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## Interpreting of Children's Emotions by Mothers Living in St. Petersburg (RF)

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### Abstract

The article is devoted to recognition of child's emotions in Russian mother sample. 80 mothers living in Saint-Petersburg took part in research. For studying of recognition of facial emotions of children the «IFEEL Pictures» method was used. The results of this research lead us to the following conclusions: the words used by Russian mothers in order to classify emotions displayed in photographs of children's faces can be grouped together in categories according to their semantics and according to their placement on the scales of arousal and hedonic tone; the lexicon of emotional words, used by Russian mothers to describe emotions displayed in photographs of children's faces differ from those employed by American mothers in terms of the content and significance of emotional categories and their placement on the scales of arousal and tone; level of arousal for positive and negative emotional categories depends on mother's education and family income.

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*Keywords:* interpreting children's emotions, mothers, emotional categories, emotional tone, emotional arousal.

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### 1. Introduction

Adequate recognition of child's emotions provides responsiveness and emotional availability, affective adjustment of his/her primary social-emotional environment. The way a mother recognizes child's emotions and responds to them influences the child's awareness and plays an important role in development of his ability for

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self-regulation. The IFEEL Pictures method [1] allows revealing specific features of recognition of emotions by mothers from different cultures. The results of studies show that characteristics of mothers' recognition of children's emotions in photos are connected with belonging of mother to a certain group of risk, and allows predicting patterns of mother-child interaction and distortion in mothering. Besides there are data that factors of an "age", "educational level" and "level of the income" can influence characteristics of recognition of children's emotions in photos [1], and mothers differ in quality and quantity of emotions used during interacting with children of different genders [2], [3].

Until recently there has been no research done on recognition of child's emotions by mothers living in the Russian society. Accordingly, there were no data on lexicon and specificity on it's categories, no information about possible changes of the recognition in connection with the family socio-economic characteristics. This study represents the lexicon and it's categories in the group of St. Petersburg (Russian Federation) mothers in connection with their educational level and family income.

## 2. Method

### 2.1 Participants

80 mothers took part in research. All they were Caucasian, inhabitants of St.-Petersburg (Russian Federation), Russian speaking and had healthy children aged between 11 and 24 months ( $14.3 \pm 2.9$  months). Mothers' ages ranged from 22 to 35 years ( $27.6 \pm 3.5$  years). All the mothers were either married or lived with a partner. The mothers' level of income varied from medium to high (average-low level of the income is 21.7%; average level of the income is 73.3% and high level of the income is 5%), an educational level of mothers varied from post-high-school training to a university degree (specialized secondary education is 20%; not finished higher education is 16.7% and higher education is 63.3%).

The research was provided in the child outpatient clinic at one of St. Petersburg city hospital for children.

### 2.2 Instruments

1. The questionnaire offered to mothers, contains questions concerning their age, marital status, educational level, a level of family income and age and gender of the child.
2. For studying of recognition of facial emotions of children the «IFEEL Pictures» method was used [1]. The method consists of a standardized set of 30 pictures of one-year-old infants which have been developed to present few pictures displaying clear and distinct facial expressions of emotion and most pictures portraying rather more ambiguous expressions of emotion.

### 2.3 Procedure

The mothers were asked to look at the 30 infant photographs in a standardized order, and they were asked to write in the form of answers the clearest and the most precise emotion, which they thought the infant showed. After that the mothers were asked to put a point which corresponds to an emotional condition of the child on a two-dimensional coordinate space. Values of X-line mean the level of hedonic tone; values of Y-line mean the level of arousal. Both scales include points from 1 to 9. If the woman experienced greater difficulties in verbal definition of the emotion expressed in a photo, she was offered the list of emotions for help.

The women's responses are categorized according to the lexicon and the following methods of statistical analysis were employed;

- The Category method involves categorization of the mothers' verbal responses.
- The Space method is used to investigate the distribution of emotional categories in the participants' answers according to their co-ordinates of arousal and hedonic tone. This was carried out on the

participants' responses to each of the 30 photographs. This system of analysis is linked to the point of view that positive and negative emotions are organized independently on the two-dimensional scale [4]. This method may help to identify the participants (groups of participants) who identify the emotion of the child in the photograph as positive or negative as expected, but who display this on the axes in an idiosyncratic or unusual manner. For example attributing a particularly low level of arousal for both positive and negative emotions.

### 3. Results

The results of the investigation are given in the following order: First – definition of emotional category the frequency of occurrence of different emotional categories, then the tone and the arousal for each emotional category, then correlations between the tone and the arousal for some emotional categories, followed by the interrelationship between the socio-demographic category of the mother and the frequency of use of tone and arousal for groups of positive and negative emotional categories.

#### 3.1 Emotional Categories.

When using the IFEEL Pictures method with Russian mothers, problems were encountered with regard to the emotional lexicon, which is to say those words employed by women to categorize the emotions depicted in the photographs. In the study of USA sample of mothers, words were grouped together in a thesaurus according to their categories and given code numbers [1]. The categories are as follows (1) Surprise, (2) Interest, (3) Joy, (4) Content, (5) Passivity (estrangement), (6) Sadness, (7) Shyness, (8) Shame and Guilt (9), Disgust (10) Anger, (11) Distress, (12) Fear. Other answers, such as 'hungry', 'in a bad mood' or 'lovely' were put in the 'others' category. As this method of processing results is culturally dependent, due to different conceptions of emotion in different cultures, a direct use of the USA thesaurus from the study of English-speaking mothers proved impossible for Russian-speaking sample of mothers.

In order to define the emotional categories in the Russian-language thesaurus a Hierarchical Cluster Analysis using the Between Groups Linkages method was performed, on the basis of the indications of tone and arousal attributed by the mothers to different emotions. In result, the emotions were divided into sixteen categories: A-Surprise; B-Interest; C-Joy; D-Satisfaction; O-Pensiveness; E-Indifference; F-Sadness; G-Shyness; H-Guilt; I-Disgust; J-Anger; K-Distress; L-Fear; P-Offence; S-Concern; T-Dissatisfaction.

In order to define the categories, which had been differentiated by the cluster analysis, an expert evaluation of emotional terms was undertaken. The clusters were then labeled, using contemporary Russian dictionaries of word definitions and word construction. Emotional terms which together accounted for less than five percent of their categories, which had not been included in the cluster analysis, were also put into categories by means of expert evaluation.

It is important to note that besides terms that directly describe emotions or emotional states, several emotional categories included words describing external actions and influences as well as words designating action which accompanies a given emotional state. Many authors have noted that it is possible and necessary to incorporate such words into the emotional categories [5], [1], [6]. Such words do not represent more than 10% of responses in any one emotional category, and so it can be reckoned that the mothers, when faced with the task of describing the emotions of children, used words that specifically designate emotions and emotional states. It follows, therefore, that they have a sufficiently wide emotional vocabulary of emotions for the task. This result is important in developing an understanding of emotional interaction between mother and child since the fact that the mother describes the infant's state in emotional terms shows that she recognizes and understands that the state is essentially an emotional one and can therefore react to it, which contributes to the emotional wellbeing of the child.

16 emotional categories were determined as a result of clustering (A- Surprise; B-Interest; C-Joy; D-Satisfaction; O-Pensiveness; E-Indifference; G-Shyness; S-Concern; F-Sadness; H-Guilt; I-Disgust; J-Anger; K-Distress; L-Fear; P-offence; T-Dissatisfaction; M- Other)

The most frequently repeated emotional categories were interest (21.1 %), surprise (13.6 %) and offence (11.5 %). The category of average frequency of occurrence (from 4 up to 10 % by authors of a technique classification) included pensiveness (9.6%), joy (7.9%), fear (6.7%), concern (5.3%), sadness (5.6%) and dissatisfaction (4.9%). The most rarely named categories were satisfaction (3.7%), distress (3.6%), anger (2.3%), passive (1.2%), guilt (0.4%), disgust (0.3%) and shyness (0.3%). From a total of 1800 responses, 34 (1.9%) fell into the “Other” category.

### 3.2 Hedonic tone and arousal of emotional categories

The mean level of hedonic tone and arousal for designed emotional categories are following: A – Surprise (M±SD for tone 5.9±1.9; for arousal - 6.0±2.2); B-Interest (M±SD for tone 6.4±1.5; for arousal - 5.2±2.0); C- Joy (M±SD for tone 7.6±1.0; for arousal - 5.9±1.8); D-Satisfaction (M±SD for tone 7.4±1.2; for arousal - 4.5±2.6); O-Pensiveness (M±SD for tone 6.5±1.5; for arousal - 4.0±2.1); G-Shyness (M±SD for tone 5.5±2.2; for arousal - 5.8±1.7); E-Indifference (M±SD for tone 4.6±1.0; for arousal - 3.5±1.6); S-Concern (M±SD for tone 4.00±1.18; for arousal - 5.06±1.82); F-Sadness (M±SD for tone 3.50±1.5; for arousal - 3.80±1.9); H-Guilt (M±SD for tone 3.71±2.14; for arousal - 4.57±2.64); I-Disgust (M±SD for tone 2.83±1.17; for arousal - 6.17±1.17); J-Anger (M±SD for tone 2.68±1.23; for arousal - 6.90±1.70); K-Distress (M±SD for tone 1.65±0.91; for arousal - 7.92±1.68); L-Fear (M±SD for tone 3.03±1.22; for arousal - 5.96±1.95); P-offence (M±SD for tone 2.47±1.18; for arousal - 5.53±2.21); T-Dissatisfaction (M±SD for tone 2.64±1.23; for arousal - 6.36±2.16).

The results of the analysis of the correlation between hedonic tone and arousal show a strong positive correlation where the indicators of tone and arousal are high for the categories *Surprise* ( $p < 0.001$ ) and *Interest* ( $p < 0.000$ ). In other words, when mothers recognize emotions on the faces of infants in the photographs as belonging in the *Surprise* and *Interest* categories, an increase in the level of arousal is accompanied by an increase in the hedonic tone and vice versa. In contrast, when negative emotions are recognized, an increase in the level of agitation is observed as the hedonic tone decreases towards the most negative values. For the negative emotional categories, the inverse (negative) correlation between the levels of hedonic tone and arousal was revealed in the cases of *Anger* ( $p < 0.001$ ) *Fear* ( $p < 0.001$ ) *Distress* ( $p = 0.004$ ) *Dissatisfaction* ( $p = 0.000$ ) and *Offence* ( $p = 0.000$ )

### 3.3 Characteristics of recognition of emotions in association with the level of mother's education and family income

Firstly we investigated the influence of the above factors upon the total frequency of positive and negative emotional categories, according to the age of the mother. This was achieved by means of Analysis of covariate (ANCOVA) with the following independent variables factors: «level of education», «sex of the child» and «income» and with «age of the mother» as the covariate. The results showed that these factors, both when considered individually and in combination, do not have a significant effect upon the overall total of positive or negative emotional categories identified by mothers.

Secondly, we conducted a two-dimensional Analysis of covariate of indicators of tone and arousal, within positive and negative emotional categories. The factors were: «level of education», «sex of the child» and «income» and the covariant was the age of the mother.

### 3.4 The Arousal level and Intensity of the hedonic tone for the group of positive and the group of negative emotional categories.

The mean value analysis show that the level of arousal for positive categories increases from specialized secondary education to not finished higher education (from 4.8±0.2 to 5.5±0.2;  $p = 0.031$ ), and does not change

significantly from not finished higher education to higher education ( $5.2 \pm 0.15$ ). The level of arousal for negative emotional categories does not change significantly from specialized secondary education ( $5.39 \pm 0.27$ ) to not finished higher education ( $5.44 \pm 0.28$ ), but increases from not finished higher education to higher education (from  $5.44 \pm 0.28$  to  $6.03 \pm 0.17$ ;  $p = 0.001$ ).

The family income influences the index of arousal for positive emotional categories as follows. The level of attributed arousal decreases from average-low levels of income ( $5.85 \pm 0.23$ ) to average ( $5.02 \pm 0.14$ ) ( $p = 0.001$ ) and decreases further towards the highest income levels ( $4.47 \pm 0.34$ ) ( $p = 0.004$ ). The index of arousal for negative emotional categories increases from average-low income levels ( $5.09 \pm 0.25$ ) to average ( $5.92 \pm 0.19$ ) ( $p = 0.011$ ) and shows no change between average and high ( $6.08 \pm 0.38$ ) incomes. In other words, as the level of income of the mothers is increased, her judgment on the intensity of emotions decreases for emotions belonging to positive categories, and increases for those belonging to negative categories.

As such, it is observed that, of the factors we have laid out previously, «level of education» and «level of income» for positive categories ( $F_{(2,1003)} = 7,861$ ,  $p < 0,001$ ) for negative categories ( $F_{(2,759)} = 3,304$ ,  $p = 0,037$ ) have an effect upon the index of arousal. However, these factors do not have any effect upon a given mother's judgment of tone. An increase in the age of the mother leads to a decrease in the indication of arousal for positive emotional categories. The sex of the child does not have an influence upon the characteristics of recognition of facial displays of emotion.

#### 4. Discussion

Upon investigation of the frequency of occurrence of different emotional categories, it became clear that the mothers most often employed the *Surprise*, *Interest* and *Offence* categories. Both international [1], [7], and Russian researches [8] show that the most important aspect of interaction between mother and infant from age 12 to 24 months is the cooperative exploration of the environment. It can be suggested therefore, that the frequency with which mothers of 12 to 24 month old infants attribute emotions to these categories, testifies as to the importance of such emotions in the interaction of children of this age group.

The categories representing *Guilt*, *Shyness* and *Disgust* were not frequently encountered among our selection of mothers (less than 1% of the total responses) and thus can be considered to occur only in exceptional cases. The infrequency with which emotions are classified in these categories is attributable to the fact that guilt and shyness are only developed towards the end of early childhood/infancy [9]. While it is possible for disgust to manifest itself during infancy [4], it is used socially only as the child develops. As the majority of the photographs used portray children displaying complex emotions, we can suggest that in the majority of cases the responses would reflect the women's own experience [10]. On the basis of the experimental results and data from literature, we can postulate that when mothers describe facial expressions in photographs, they will recognize those emotional categories which feature most heavily in their interactions with their own children.

Our results show that for a facial expression which is identically categorized by mothers in terms of emotional category, the distribution of level of arousal will be characteristic whilst that of the level of hedonic tone will not. This data about the distribution could be taken as evidence that children have differing emotional experiences, independent of the fact that their mothers categorize their facial expressions identically. In other words, the difference in infants' emotional experiences can be linked both to the different emotional categories used by mothers when evaluating their facial expressions and to difference of interpretation of level of arousal within an emotional category.

We have demonstrated the impact of social factors upon the characteristics of emotional recognition. Not only when recognizing emotions in photographs, but also, it is likely, when interacting with children, women act under the influence of various conditions in their life, which bear influence upon their choice of emotion, level of arousal and hedonic tone, which they ascribe to a given facial expression. A child who interacts with his or her mother comes face to face with all the circumstances through which the mother is living. The type, level of arousal and hedonic tone ascribed to an emotional display depends upon the woman's current situation. A change in the level of income in the family (for example with paternal support) has a significant influence upon the level

of arousal and intensity of tone which a woman attributes to her child's emotional displays which is to say it influences the child's understanding of their own emotions and situation. Therefore, it is the case that a child's emotional development and understanding of their own situation through his or her mother (caregiver) depend, to a large degree, upon the social conditions of the mother's life. As such, it is essential to understand a child's social environment as being much wider than just the mother (primary caregiver) with his or her focus on the child and situational behaviour in the process of interaction. This environment is in fact a much wider sphere, which encompasses the level of education that the mother has had up until the birth of the child; the presence or absence of a father in the family; the stability of the relationship between father and mother; the level of income of the family and so on.

The results of this research lead us to the following **conclusions**:

1. The words used by Russian mothers in order to classify emotions displayed in photographs of children's faces can be grouped together in categories according to their semantics and according to their placement on the scales of arousal and hedonic tone.
2. The lexicon of emotional words, used by Russian mothers to describe emotions displayed in photographs of children's faces differ from those employed by American mothers in terms of the content and significance of emotional categories and their placement on the scales of arousal and tone.
3. Level of arousal for positive and negative emotional categories depends on mother's education and family income.

### 5. The further directions of research

The subsequent researches can be devoted to studying the influence of characteristics of recognition of children's emotions by women on quality of their interaction with children and on development of the child. Revealing interrelations between characteristics of recognition of children's emotions and psychological features of mothers will be interesting. Studying of change of characteristics of recognition of children's emotions in connection with realization of programs of early intervention, and also change of these characteristics of employees in orphanages after change of a social environment in orphanage might be important.

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