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Cristiano Alberto Muniz

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Mathematical learning difficulties: a subjective production

Amanda Marina Andrade Medeiros¹
University of Brasília

Cristiano Alberto Muniz
University of Brasília

Abstract: It is necessary to expand the analysis about affective processes in mathematic learning in different contexts. In Brazil this research area is still in the embryonic phase, but it is a space that has strong potential to respond the gaps that still exist in the field, leading to the understanding affective processes in mathematic learning. It is in this way that the present research aims to analyze how the mathematic learning difficulty is produced in the subjectivity of a child from the elementary school in Brazil. To understand how the student's development occurs in the school space, and how the difficulty is build, we took as a theoretical basis the Theory of Subjectivity by Fernando González Rey. The case study was a resource used in the constructive-interpretative process. The research was carried out in a public school in the Distrito Federal, Brazil. The mathematic learn difficulty, in this work, was produced by the research participant in different contexts, including, family, school and friendships. Several experiences and influences of the person generate subjective senses that will emerge in subjective configurations in often school activities, regardless if these subjective senses were produced in school or outside it.

Keywords: Mathematic learning difficulty, affectivity, subjectivity, self-confidence.

Introduction

The studies in Mathematics Education field, in Brazil, advanced a lot in the recent decades, with increasing investigative production in the area, especially qualitative research (Borba, M., 2004; Borba, R., 2017; Crecci, Nacarato & Fiorentini, 2017). Despite of several advances, mostly researches, even those in a qualitative perspective, is a space for data description, without theoretical reflection and new knowledge construction (Medeiros, 2016). Moreover, the emphasis on didactics, methodologies, cognitive aspects and teacher training are mostly than those related with the subjectivity, including emotional and motivational aspects.

However, in addition to the didactic-methodological aspects and cognitive development, it is necessary researches that analyze mathematic learning difficulties in a systemic way, observing the complexity of the phenomenon (Morin, 2011), also highlighting affective aspects in human development. In the end of the 1980s the studies that considered affectivity in the mathematic learning

¹ amandamedeiros@unb.br

process began to increase. The professor Douglas McLeod (1999) was one of those who influenced researchers around the world with his studies about affectivity and mathematic learning.

Hannula et. al (2016) presented a study about recent researches that there were affectivity and mathematic education with the focus, including beliefs, attitudes, motivation and emotions in the process of teaching and learning mathematic. The study showed that there are a great number of questions that still needs to be answered, regarding the relationships between cognitive and affective aspects in the mathematic learning field, including those referring to the social environment in which the student is inserted. Gómez-Chacón (2000) points out that the context in which the students are inserted, the social space in which they lives, influence their beliefs about mathematic learning, as well as their view about being capable or not to do mathematic.

Dede (2009) also highlighted the importance about use different teach instruments and student notes habits, which allowed the self-confidence increase, as well as the students motivation, overcoming the learning difficulties that they had previously.

For Muniz (2015), every child is a mathematical being, who produces knowledge. It is in the child's action with the knowledge object, that he/she learns comprehensively, produces knowledge. To know mathematic and know how to do mathematic is not a gift, but a child production, developed in the interaction with the spaces in which he/she lives. The mathematical being is active in his/her learning process, so the mathematical being is a subject who learns mathematics (Muniz, 2015). However, the relational experiences that the student has in his/her community and in the school space, can create barriers to mathematic learning, as Gómez-Chacón (2000) has already demonstrated, causing an image of himself/herself that does not agree with a mathematic knowledge producer, being directly related to self-esteem, self-confidence and self-image, psychological resources that developed in his/her life course are essential in the process of mathematic learning.

Hannula et. al. (2016) highlights that it is necessary to expand the analysis about affective processes in mathematic learning in different contexts. In Brazil this research area is still in the embryonic phase, but it is a space that has strong potential to respond the gaps that still exist in the field, leading to the understanding affective processes in mathematic learning.

It is in this way that the present research aims to analyze how the mathematic learning difficulty is produced in the subjectivity of a child from the elementary school in Brazil. We highlight that the research information comes from the doctoral thesis of the first author.

Theoretical framework

The children school mathematic learning process involve the experiences that they live and lived, as well as their own reflections, established in the interrelation process, which constitute their subjectivity. It is important to highlight that the subjectivity is not built by only emotional or only cognitive factors, but by symbolic-emotional units, formed into a sociocultural context, in which the cognitive is presented as a subjective production. In this way, we cannot unlink emotions and the learning process. Each with their experiences, beliefs and conceptions, have emotions manifested in the mathematic activities. Many theorists, such as Vygotsky (1997), González Rey (2017), Castoriadis (1982) and Morin (2011), discussed, in their studies, that in an action a person works with emotional and cognitive aspects simultaneously. This is also the case in the process of mathematic learning.

Gómez Chacón (2003, p. 142) showed in her study that,

In the case of students with school failure, in which the history of the affective dimension of the subjects is unfavorable, anxiety, fear and low self-confidence generate processes of denial and avoidance that usually occur at the same time of activity presentation that the student must to do. The negative affect and cognitive feedback, produced by strategies and "avoidance" heuristics form a stable structure that prevents a satisfactory resolution of the problem.

The author showed, from her study, some evidences about the behavior of students when they had negative affects about mathematical knowledge, situation in which many students avoided the activity, or presented processes of frustration, anxiety and fear, for example. These affections varied, depending of the context or activity presented. The study brought important information about the relevance of affections in the mathematic learning process, and it is in this context that school mathematic learning difficulties may arise.

Therefore, we consider that the child learns mathematic producing a single subjectivity, without separation between intellect and emotion, because "the subjective senses developed in the

process learning are inseparable from the complexity of the subject's subjectivity"(González Rey, 2006, p. 34).

The school system, with regard to teaching and learning mathematic, often attributes the students difficulties in mathematical knowledge to the cognitive aspects, to the mathematical knowledge, to the inappropriate methodologies (Medeiros, 2016), and doesn't account in this analysis, of the children mathematics learning difficulties, the emotions that these establish with mathematical knowledge.

The school learning happens, usually, by means the transmission or construction of scientific knowledge (Vygotsky, 1997), despite of the school being a learning space, what sometimes happens in this space is non-learning, this non-learning is often effective in learning difficulties, when the student cannot overcome the obstacles necessary for learning a knowledge in time and space determined by the school system.

According to González Rey (2011,p. 35) "we only notice, reflect and memorize those aspects that gain subjective sense in the subjective configuration that emerges in the course of the lived experience that represents the living moment of personality in the subject's action". The person doesn't have control about the subjective configurations² produced at the moment of learning, because these are defined according to the systemic arrangement that involves lived experiences and the context of the current action or experience. A person is every time confronting ideas, conceptions, concepts, beliefs and emotions, originating from different experiences, lived throughout his/her life trajectory, considering the dynamic relationships between subjective senses produced by him/her and social subjectivity ³. Thus, we analyzed the process of mathematical learning of the child in a systemic way, observing that different subjective configurations are formed all the time. The person lives a continuous movement in his/her subjectivity, which involves symbolic-emotional aspects.

² For González Rey (2005a) subjective configuration constitutes a dynamic organization that is formed from diverse subjective senses, arising from different experiences, socials and individuals.

³ According González Rey (2005b) social subjectivity "represents the subjective organization of the various social spaces, which form a system configured by the multiplicity of productions that, in a certain society, is part of the different and partial social spaces coexisting in it" (p.147).

Subjectivity is the complex form in which the human psyche takes place in the development of people and every human processes. Different of subjectivism, subjectivity allows us to a conception of mind that is inseparable of the history, culture and current contexts of human social life. Subjectivity emerges when the emotion becomes sensitive to symbolic records, allowing to the human production in the world in which his/her lives, and not simply adaptation to it (González Rey; Patiño Torres, 2017, p. 123)

In this perspective, the context is a factor of extreme relevance in the analysis of the phenomenon. The culture, beliefs and values experienced by the student will be present in the mathematic doing, moment that different social subjectivities emerge by means the individual subjectivity of the child who is in the process of mathematic learning.

We will analyze how the difficulties are built in the process of developing of the mathematics doing. That is why is relevant to defining what is mathematic school learning difficulties.

Difficulties to learning or learning difficulties?

It is essential for life to have difficulties, including to learn. The challenges proposed in the mathematic tasks are obstacles to be overcome, becoming needs for student action, including to learn it. A child may have difficulty solving a puzzle, for example, but the challenge to overcoming obstacles and reaching the problem resolution makes the difficulty a force to the action. Thus, there is a cognitive unbalance for the re-elaboration the strategies to solve problems, eliminating the difficulty, occurring learning, change and strategies creation.

Therefore, difficulty is necessary to learning, however, as Brousseau (1989) pointed out, this difficulty, or obstacle, cannot become a learning paralyzing to the child, however it is often a difficulty to become a barrier to learning.

The child, doing mathematic tasks, when encountering a new situation, uses the repertoire of knowledge, concepts and schemes already developed previously, so we highlight the importance of the child being accompanied by the educator, because he/she will propose situations that promote the production of new schemes for the obstacles overcome. The educator should to observe and to evaluate the child in the learning process, aiming that the obstacles necessary for learning do not become permanent and insurmountable obstacles, stopping new learning.

To overcome the obstacles is an essential part of the learning process. Overcoming obstacles involves the realization of new learning. As Bachelard (2006) points out, obstacles always exist, because the formation of a new concept finds in the concepts previously constructed the first obstacles. Constructing a concept, implies reviewing, denying, expanding, reconstructing concepts that were consolidated in the cognitive history of each child who learns.

Therefore, obstacles are important in the learning process, but these are, sometimes, insurmountable for some students, generating mathematic learning difficulties. However, the mathematic learning process depends not only of the operational factors from the psychological, of the teaching methodologies or of the epistemological aspects about the knowledge, but of a system (Morin, 2011), that involves cultural aspects of the context in which the child lives and symbolic-emotional aspects, that the school should consider in the process of teaching and in the process of evaluate the difficulties (GonzálezRey, 2006).

The resolution of a problem-situation can be seen by a person as a challenge, the problem is that the children are different, with different subjectivities, so the difficulty generated by the challenge can be a paralysing of action and learning, especially when dealing the learning in the school environment. Mathematic learning can be happen in different contexts, but it is the mathematics school learning that usually leads the child to feelings like impotence, stress, discouragement, low self-confidence and frustration (Dal Vesco, 2002; Gómez Chacón, 2003; Medeiros, 2009; 2012), emotions often present during the mathematic tasks resolution by the child and that can cause learning difficulties, because will contribute to the child not overcome the obstacles necessities to the learning.

These emotions appear in the school space because the classroom is not just a space for learning sciences, but also of collections, values, cultural differences, disproving looks. In addition, the child who socializes in this space has a history, that allowed experiences that enabled the production of subjective senses that will emerge in this classroom by means subjective configurations and that guide the mathematic doing, as well as the desires, dreams, frustrations and hopes. The emotions that a child manifests in the action of learning comes not only from the school space, but from the lot of experiences expressed in the action of learning by means subjective configurations.

From this context, we highlight two types of difficulties in the school space, the difficulty for learning, which leads the child to learning by means the organization of the environment, in which the educator proposes obstacles that will be overcome by the child, by means the elaboration of activities or tasks to learning. The second type of difficulty is learning difficulties, It happens when the child cannot overcome the obstacles offered by the educator in the school space. However, the inability to overcome the obstacles proposed by the educator may have different origins.

It is in this context that we will highlight the mathematic school learning of children considered in situations of mathematic learning difficulties with considering the subjective aspects, because it is known, from research by Rossato (2009), Rossato and Mitjáns Martínez (2011), Mitjáns Martínez and González Rey (2017), González Rey (2006), Tacca (2005), that learning is not only a cognitive process, but belongs to often factors, which is part of the subjectivity of the child and that leads to different learnings, depending on the child, the context, the historical time, the relationships practiced in this process. The learning process is complex and systemic, and occurs in a person historically and culturally situated.

Methodological process

To understand how the student's development occurs in the school space, and how the difficulty is built, we took as a theoretical basis the Theory of Subjectivity by Fernando González Rey, which was built in

the attempt to understand the human psychological, not by its separation and, consequently, by its reduction to forms of expression and simple processes, but as processes of senses and meaning that point to the complexity by the multidimensional, recursive and contradictory character with they are conceived (Mitjáns Martínez, 2005, p. 15).

Based on the plasticity of the human psyche, development is a continuous process, enabling changes in the subjectivity, production of subjective senses and subjective reconfigurations. The organization of subjectivity is in constant motion, allowing the school space to be a space of student transformation and emancipation.

Based on Qualitative Epistemology, we lean on the constructive-interpretative methodology (Mitjáns Martínez & González Rey, 2017) for our research, because we emphasize the importance in a space that we can interpret the reality and construct a theoretical system.

The case study was a resource used in the constructive-interpretative process. The research was carried out in a public school in the Federal District, Brazil, with socioeconomic diversity.

An important characteristic of this school was the fact that it was a full-time school, so the class had two teachers, one in the morning and other in the afternoon. Both teachers shared the responsibility of the school subjects, teacher Michele (all the names mentioned here are fictitious), in the morning, teach the knowledge related to the portuguese language, history and geography, and teacher Rosa, in the afternoon, worked mathematic and natural science. This division was not rigid, the teacher Rosa, for example, also worked Portuguese language activities and other knowledges.

The immersion period in the research field was one and a half year, and for one year the researcher attended mathematic classes, three times a week.

The research began with the immersion of the researcher in a 3rd grade at elementary school class, with eighteen students, from eight to ten years old. The small number of students in the class was because the school is inclusive and there was a student with intellectual disabilities in the class.

An important characteristic of this level of education is the end of the Initial Literacy Block, a stage that children who have not reached the school objectives delimited for that cycle are retained, that is, they are again attending the 3rd grade. Thus, it is common at this stage for learning difficulties to show more evidence to the teachers, because there are children who after three years in the Initial Literacy Block, which comprises the first, second and third year of elementary school, who were not literate or do not have the construction of the number consolidated.

We defined four strategies for choosing students Murilo, Lia and Elisa as participants of the research, they are:

- Indication of the class teacher as a student in a situation of mathematic learning difficulties;
 - Practical Diagnostic Task about mathematic knowledge of the child's school level (3rd grade of elementary school);
-

- Written Diagnostic Task about mathematic knowledge of the child's school level (3rd grade of elementary school);
- Researcher observation in the classroom.

In this study, the concept of school learning difficulties brought by Rossato and Mitjans Martınez (2011, p. 73) was a guide in the construction of information and theoretical construction, in which the school learning difficulties are presented when the

subjective organization of the student, constituted in the dynamics of actions and relationships from different zones of his/her life, including the school, when confronted with the teaching process, does not express favorable conditions to master a system of scientific concepts in the time and the evaluation standards used in the school.

In this context, for this work, it is important the indication from the teacher about students with mathematic learning difficulties, because she represents the school institution.

When we asked teacher Rosa which students, in her assessment, had the greatest difficulties to learn mathematic, she replied: Murilo, Lia, Elisa and Lucas. Murilo and Lia were also students who in October the teacher appointed with risk to being retained in the 3rd grade, although at the end they were promoted to the 4th grade.

From the analysis of the strategies used to choose participants with mathematic learning difficulties, we constructed a table to identify the students considered in a situation of mathematic learning difficulties, Table 1.

	Elisa	Murilo	Madalena	Heitor	Davi	Paulo	Lucas	Jose	Lia
Teacher's appointment	X	X					X		X
Practical Task	X	X		X	X	X	X	X	X
Written Task	X		X						
Researcher observation	X	X	X						X

Table 1 - Identification of students with mathematic learning difficulties according the strategies to choice the participants research

To participate in the research, we selected children who presented mathematic learning difficulties in three or more choose strategies. Thus, the research participants were: Elisa, Lia and Murilo.

We worked with research instruments that avoid direct questions, using strategies that lead the child to speak indirectly about the school and family life, because in interviews with direct and very formal questions the participants often speaks what the interviewer wants to hear, becoming difficult to identify the student subjectivity.

The instruments created to facilitate the expression of children's subjectivity and the comprehension about students learning were based on Qualitative Epistemology Theory by Fernando González Rey (González Rey & Mitjás Martínez, 2017), that prioritizes conversational instruments. So, the instruments created to support the research were:

Participant observation and field notebook: The participant observation lasted two school semesters, totaling 220 hours in the classroom, from April until December 2016. In these observations we recorded in Field Notebook some indicators of learning difficulties, moments when subjective configurations emerged from the students and some actions and events that allowed the construction of indicators about the classroom social subjectivity and about students subjectivity.

Individual Meetings: After the stage of choice the research participants, Murilo, Elisa and Lia, we had individual meetings with the participants to observe and analyze how their learning processes occur and observe expressions of subjectivity in terms of mathematic school learning difficulties. Parallel to these meetings we continued the participants observations in the classroom, but while the participant observation finished in December 2016, the individual meetings continued until July 2017. The total of meeting were: six meetings with Elisa, six meetings with Lia, five meetings with Murilo and one meeting with Lia and Elisa together.

In the individual meetings we worked mathematic tasks elaborated by the researchers and sent by the teacher Rosa. The meetings ranged among 30 and 60 minutes and were held at the same time of the classes, but outside the classroom. It was in this space that we worked some research instruments. This was a space of constant dialogue between researcher and research participants.

The meetings began after 4 months in the classroom, so the creation of the social research scenario by the researcher made possible the creation of affective and trust link between the researcher and the students research participants. This link created, in a certain way, a trust relationship between the two parts, which made possible record the meetings, allowed by the children. The first meeting of each child was made only with voice recorder, the others were audiovisual recordings.

In this perspective, González Rey and Mitjáns Martínez (2017, p. 97) point out that

all filming or recording should be negotiated with the participants and they should never start in the first sessions, because the acceptance of the participants does not mean that they will feel comfortable to express themselves as they would without this record. The maturation of the links between researcher and participants and participants among themselves is another aspect for which the creation of the research scenario has an important value.

Thus, the individual meetings began when Murilo, Elisa and Lia were already motivated to talk with the researcher. At this stage Murilo and Elisa always used to hugg the researcher as soon as her arrived in the classroom, Lia took a little longer to establish a relationship of greater affection.

In the individual meetings, we worked with some research instruments to be able to identify and analyze the subjective configurations of the participants, that could indicate how the research participants' mathematic learning difficulties develop, they are:

The math for me is...: we asked all the children in the class to draw the first thing that came to their minds when they thought about mathematics. This instrument allowed by children the expression of feelings and motivations about school and mathematic.

Free conversation: This activity was done in the first individual meeting, when we permitted the children to talk about their lives, hobbies, interests, family, this was also stimulated by questions asked by the researcher, created at the moment of the dialogue, without predefined script, about daily life, family, experiences in school etc. The activity was recorded in audio.

Feelings in the school space: We perform this activity during the individual meeting. In the activity we asked the children to draw the moments that made them happy and sad at school, an instrument adapted from Rossato (2009). The instrument allowed the externalization of feelings and processes related to the school space.

What an animal he/she is... : This is a complement of sentences, widely used in constructive-interpretative research, adapted, using animal figures instead of words or phrases. We present several animal figures for children. Then we present a form containing the name of a person who is part of his/her conviviality. The forms were: father, mother, brother (puts brother's name), sister (puts sister's name), friend (puts the name of the friend), , teacher Rosa, teacher Michele, Principal, Mrs Amanda, and others, depending on the family drawing of the child. This instrument brought very rich information to help us to understand the subjectivity of children, which develops from the relationships it establishes with the people of their conviviality.

My relationships: In this activity we putted on the table several figures that represent moments or situations that could occur in the classroom, in the neighborhood, where the child socialize, or with family and friends. Children should choose the images that most closely resemble the situations asked by the researcher, like: “with your father”; “with your brother”; “with your teacher”. During the activity, the researcher established a dialogue with the children, allowing several expressions on their part.

How I feel when I'm with...: This instrument was inspired by Rossato's (2009) work. The activity consisted in the presentation by the researcher of several *emojis* to the children, which showed diverse feelings. Children should paint the *emoji* that represented their feeling when they were with some people that they socialize daily or often, answering the question "how do I feel when I'm with...?".

Monitoring of mathematic tasks: In the meetings we always did some mathematic tasks. At the beginning we planned to create activities to do with the students, something differentiated, to facilitate mathematic learning, because it is from a change in experiences that can occur overcoming learning difficulties (Rossato, 2009), however, we had some problems during the research, when the class teacher questioned our research strategies. So, we decided to work with the tasks and contents suggested by the classroom teacher, including the resolution of textbook activities and others presented by her.

The space of a paper is minimal to present all the complexity information that these instruments allowed to build, few instruments will appear in the theoretical discussion of information constructed in the field, however, this methodological composition allowed theoretical reflections and the emergence

of indicators that led us to a theoretical construction, enabling the development of new knowledges related to difficulties in mathematic learning and development in a subjectivity perspective. In this same direction, we will present just the case of Lia, that was extremely relevant in the analysis of the construction of mathematic school learning difficulties development.

Theoretical discussion: Lia and her fear of doing mathematic

In the first observation in the classroom, we noticed Lia's difficulty with the knowledge that was worked on the 1st grade and 2nd grade of elementary school, recorded in the Field Notebook in April 25, 2016.

The activity consisted of completing a table with numbers from 0 to 199. Lia, instead of writing 102, wrote 12. We evaluate that she does not yet have the structure of the number formed, analyzing her records. The concept of zero was neither constructed nor the positional value of the digit in the Decimal Number System.

In the example above we observed that Lia, who had already attended the 3rd grade, had not yet reached the knowledge necessary to record arithmetic operations, because she had not yet achieved the learning of the Decimal Number System, as well as the positional value of the digit. We started to target the investigation in direction to understand Lia's difficulties.

In the observations we identified moments when Lia paralyzed when the teacher asked her, taking lot of time to respond or after a long time giving any answer because of the pressure from the teacher. Lia's subjective configuration was to paralyze with the teacher's questions, this paralization may be fear with the situation, in which she cannot operate because of her symbolic-emotional configuration. In this direction, González Rey (2006, p. 41) points out that "fear of mistake is one of the worst enemies of current education: the student plastered in routine formulas to avoid making mistakes and ends up being unable to produce thought about what he/she learns".

This fear can lead the child to seek strategies to perform the task to satisfy the desire of teacher with an answer. Below we present two examples in which Lia shows her answers to the teacher in order to carry out school requirements.

The teacher wrote on the board the months of the year and asked several questions to students answer collectively, on a circle with the students sitting on the floor. She asked what the number of each month was, the teacher spoke the month and the students spoke the number. Example:

January, 01; February, 02.... I noticed that Lia always spoke after the other students had already given the answer. The answer was not spontaneous, but the repetition of what others answered (Notebook Field, May 2, 2016).

While doing the task from the book Lia looked to Ruth's book and copied the answers (Field Notebook, October 3, 2016).

The two excerpts represent routine situations in the mathematic activities throughout the school year, in which Lia copied the answers from her colleagues. The act of copying was recurrent, and the form of the classroom, arranged in groups of 4 or 5 students, facilitated this Lia's action, who also happened at others moments.

Thus, we observed that Lia, in a situation of mathematic activity, when it is possible, copies the answer from colleagues. She learned that in front of mathematic activity, her role is to give an answer to the teacher, regardless of the means and purpose of this answer. She copies because it does not believe in her own ability to produce a socially valid answer. In this way, she can't allow herself to have experiences that would favor learning, creating the vicious circle: mathematical activity → does not believe in her knowledge → copy → not experiencing → not learn → reinforces the lack of belief in herself.

This Lia's action happens in a given situation, but is not the result just of what is happening in the classroom, but the action of copy is due to a subjective configuration of Lia to deal with this specific situation, to do the mathematic task.

When we ask her how she feels when she copies, she doesn't deny the statement and says that she feels sad. However, she does not see herself as someone who copies the other's answer, but as someone who receives help from colleagues to perform the mathematic tasks.

In the action of solving mathematic tasks we observed two processes in Lia's subjectivity configuration, the first is that she does not participate in her mathematic learning process, since we consider mathematic tasks part of the learning process (Vergnaud, 2009a), because she copies the answers from her colleagues. Therefore, Lia is not subject in her mathematic learning process, just reproducer of the resolutions elaborated by other people. To elucidate this statement we will use as

theoretical contribution the concept of subject who learns, by González Rey (2006), a category created by the author to explain the learning processes of a person, in which

the student becomes the subject of his/her learning when he/she is able to develop a differentiated script in relation to what he/she learns and to position himself/herself critically and reflexively in relation his/her learning. This positioning will be possible when he/she is able to generate subjective senses in relation to what he/she learns. It is in this process that true constructive models will appear about the learned that will facilitate operations and own and original constructions about the basis of the learned (González Rey, 2006, p. 40).

When the student reproduce a answer without a critical and reflexive position about the concepts worked in the mathematic activity, determined by the teacher's intention about learning, Lia is not being subject who learns mathematics, because she does not allow herself to operate mathematically, she does not allow herself to try, has mistaken, mobilize concepts. "The condition of subject in the process of learning leads to the proper and differentiated organization of the learned material, which implies mistakes in this journey, which cannot be underestimated" (González Rey, 2006, p. 41).

In this context, Lia does not have the opportunity to perform any of the three types of learning listed by Mitjáns Martínez and González Rey (2017): reproductive-memoristic, understanding or creative.

However, while she is not being subject to the resolution of mathematic problems, she is being subject to generating alternatives to a situation that she has to solve, because copying is a way for her to solve the problem that appears to her: to finalize the task that the school has imposed to her. This was the second process we observed in Lia's subjective expression. So, Lia copies the answers from colleagues to deal with the situation imposed by school, solve mathematic tasks. For González Rey and Mitjáns Martínez (2017, p. 70) an important attribute of human subjectivity is "the ability of person and groups to generate new spaces of subjectivation within the normative-institutional contexts, in which their activities are developed", this is exactly what happened with Lia's subjectivity, she generates new alternatives to deal with situations that appeared in the school space, of which one of the main characteristics is to fulfill tasks, to meet these tasks it is important to give correct answers. Lia, when is in a situation of mathematic activity does not operate mathematically, because she thinks

that herself is unable to give these answers, thus she generates alternatives to confront this situation, producing new subjective senses and configuring herself subjectively to meet the expectations and intentions of the teacher Rosa, thus copying the answers from colleagues to do the task imposed by the school. In this situation Lia is being subject because, for Mitjans Martínez and González Rey (2017, p. 58) "subject is the person or group who is able to generate an alternative way to subjectivation within the institutional normative space in which it act".

The teacher's intention is that student learn, so the teacher provides mathematic tasks to Lia's solve, because it is from reflexive thinking about the problem, using the concepts and schemes that she has that this process of learning mathematic takes place, it is the mobilization of concepts in action and theorems in action (Vergnaud, 2009a) that will promote the action of the person in the resolution of mathematic activities, this process, regardless if the answer is correct or not, allows the approximation of the subject to scientific knowledge, and this is the objective of school learning. However, Lia does not go through this process, although the teacher's intention. However, Lia's ability to generate alternatives in front of the problem that arises to her shows how she is a subject capable to generate subjective senses to overcome the school situations. Thus, we observed that for the situation of solving mathematic activities, Lia's subjective configuration usually leads her to copy the answers from her colleagues, so the only answer Lia performs is the copy. Lia lacks one of the main psychological resources for the realization of mathematic learning, self-confidence.

It is important to analyze the reasons why Lia copies her colleagues' answers and not produce her own resolutions. It is important to analyze the expression of Lia's subjectivity in order to understand her development processes to devise strategies for overcoming learning difficulties. By analyzing the phenomenon in a systemic way, we can observe the construction of difficulty and it is important to interpret the context that Lia socialize.

Social subjectivity and family space

To better understand Lia's subjective configurations in the context of school mathematic learning and how was the subjective construction of this difficulty, we will know a little about the social spaces experienced by her.

Lia lived with her father and younger brother, Leon, who was six years old and is the son of the same father and mother of Lia. In addition to Leon, Lia has an older sister, on the mother's side, but who lives with her father in another state, and two more brothers on the part of her father, Jonatas and Felipe.

Living with her father and younger brother, Lia assumed various responsibilities from the house that, traditionally, in our culture, are related to female assignments, she cleaned the house, made food, take care her brother. Lia's daily life often did not allow her to experience playful activities, while playing outside her day-to-day life. Muniz (2010) highlights the importance of playing in child development and mathematic learning, it is in the playtime that the child experiences other roles, enabling subjective changes and life changes. Lia does not have many moments to experience other possibilities by mean the playful, because she spends her day at school, where she usually has the opportunity to play only in the playground time. When she get in home, household duties also take away her playtime.

The representation of the woman as responsible for domestic tasks is in the social subjectivity of her family, including her older brother, Jonatas, who often visited Lia's home and exercised the role of makes herself smaller, because of the representation that the social subjective of family about the roles of men and women, as we can observe in the passage of a dialogue during the Individual Meeting.

Researcher: Is it? And how did they hit you?

Lia: With flip-flop.

Researcher: With flip-flop? But out of sudden did they hit you? Why did he hit you? Or did you do something?

Read: I burned the rice. I used to burn the bean.
(Individual meeting, 24 November, 2016)

In this specific situation Lia reported that the brother were having a barbecue for friends, and she was responsible for make the rice, which burned, a situation in which she made a mistake and should be punished because of this.

In the previous dialogue we highlight one of the situations in which Lia relates the physical punishments against her, starring primarily by her brother Jonatas. These relational moments with the brother were very significant for us to understand Lia's subjectivity and mathematic difficulties, and also very striking for her in her constitution as a subject.

We observe throughout the dialogues the influence that Jonatas had on her subjectivity, which influences the learning of mathematic. In the instrument "What animal is...", in which Lia could to choose an animal for each family member or people of her socialize, Lia chose a brave rhinoceros (figure 1) for Jonatas and pointed out that he hit her

Figure 1 - Animal chosen for brother Jonatas

Researcher: Then choose an animal for Jonatas

Lia: (catches a rhinoceros with a brave face).

Researcher: What animal is this?

Lia: A rhinoceros.

Researcher: And what does rhinoceros like?

Lia: It's brave.

Researcher :Your brother is how old is Jonatas?

Lia: Twenty.

Researcher: Do you think he's angry?

Lia: (shakes your head like say yes)

(Individual meeting, 27 October 2016)

After this observation we created new instruments to better understand this relationship. In the instrument "My relationships" Lia chose the following figure (figure 2) brother Jonatas.

Figure 2 - Relationship with brother Jonatas

During the activity we produce the following dialogue:

Researcher: What is he doing?
Read: Yelling at me.
Researcher: Was he just yelling with you?
Lia: (shakes your head like say yes)
Researcher: Or did he hit too?
Lia: Hit too.
Researcher: And did you do anything else besides that?
Lia: (shakes your head like you say no)
(Individual meeting, July 3, 2017)

On this subject Lia always spoke with her head down and with few words, often summarizing her communication by shaking her head to say yes or no. This was a very sensitive subject, to which Lia probably would not speak in an interview. In the same dialogue she reported that she did not speak to her father or mother, although she always commented this situation with her friends, Elisa had already told the researcher about this situation. Lia, until then, had not spoken to teacher Rosa, who was surprised when the researcher told her about what Lia told in the meeting. At the meeting on November 24, 2016 Lia reported that the brothers were no longer hitting her, because her father had talked with her brother Jonatas, but the feeling such events produced are still part of her subjectivity. In the instrument "How do I feel when I'm with..." (Figure 3) Lia chose the sad feeling for brother Jonatas.

Figure 3 - How Lia feels when she is with her brother Jonatas

Thus, we observed that Lia's social context marks a strong relationship between mistake and punishment, since she was punished through physical punishment when make a mistake.

Social subjectivity of school and classroom

From the fieldwork, we could observe that there are several social subjectivities in the school, including the classroom social subjectivity, established in the relationship that the students have with each other, the teacher with the students, the researcher with students and teacher, which means, the relationship between various individual subjectivity produce a social subjectivity in this classroom, space which the individual subjectivity is influenced and influence the social subjectivity. It is evident that when the participants of a space change, the processes of both, social and individual subjectivities, change as well: there are no two equal subjects, as there are no two congruent groups. These different configurations of social subjectivity are clear in the playground, a space in which the absence of extreme control allows the establishment of different relationships between children. As González Rey (2011, p. 116) highlights

the character that generates human action is not only a production performed with others, it has an essential core of symbolic-emotional character in each of the people who act in each social

space, that is, individual productions are simultaneously essential moments of all social production.

Therefore, Lia produces social subjectivity at the same time she is socio-cognitively-emotionally constituted by it, because it is the relationships established in these spaces that will allow the production of subjective senses and the expression of subjectivity.

Throughout the research, Lia's behavior changes depending on the space within the school, for example, when she is in the classroom and when she is in the playground time. In the individual meetings with the researcher, Lia's behavior was very close to what she has when she is in classroom. Usually in the classroom Lia has retracted behavior, speech few words, but in the playground is extroverted and talks a lot with her friends, is very sociable. Subjective configurations are related to the experiences that an individual has in his/her relationships, with the context in which he/she socialize, so often when a person changes the context, the behavior changes as well, because the subjective senses emerged in the new situation or experience. We must highlight that these behaviors are not a result from certain environment stimulus, like some psychological theories suggested, but it is because of subjective organization, of how it represents each space and the role in each one, taking into account the desires, needs, possibilities, limits and difficulties. The situation in which Lia is inserted permit that subjective senses to be organized in such a way that Lia expresses a withdrawn behavior in the classroom environment and an extroverted behavior in the playground time, even these two moments being part of the school environment.

A very striking feature within the space of the classroom surveyed was the way in which the teacher talk with the students, often yelling with them, as we can observe in some moments described in the field notebook:

The teacher yelled with Murilo because he didn't do his homework and couldn't finish the task that teacher Michele gave in the morning. Teacher Rosa said that if he continue in this way he would not pass the grade, which will only pass to the 4th grade who can do all the tasks. She said that three times in a very high tone (Caderno de Campo, October 17, 2016).

There were several moments when Teacher Rosa yelled with the students. The children often see this screams as something bad, as we can observe in the picture that Lia chose to represent teacher Rosa, from the instrument "What animal is..." (figure 4).

Figure 4 - Animal representing teacher Rosa

The activity generated the following dialog:

Researcher: (gave the name of teacher Rosa)

Lia: (glues the figure of a dragon)

Researcher: What animal is this?

Lia: A dragon.

Researcher: What does the dragon like? What does the dragon do?

Read: Breathe fire.

Researcher: Breathe fire, and what else? ... Is he good or bad?

Read: Good.

Researcher :Good?

Lia: (shakes your head like you say yes)

(Individual meeting, 27 October 2016)

The teacher's scream is represented by Lia with means the dragon, the breathe fire is the words that teacher Rosa propagates through the classroom in a very loud tone and with words and sayings that can hurt someone. We first tried to ask about the animal, not about the person, in order to indirectly achieve some representations that Lia had about her relationship with the others people in her context.

We observed that the teacher exercises power over the student in the classroom, causing Lia to produce several subjective senses in this context, that we could observe by mean the subjective configurations, which is a space with a unique social subjectivity, produced by mean different individual subjectivities that act there, as Mitjáns Martínez and González Rey observed (2017, p. 92).

In school, the classroom is a place of production of a social subjectivity that is not reduced to the process of relationship between students and students and teacher-students. The classroom space is permeated by the systems of power, normative, technical and relationship in which the social subjectivity of the educational institution is expressed. Together with this, both, students and

teachers, are carriers, in their individual subjective configurations, of multiple subjective senses that express other spaces of social subjectivity, such as family, community, society as a whole, etc.

The social subjectivity is built by means a complex, dynamic and flexible network of relationships, in which different people interact with each other and with the environment.

From the dialogues with Lia we observed that her brother Jonatas hit her when she made some mistake. Another aspect we should highlight is Lia's view of the teacher, choosing the figure of a Dragon to represent her, describing the dragon as a person who breathe fire, characteristic of teacher Rosa, who repeatedly yelled at Lia in an aggressive tone. In both situations Lia was being punished for something that she did, some attitude or behavior, so Lia realizes that her attitudes have punitive consequences, but it is not any attitude, but the attitudes that do not correspond the desire of the other, in the case of the brother and teacher, so Lia finds herself in a situation in which the mistake will bring her punishments, whether verbal, physical or removing something that she likes, so Lia avoids the mistakes as much as possible. The way to avoid the mistake is to copy the mathematic tasks answers from her friends, who knows more than she does, in Lia's view. In this context we can say that Lia copies the mathematical answers from her friends to avoid punishment. Copying Lia will not take a mistake, if there is a mistake it was not her produced, and therefore can not be subjected to punishment, on the contrary, it should be recognized as a student who is active and responding, even if it does not generate the necessary learning for its development.

The subjective senses produced in the family environment, school, social places etc, emerge at the moment of mathematic tasks and are configured in such a way that Lia, as a subject, to reduce the possibility of punishment, generates as an alternative, the attitude of copying the answers. Here it is clear how the actions of the person in performing mathematic tasks, based on the resolution of problems that favor the development of concepts and procedures, are not only the result of an intentional action of the teacher, but is influenced by the experiences that the person had that goes beyond the walls of the school. González Rey and Mitjás Martínez (2017, p. 142) highlight that

The process of subjectivity development is complex not only because the person is simultaneously immersed in different and often contradictory systems of communication activities (family, school, friends, etc.), but because, once the subjectivity is constituted and develops, it participates

in the subjective configuration of these influences, becoming an active element of its own constitution and development. Thus, experiences and influences that acquire potential value for subjective development are those that are subjectified, those in relation to which subjective senses are generated.

Therefore, several experiences and influences of the person generate subjective senses that will emerge in subjective configurations in often school activities, regardless if these subjective senses were produced in school or outside it. It is within this perspective that I would like to highlight the emotional character in mathematic production. The subjective sense is a symbolic-emotional unit, and we know that the subjective configuration of performing mathematic activities in school environment from Lia is strongly loaded with negative emotions, I do not mean here that all negative emotions will produce negative attitudes, but I want to highlight that in Lia's case the negative emotions generated in certain experiences led her to an attitude of not subject in mathematic learning situations. Vigotski (2010, p. 143), already highlighted that "no form of behavior is as strong as that linked to an emotion. Therefore, if we want to raise in the student the forms of behavior that we need we will always have to worry about these reactions leaving an emotional trace in this student". For Lia these emotions left traces that hindered her mathematic learning, because her contact with mathematic is not as subject, but as a person who reproducing answers from other people.

It is important to highlight that for Lia It was a way to resolve the situation, so at no time, for her, this was taken as a way to deceive the teacher, or try to "get along". It was the way that she configured herself subjectively to overcome the situation, which did not occur in isolation, but in the relationships that she had with her friends.

When she reproduces a answer without a critical and reflective position about the mathematic concepts Lia is not a subject who learns mathematics, because it does not allow herself to operate mathematically, she does not allow herself to try, to have a mistake, use her concepts.

After the researcher intervention, in the individual meetings, we observed that the validation and valorization of existing concepts is a means to raise Lia's self-esteem and self-confidence, allowing her to operate mathematically.

Final considerations

For Mitjáns Martínez and González Rey (2017, p. 69) "the subject category refers to the person in his/her character active, conscious and intentional". Thus, for a child to be a subject who learns, it is necessary to be active about his/her learning, so it is necessary exist a comprehensive or creative learning (Mitjáns Martínez; González Rey, 2017). However, as much as Lia is not a subject who learns during mathematic activities, to deal the demands of school institution, she creates subjective alternatives, becoming subject in the situation, but not necessarily subject to her learning. In Lia's case, the copy was an alternative created in the situations in which mathematic activities appeared, which promotes learning difficulties, because it prevents Lia to produce mathematics, overcame the necessary obstacles for the development of concepts.

Thus, the family context and the relationship that Lia has with her brother and the school context and the social subjectivity of the classroom contribute to the production of subjective senses that limit Lia's learning, and often are configured in order to lead the child to move away from the relationship with mathematic knowledge, obstructing the possibilities of learning, which take place exactly in the child's contact with mathematic activities. In this way Lia' subjectivity configuration built a difficulty to learn mathematic, stopping her learning.

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