start when the adult-child or child-object interaction begins, ending when the focus of the child's attention changes, or when there is a change in turn.
- Communicative means: communicative acts are divided in three types: verbal (VE) - those involving at least 75% of language phonemes, vocal (VO) - all other utterances and gestural (G) - involving body or facial movements
- Communicative functions: classified as object request, permission request, action request, social routine request, information request, calling, performative, exclamative, reactive, non-focused, protest, play, acknowledgment of the other, exploratory, showing off, narrative, comment, protest, self-regulatory, and joint play[22].

According to the author of the test, at this age, we expect 6 to 8 communicative acts per minute[22].

Data analysis

The results of each test were analyzed separately in order to have a sample´s profile and their association with the resulting data of the participant's medical history was verified.

For this we utilized descriptive percentages and statistical tests, such as: Chi-square contingency (for the last two categorical variables), means tests to assess the difference between more than two groups in function of one or more continuous dependent variables (ANOVA), and multivariate techniques (the data described above are about variables that are considered correlated), such as principal component analysis, cluster, and correspondence analysis.

RESULTS

According to our data analysis, girls performed better in the pragmatics test, in which 58% of the non-PPD group and 44.4% of the PPD group were within the expected range for their age group, according to communicative acts per minute[22]. Boys, however, had a poorer performance than the other gender, with 33.3% of the PPD group and 42.1% of the non-PPD group performing as expected for their age group.

Interaction between pragmatical skills, PPD and gender

As far as the mother-child interaction is concerned, different results to the ones previously described were found. It was observed, however, that in both the PPD group and the non-PPD group, girls interacted more with their mothers (TCA average for the non-PPD group: 192 and for the PPD group: 180) and talked more during the interaction period (CAC for the non-PPD group: 94.4 and for the PPD group: 91.3). Therefore, they occupied a wider communicative space than boys (communicative space percentage: 49% for the PPD group and 50.2% for the other; communicative acts per minute of girls with PPD: 5.8 and without PPD: 6.2). Analysis of variance (ANOVA) showed that there was no effect of sex and PPD in child performance, considering 5% of significance (Table 1).

Concerning to communicative means, it was observed the effect of gender in children´s performance. Girls used verbal means much more often than boys ($F=7.8$; $p<0.006$; λ de Wilks: 0.635), who, in turn, favored vocal ($F=10.8$; $p<0.002$; λ de Wilks: 0.635) and gestural means ($F=12.1$; $p<0.001$; λ de Wilks: 0.635). Girls, again, utilized the verbal means proportionally more often ($t(80)=0.000$; $p<0.005$) than boys who, in turn, utilized proportionally more gestures ($t(80)=0.003$; $p<0.005$) and vocalizations ($t(80)=0.000$; $p<0.005$).

Communicative functions were also analyzed and a similarity was noted between the groups; in other words, all groups, regardless of gender and PPD status, utilized similar communicative functions, such as: comment, information request and calling. There was significant difference only in the performative function in the non-PPD group, which carried out more performances in the surroundings than girls did ($F=4.0$; $p<0.008$; λ de Wilks: 0.858). It was observed, in the data described above, that girls commented more and requested more information than boys,

Table 1. Average performance of boys and girls in relation to postpartum depression

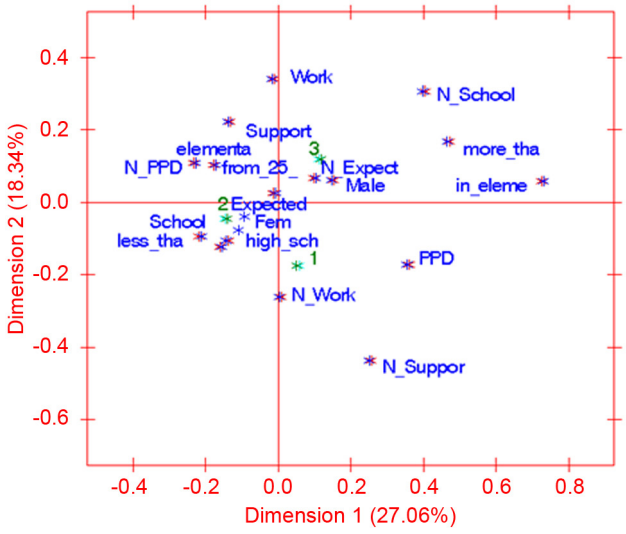
	Male				Female			
	PPD	SD	Non-PPD	SD	PPD	SD	Non-PPD	SD
CAC	79,7	24.8	86.8	33.5	94.4	26.6	91.3	28.6
TCA	156,6	51.4	178.7	65.4	192.3	57.3	180.4	51.3
% CS	51,8	6.1	48.3	6.8	49.2	3.6	50.2	4.7
Expected	5,2	No	5.6	No	6.2	Yes	5.8	No
Vocal	6,3	5.4	6.3	4.1	3.9	2.8	2.5	3.8
Verbal	65,6	22.7	6.,6	25.8	83.7	26.3	83.9	26.8
Gesture	17,8	12.2	13.2	10.6	10.6	7.1	6.1	7.2

Note: PPD = postpartum depression; SD = standart deviation; CAC = communicative acts by children; TCA = total of communicative acts (mother and child); % CS = percentage of communicative space by children

using verbal means to inform the mother, which is expected for their age group. Boys did the same, but less often.

When compared to the gender and PPD variables of mothers´s data (if child goes to school, mother´s work and social support), it couldn´t be found influences of these in boys and girls´s performance.In order to depth analysis, all variables of this study were grouped into clusters through correspondence analysis. The sample was divided into three groups according to the level of test performance: cluster 1 - children with the best performance in all functions and means considered; cluster 2 - children with good performance on functions with one exception in gestural and performative and cluster 3 - Children with low performance. A summary of the previously described analyses was observed, as per the Figure 1.

The variables which were most related to cluster 3 are not expected for age group, and male. For cluster 2, on the other hand, the most related variables are: expected, female, under 25 years of age, in daycare, mother's education = at least high school. Cluster 1 is the least related to the variables at hand (age, PPD, sex, etc.), and its closest proximity is with mother does not work outside the home.



Note: N_School = children didn't go to school; elemsch = mothers studied until elementary school; N_PPD = mothers didn't have PPD symthoms; 25 to30 = mother's age; N_Expected = child's performance was not expected for the age; more_30 = mother with more than 30 years old; in_elems = mothers graduated in elementary school; less_25 = mother with less than 25 years old; highscho = mothers graduated in high school; PPD = mothers with postpartum depression; N_work = mothers didn't work; N_suppor = mothers didn't have any support

Figure 1. Influence of each study variable in relation to the clusters

DISCUSSION

The data above reveal the importance of interaction, principally with the mother, to child language development. Children who talked and interacted more were those whose mothers were the primary caregiver and primary source of stimulus for the child.

The present research confirmed differences between boys and girls in almost all studied aspects. This difference can be noticed as early as the transcription of videotapes. Mother-daughter play was more syntonic than mother-son play; in other words: when playing with their daughters mothers participated, shared ideas and reinforced behaviors, while mothers did not always play together with boys (the child would focus his attention on one toy and the mother on another), the mother would call attention to her own activity and, often times, would not reinforce the activities and behaviors proposed by their sons.

As far as the pragmatics test is concerned, girls spoke more, interacted more with their mothers and used (verbal) speech with the intention of transmitting and apprehending information during communication, which is expected for their age group. Boys seem to make more use of communication, in all its means, in order to explore their surroundings (carrying out performances with toys, calling objects) and to focus their mother's attention to their speech and play rather than to transmit information, as is the tendency with the opposite sex. These data agree with other researches[20,21] in which girls were more encouraged to talk and participate in the turns during the interaction than boys, who had a shorter attention span during open playtime. Boys and girls elicited different interaction styles from their mothers not only due to their gender, but also as a factor of the relationship they establish with their mothers.

It is noteworthy that there was a difference across genders in terms of presence of depressive symptoms. Boys who performed the best were those whose mothers did not display depressive symptoms, had no help with childcare, and did not work outside the home, while girls did best when their mothers did have PPD, had help with childcare, and did not work outside the home. Neither of them was in daycare. The influence of gender in the performance of children and the dyadic interaction can be observed; boys stay with their mothers only, who therefore become their primary caregiver and stimulator of their son's communicative-linguistic development. These did not display depressive symptoms, which are considered a risk factor for the mother-child interaction[23-26]. In the case of girls, even when their mothers had depressive symptoms, other people were available to stimulate the child, since these mothers had childcare help. Besides, even when they were less available to interact with their daughters, these participated more in dialogues and activities, engaging the mother during interaction more than boys did. Another hypothesis would be the child's gender significantly influences the mother's depressive symptoms and quality of life, with boys being more associated with stressors and depressive symptoms than girls, thus hindering the mother-son relationship[20].

Therefore, an agreement can be observed between the data described and the literature findings in terms of gender differences in the communicative-linguistic development of children, and the mother's influence on this process. Because they talk more, girls are encouraged by their mothers to keep turns in dialogue, differently from boys, who display a shorter attention span during playtime and interaction.

The results described above allowed us to highlight the importance of the mother-child interaction to the communicative--linguistic development of children, as well as the differential performance between boys and girls. This difference is due not only to developmental issues, but also to the quality of the mother-child interaction and the influence of socio-affective aspects, such as PPD. The child's exposure to inadequate interaction styles presents different risks to his/her affective and cognitive development, which may have distinct consequences for boys and girls.

Therefore, this study attempted to determine the influence of gender and PPD-related factors on the language development of three-year-old children. The analysis of these effects within a wider context encompassing family composition and social support allowed for a deeper understanding of how upbringing-related socio-affective variables and child characteristics effectively influence the interactional process and the development of children.

CONCLUSION

Cluster analysis did not show effect of PPD on the language development, however, it showed the relevance of the characteristics linked to the availability of the mother and gender of the child. The descriptive analyses and direct comparison of the means showed general effects of PPD and specific effects according to the child´s gender. Boys seem to be more dependent on the mother for the stimulus of the language and sensitive to the depressive symptoms. They had better performance when the mothers were the main caregivers and did not present PPD. Girls, whose mothers had postpartum depression, obtained the best performances in the presence of PPD as they encouraged their mothers to participate of the dialogues and activities, even with lower emotional availability, and presented other sources of stimulus.

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