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## Exploring Childhood Cognitions Through the Contents of Childrens Thoughts Related to Anxiety: A Qualitative Approach

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### Abstract

**Aim:** The main aim of this study was to explore the contents of children's cognitive products (positive and negative thoughts) related to stories that describe anxiety situations.

**Method:** The final sample was composed of 274 children aged between 10 and 11 years ( $M = 10.62$ ,  $SD = 0.5$ ) from a Portuguese community sample. The Portuguese version of the Nine Ambiguous Stories was used. Children's responses to the stories were analyzed using mixed content analysis - the pre-categories and categories were established a priori, the sub-categories emerged from the material. The agreement rate of the main coders had Intra-Correlation Coefficients above 0.97 ( $p < 0.05$ ). Response units were analyzed regarding their frequency and specific contents.

**Results:** Content analysis provided 6,665 recording units of cognitive response allocated to 75 different subcategories. In the nine stories, every positive and negative thought contained expressed emotions. Other contents were also found and divided into 57 sub-categories; 32 were related to negative thoughts and 25 to positive thoughts.

**Conclusion:** The large number of recording units within the dimension of expressed emotions highlights their importance when studying children's cognitive characteristics. Negative thoughts' contents suggest that beliefs related to factors of vulnerability may contribute to higher anxiety symptoms. Some contents of positive thoughts demonstrate the existence of positive beliefs related to characteristics of childhood development that are more stable and that can contribute to the development or maintenance of adequate anxiety manifestations.

**Keywords:** Child; Anxiety; Thoughts; Cognitions; Cognitive products contents

### Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed., DSM-V; American Psychiatric Association, 2013), "anxiety disorders include disorders that share features of excessive fear and anxiety and related behavioural disturbances" (p. 180). Fear and anxiety are distinct constructs as "fear is the emotional response to real or perceived imminent threat, whereas anxiety is anticipation of future threat" (American Psychiatric Association, 2013, p. 180). Moreover, some fears and anxieties that children experience in their normal developmental course are typical and even desirable, when they are not excessive [1-3]. These fears and anxieties are usually considered a normative emotional response designed to facilitate self-protection and child adjustment [1-3], revealing an appropriate interpretation and analysis of events and an adequate reaction to them [4].

The role of cognition in the understanding of anxiety disorders has been emphasized in the last decades by different theories [5-10]. One of the most important theoretical proposals was the one made by Beck et al. that explains cognitive anxiety features focusing on fears, loss of control and inability to cope and considering these features as

expressions of the cognitive set of danger and vulnerability [5]. According to the authors, the individual's perception, interpretation, association and memories at a certain moment are based on simple or more complex schemas that contain a variety of rules, beliefs and assumptions that define the anxious cognitions [5].

This work from Beck et al. was used by two major cognitive approaches as the initial basis to understand anxiety-related cognitions in children: the cognitive behavioral theories and the information processing perspective [11]. These two currents have been used in a great number of studies to analyze the cognitive characteristics associated with childhood anxiety and anxiety disorders [12-15].

Despite the extensive research on the theme, the results have been inconsistent and even controversial [16]. Many studies have used adult models to understand cognitive anxiety features in children [16-18]. However, many of these features may not reflect adequately children's features [17] as they may actually be different [13]. Several authors have suggested that it is important to gain further knowledge on the cognitive aspects of children's anxiety [16,19,20].

In this sense, the work developed by Bögels and Zigterman [21] was innovative as they analyzed the contents of biased cognitive products or, as defined by the authors, the contents of children's dysfunctional cognitions. Specifically, Bögels and Zigterman [21] investigated the thoughts of children and adolescents aged between 9 and 18 years that

revealed cognitive products related to generalized anxiety, separation anxiety and/or social phobia. They used nine ambiguous scripts developed by the authors that presented potentially threatening situations for the three types of anxiety. The authors classified children's cognitions as positive, negative and neutral. The negative or dysfunctional cognitions were categorized according to their content, using previous theoretical knowledge about adults' negative cognitions that are related to the overestimation of danger and the underestimation of the person's competence and coping abilities as guidelines. Results indicated that biases in children's interpretations were more related to an underestimation of their own ability to cope with the situation than with an overestimation of the danger of the situation [21]. The authors found that children believe they are targets of criticism and rejection; they have thoughts of guilt and believe that their social performance is inadequate. Thus, Bögels and Zigterman's [21] study has demonstrated that an open question such as "What would you think if you were in this situation?" is an effective strategy to access relevant information on dysfunctional thoughts related to the potential threat of the situations and about the self and children's beliefs about their inability to influence the situation [21].

Some studies have been developed resorting to similar methodologies and have been considered in the analysis of dysfunctional thoughts related to the potential threat of situations and the child's inability to cope with the situation. For example, Waters et al. [15] compared interpretation biases related to negative emotion, danger judgments and influencing ability, in children aged 9-13 years old, before and after a cognitive behavioral treatment. Results showed that the only significant change happened on children's beliefs about their ability to influence the situations. Moreover, Creswell and O'Connor [12] investigated the threat interpretation biases and anticipated distress level of children aged 10-11 years from a community sample, in three different moments (5-6-month intervals). The authors used 12 ambiguous situations with one open-ended response question about threat, and one question where children had to report their anticipated level of distress (from 1 to 10 points) for each situation. The analysis of the child's view that he or she will not be able to cope with the situation was made through the child's level of anticipated distress. The authors further observed that anticipated distress was significantly associated with anxiety in the three assessment moments, but the interpretation of threat was significantly related to anxiety only in the second and third moments.

Despite the use of similar methodologies, many studies only assess the biased interpretation processing of the threat by coding the children's responses as closed responses (e.g. threatening vs. non threatening), even when using open-ended questions [15,22-24]. Thus the attainment of knowledge on children's opinions, perspectives and feelings is limited.

Furthermore, the study of cognitive products has focused only on their counting and comparison of frequency between negative thoughts (i.e. negative cognitive products) and positive thoughts (i.e. positive cognitive products) in order to ascertain possible connections between their frequency and different anxiety levels [25-27]. However, the results found in literature are inconsistent and further studies are needed to clarify this connection [11,16,25,28].

There is also a lack of research focusing on the valences and contents of childrens' thoughts when trying to understand the cognitive features related to anxiety in children; however, these aspects are important sources of information [21,28,29].

In this sense, the present study aimed at exploring the contents of children's positive and negative thoughts related to ambiguous stimuli or stories that were constructed according to considerations about childhood anxiety [21]. We intend to perform an exploratory analysis having the child's perspective as a bottom line and using methodologies that are appropriate for children as suggested in literature [16-18,30]. The analysis and classification of the emergent contents has an underlying consideration of the child's context, age and developmental course.

## Method

### Participants

A total of 478 children from a community sample of Terceira Island-Azores (Portugal) were invited to participate in the study. Their parents were contacted by telephone by the main researcher. Information concerning the study was provided and doubts were clarified. From this first contact, 302 children and their parents agreed to participate in the study. A day and time were scheduled for each family's participation. However, 24 eligible families were not able to participate due to scheduling issues.

A total of 278 children participated in the beginning of the study, after informed consent was obtained from the children and their parents. Then, four children were excluded after the interviews, as two had been diagnosed with significant developmental problems and other two did not complete the interview. The final sample was composed of 274 children (151 girls and 123 boys), from the 5<sup>th</sup> and 6<sup>th</sup> grades (middle school), aged 10 and 11 years ( $M = 10.62$ ,  $SD = 0.5$ ).

The participants had to be on that age range and present normative development to be included in the study. The criterion for selecting the age range takes into account that basic developmental abilities have clear and direct implications in the investigation of the cognitive anxiety features [16] and that certain abilities related to these variables are developed only after the age of 9 [31]. This age selection was further supported by the need for research of these variables with children under 12 years old [19].

The researchers selected a community sample because it gives access to normative and expected development, which will then allow to accurately determine whether certain characteristics are inappropriate, excessive and dysfunctional or not [17,32-34].

### Instruments

A socio-demographic questionnaire was used in order to characterize the sample under study (e.g. gender, age). The Nine Ambiguous Stories (male and female versions) [21] were used as data collection instruments.

The Nine Ambiguous Stories were developed by Bögels and Zigterman [21] and present nine situations that are potentially threatening for children. They are ambiguous because their outcome is uncertain. The stories are related to specific anxiety situations: three stories (1,4,7) concern generalized anxiety situations; three of them (2,5,8) describe separation anxiety situations, and other three (3,6,9) present social anxiety situations. Previous studies have supported the validity of the stories [21]. The adaptation and translation of the Portuguese version of the Nine Ambiguous Stories [21] followed the standards recommended for the translation of instruments in cross-cultural research [35]. Each story was translated from its original

English version to Portuguese by a bilingual translator (psychologist), who was familiar with the cultural context where the original instrument was developed as well as with the Portuguese context. A second bilingual translator and psychologist (also familiar with both cultural contexts) blindly back-translated each story into English. The authors reconciled the versions into a single version.

To keep the procedure as unbiased as possible, the Portuguese version of the Nine Ambiguous Stories was presented to the children in audio format (male or female Portuguese versions, according to the child's gender).

## Procedure

Every child and parents went to a previously arranged location and met with the main researcher, who was a female psychologist (40 years old). This researcher implemented the study's procedure with every child. The study's objectives and procedures were explained and any questions or doubts were clarified. No incentives were given and the anonymity of the participants was ensured. Written informed consent was then obtained from the parents and the child, and the researcher ensured the confidentiality of all information provided by the child.

The main researcher conducted the interviews with each child in a private space especially prepared for the study. At the beginning of this interview, the child completed the socio-demographic questionnaire. Then the child listened to the Nine Ambiguous stories and was instructed to imagine that the situation described in the story happened to him/her ("What would you think if you were in this situation?"). The researcher wrote down the child's answer verbatim. In the end, the researcher thanked the children for their participation in the study.

The data collection covered a period of 12 months. Each session lasted for one hour.

## Data Analysis

The children's answers to the Nine Ambiguous Stories were submitted to content analysis [36]. In this specific case the authors used a mixed content analysis technique, as the pre-categories and categories were established a priori, and based on the instrument used; the sub-categories emerged from the material.

The pre-categories were defined regarding the nine stories, and the categories' structures were based on the classification of the children's cognitions according to their positive, neutral or negative valence, as proposed by Bögels and Zigterman [21] and based on Cacciopo and Petty [37]. Each cognition was considered desirable or undesirable, as a negative or positive association, and as a positive or negative affection, taking the existing knowledge on children's normal development and their contexts of life into account [28]. The establishment of the sub-categories and further coding were performed using Bardin's content analysis techniques [36].

First, the author read the materials once to get familiar with the contents (pre-analysis). This was followed by an exploration phase, where the material was read again, line by line, to identify the recording units (r.u.). The third phase consisted on coding the material, which implies a reorganization of the raw data into categories (r.u.'s were identified, classified and aggregated according to their contents) [36]. The pre-categories, categories and sub-categories were mutually exclusive, homogeneous and pertinent for the study [36].

The validity and reliability of the categorization process and the exhaustion of the material were ensured [36,38] as the main researcher coded part of the data to roughly establish the sub-categories.

After that, 20% of the material was coded. Ten percent of the interviews were coded by the main researcher and two judges (clinical psychologists with knowledge in the childhood anxiety area) to establish the final codification grid (pre-categories, categories and sub-categories). Then, using the grid, the main researcher coded the other 10% of the material, which was re-coded by the two judges independently. Any disagreement in the coding was solved by returning to the material and to a fourth independent judge [36]. The agreement rate of the three main coders after coding 20% of the material was high for all sub-categories, with Intra-Correlation Coefficients above 0.90 ( $p < 0.05$ ), which were calculated using SPSS Statistics (v. 20, An IBM Company).

The coding of the remaining 80% of the material was performed by the three main coders, with occasional discussion and recoding of parts of the material. Some doubts were discussed among the three main coders and then also with the fourth coder.

The codes were presented per story in order to analyze the cognitive characteristics of children in relation to the ambiguity of each specific situation, thus considering that fears and anxiety are influenced by the context and may be partially inferred from an understanding of each situation's unique task demands [39].

Chi-Square Tests for Independence were calculated to analyze if the number of children who presented positive and/or negative or absent expressed emotions depended on the story. Differences considered significant when  $p < 0.05$ .

## Results

A total of 6,665 recording units were obtained from the content analysis of the responses provided by the 274 children. There were 4,063 recording units classified as negative thoughts, 2,570 as positive thoughts, and 32 as neutral thoughts. Due to the low number of neutral thoughts, they will not be used in further analyses. According to their contents, negative thoughts were allocated into 41 subcategories and positive thoughts into 34 subcategories.

Global results show that 18 of the 75 subcategories are related to the expression of emotions and that there are recording units of these subcategories in all of the nine stories (Table 1).

Expression of Emotions		
	Positive Valance	Negative Valance
Story 1	237	220
Story 2	60	90
Story 3	81	82
Story 4	39	108
Story 5	59	178
Story 6	39	33
Story 7	5	97

Story 8	11	163
Story 9	87	130

**Table 1:** Recording units frequency of expression of emotions per story.

The analysis of thoughts that presented expressed emotions was done according to their frequency by children. Results about the number of children that presented no positive or negative expressed emotions, who presented only positive or negative expressed emotions, and the number of children that presented both positive and negative expressed emotions are presented in Table 2.

	Absence of Emotions	Only negative	Only Positive	Positive and Negative Emotions
Story 1 (A)	41 (15%)	79 (28.8%)	81 (29.6%)	73 (26.6%)
Story 2 (B)	155 (56.6%)	64 (23.4%)	47 (17.2%)	8 (2.9%)
Story 3 (C)	143 (52.2%)	57 (20.8%)	61 (22.3%)	13 (4.7%)
Story 4 (D)	164 (59.9%)	78 (28.5%)	28 (10.2%)	4 (1.5%)
Story 5 (E)	108 (39.4%)	114 (41.6%)	34 (12.4%)	18 (6.6%)
Story 6 (F)	218 (79.6%)	25 (9.1%)	26 (9.5%)	5 (1.8%)
Story 7 (G)	190 (69.3%)	79 (28.8%)	5 (1.8%)	0 (0.0%)
Story 8 (H)	147 (53.6%)	116 (42.3%)	8 (2.9%)	3 (1.1%)
Story 9 (I)	95 (34.7%)	94 (34.3%)	72 (26.3%)	13 (4.7%)

**Table 2:** Frequency (%) of the different recorded expressed positive and negative emotions by the enrolled children.

The results show that the number of positive and negative expressed emotions was not independent from the stories ( $\chi^2(24) = 649.98$ ;  $p < 0.001$ ). This means that there was a greater number of children that presented positive expressed emotions in story 1 ( $p < 0.05$ ). There was also a greater number of children that referred more negative than positive expressed emotions in stories 5 and 8 ( $p < 0.05$ ). The absence of either positive or negative expressed emotions occurred in every story and in a greater number of children in stories 3,4,6,7 and 8.

Next, the contents of the subcategories related to expressed emotions and other contents within the situations that describe generalized, separation and social anxiety are presented. Some examples of children's verbalizations concerning the most relevant subcategories are also given.

### Subcategories with negative and positive valence related to expression of emotion

Nine subcategories were designated as Expression of Emotion with Negative Valence and include a total of 1,962 recording units. The contents of this subcategory include emotions, feelings and affection that are related to children's fears, distress, anxiety, nervousness and worries about the stimulus. Here are some examples of these negative emotions derived from each story: "I was afraid" (A2.1); "I was worried about my parents" (B2.1); "I felt really nervous" (C2.1); "I was very scared" (D2.1); "I was afraid" (E2.1); "I felt fear" (F2.1); "I would feel

immediately distressed" (G2.1); "I felt very nervous, because I was not seeing her" (H2.1); "I felt really nervous" (I2.1).

The other nine subcategories were designated as Expression of Emotion with Positive Valence and include a total of 618 recording units. This refers to emotions, feelings and affection associated with joy, enthusiasm and excitement, some concern and nervousness, and empathy that show that the child is sad or worried about other people. Here are some examples of these positive emotions derived from each story: "I felt sorry for those children", "I felt a little worried about those people", "I thought that it was a sad situation" (A1.1); "I was happy for sleeping over in a friend's home", "I was excited" (B1.1); "I was happy for staying in that club", "I think I would feel a little embarrassed, because everyone was staring at me" (C1.1); "I did not worry very much", "I felt a little nervous", "I was excited to make the test" (D1.1); "I was worried, because she was in bed for more than a week", "I was sorry for my mother, she had been ill for a very long time", "I was sad, because she was ill" (E1.1); "I felt very happy", "Anxious, because my birthday was finally coming" (F1.1); "I felt a little worried" (G1.1); "I felt happy, because we were going to buy a jacket and I could choose it", "I was worried, because it was a strange city, a big store" (H1.1); "I was a little embarrassed" (I1.1).

Besides expressed emotions, other 57 subcategories of content were found. From these subcategories, 32 include contents with negative valence, with a total of 2,962 recording units, and 25 subcategories are composed of contents with positive valence, with a total of 1,952 recording units. In the next section, subcategories are presented according to their valence and type of anxiety described in the stories. There are also some examples of children's verbatim statements that compose each subcategory.

### Subcategories of negative valence related to generalized anxiety situations

Considering stories 1(A), 4(D) and 7(G), the subcategory Exaggerated Investment and Failure (D2.2 = 210) is the one that presents the highest number of recording units; it is followed by subcategory Performance Difficulties (G2.2 = 165) and by Negative Event (A2.2 = 119). The number of recording units increases when the counts of the subcategories Possibility of Physical and Material Damage (A2.3 = 89) and Physical and Material Damage (A2.4 = 59) are added. There is also a considerable number of recording units in subcategory Negative Consequences of the Situation (G2.5 = 154).

Examples of the contents of each subcategory per story with the highest recording units are presented below. Children revealed Exaggerated Investment and Failure (D2.2) when they said: "I thought I had to study harder; "I thought I had to study during the night"; "I was going to get the test and not know the school subject"; "I thought I was going to fail (in the test)". Performance Difficulties (G2.2) were visible in the following sentences: "I wander from one place to another, trying to remember how to do it"; "I didn't know the time, so I could leave it there a little more"; "Why wasn't I careful?"; "Why did I have to see TV instead of remembering the time to turn off the oven?". In Negative Event (A2.4), they said: "it could happen in our island and be even worse", "I would watch the news and think that the same would happen on Terceira Island", "I thought it would happen to me".



### **Subcategories of negative valence related to separation anxiety situations**

In stories 2(B), 5(E) and 8(H), the three subcategories with the highest number of recording units include similar contents. The one with the highest count is Difficulty with the Separation from the Mother (H2.2 = 185), followed by subcategory Difficulty Accepting the Separation and the Situation (E2.3 = 150) and subcategory Difficulty with Separation and with the General Situation (B 2.2 = 101). In story 5 (E), subcategories Possibility of Physical Damage (E2.4 = 97) and Physical Damage (E2.5 = 82) altogether make the highest number of recordings units in this story (179 r.u.). In story 8 (H), the subcategory Abandonment also presented a high number of recordings units (H2.3 = 111).

Examples of the contents of the subcategories per story with the highest recording units are presented below. For Difficulty with the Separation from the Mother (H2.2), children verbalized: "I thought I would never see my mother again"; "I was completely lost". They demonstrated Difficulty Accepting the Separation and the Situation (E2.3) when they said: "I wouldn't be able to see her"; "I didn't want her to be there alone"; "I thought I hadn't done anything wrong and she sent me away"; "I thought 'why she was being so aggressive to me?"; "I thought that she didn't care for me". In subcategory Difficulty with Separation and with the General Situation (B2.2) children said: "I've never wanted to spend the night in my friend's house"; "Why didn't they take me with them?"; "I thought that I wanted to go with my parents"; "I thought they were going to leave me forever"; "I thought they would never come back".

### **Subcategories of negative valence related to social anxiety situations**

Regarding situations 3 (C), 6 (F) and 9 (I), the subcategory with the highest number of recording units is Difficulty in the Relationship with Peers (C2.2 = 238), then Difficulty Due to Evaluation and Look from the Others (I 2.2 = 148) and at last Insecurity Regarding the Situation (F2.3 = 99). Examples of the contents of these subcategories are given below.

In Difficulty in the Relationship with Peers (C2.2) children stated: "because they could have a bad impression on me"; "I thought they would think I am too fat to be a ballet dancer"; "They must think I am not good doing ballet"; "They could start mocking me"; "I think they will not get along with me"; "They would say something so that I couldn't play". They demonstrated Difficulty Due to Evaluation and Look from the Others (I2.2) when they said: "I think why were all those people looking at me"; "that people stared at me and laughed"; "that they would laugh and mock"; "that people would think that I'm clumsy". Insecurity Regarding the Situation (F2.3) was revealed in statements like these: "Maybe they don't want to go to my party"; "They think the party will be boring"; "I thought that they don't want to go to the party and that they are not willing to go".

### **Subcategories of positive valence related to generalized anxiety situations**

Considering situations 1(A), 4(D) and 7(G), subcategory Interest, Involvement and/or Recognition of the Situation (A1.3 = 121) had the highest number of recording units, followed by subcategory Investment (D1.4 = 86) and subcategory Reflection on the Situation (G1.4 = 76). If Individual Performance (G1.2 = 51) and Performance

Resorting to Other (G1.3 = 49) were counted together, the number of recording units would be higher (100).

The following sentences are an example of subcategory Interest, Involvement and/or Recognition of the Situation (A1.3): "I would like to know what was happening"; "I thought why that happened to those children"; "How would people be after the earthquake". For subcategory Investment (D1.4), children said: "I thought I would have a good grade, because I was good in math"; "That I was going to study math so that everything would turn out well during the test"; "That I had to prepare myself". They showed Reflection on the Situation (G1.4 = 76) when they stated: "I thought how the cake was"; "Is it burnt?"; "Is it uncooked?"; "Has time already passed?"; "I thought about what my mother had told me"; "What am I going to do now?".

### **Subcategories of positive valence related to separation anxiety situations**

Taking into account situations 2(B), 5(E) and 8(H), it was found that the subcategory per story with the highest count of units is Acceptance of the Separation and of the General Situation (B1.2 = 197), followed by subcategory Recognition of the Situation in (E1.4 = 110) and subcategory Reluctant Acceptance of the Situation (H1.4 = 96).

In story 5 (E), subcategory Acceptance of the Separation (E1.2 = 61) presented a considerable count of recording units. If the counts of subcategories Ability to Deal with the Mother's Absence (H1.2 = 47) and Strategies for Resolution of the situation (H1.3 = 92) were added, the final count of recordings units would be higher. Examples for subcategory Acceptance of the Separation and of the General Situation (B1.2) are presented here: "I thought it was right"; "I didn't mind and I easily slept there"; "I was going to have fun, because I don't have siblings and it would be good to play with someone". Showing Recognition of the Situation (E1.4), children said: "It was a difficult situation to her"; "I thought that my mother wanted to rest and didn't want noise, because she was ill"; "I understood that she was ill". Revealing Reluctant Acceptance of the Situation (H 1.4), they stated: "I thought my mother had gone to get something and didn't call me"; "I thought my mother could have gone to search for me somewhere else"; "That I didn't know where she was"; "That I should be more careful".

### **Subcategories of positive valence related to social anxiety situations**

In situations 3 (C), 6 (F) and 9 (I), the subcategory that presented the highest number of recording units was Confidence and Interaction with Others (F1.2 = 222). In spite of having fewer recording units, subcategory Confidence in the Resolution of the Situation (I1.3 = 46) revealed contents related to children's confidence. Subcategory Acceptance of the Relationship with Peers (C1.2 = 191) also presented a high number of units in this group of stories.

Examples of the contents of the subcategories with the highest recording units are presented below. For Confidence and Interaction with Others (F1.2): "That I was going to invite them"; "I think they want to go to my party"; "I thought they would say that they could go"; "I thought I was going to have a lot of fun with them"; "Some of them may be on holidays and not attend the party". They demonstrated Acceptance of the Relationship with Peers (C1.2) when they said things like: "I think that they say that I would be one more element to their team"; "I thought they would accept me the way I am"; "I would think it would be good to meet them"; "I think they are staring at me because they don't know me". Revealing their Confidence in the

Resolution of the Situation (I1.3) they stated: "I thought that I was going to arrange things and take one with me"; "Arrange them and keep on going". Concerning Recognition of the situation (I1.4) the following statements were recorded: "I thought about what I was going to do"; "I thought that these things happen"; "It could happen to anyone"; "Everyone drops things"; "It wasn't my fault".

## Discussion

The present study adds information to the understanding of cognitive anxiety features in children. Advances over the existing research regarding these characteristics were presented by Valadao-Dias et al. [28] whose work was in line with previous studies [16,21]. Yet the authors highlighted the need to extend knowledge on this area and to further analyze the contents of children's thoughts, their positive and negative valence when exposed to ambiguous stimuli constructed according to considerations on childhood anxiety [21].

The present study demonstrated that each specific situation was associated with certain contents, although similar contents were found in different stories. These results are congruent with the considerations from Barrios and Hartmann [39] that suggest that fears and anxiety may be partly influenced by children's understanding about the specific characteristics of each situation.

## Contents of Expressed Emotions

The results of the present study showed that children's thoughts include many contents that report the expression of emotions. These results are also in line with some considerations pointed by Alfano et al. [16]. They observed that children with ages between 8 and 12 years, but also older adolescents, frequently report emotional feelings when they are asked about the specific content of their thoughts. In stories 5 and 8, a higher number of children reporting negative expressed emotions was found. These results suggest that both stories evoke higher levels of anxiety due to the intensity of the story itself. Contents related to affection in children's thoughts were also observed in the construction process of the Children's Automatic Thoughts Scale (CATS) [40], although that kind of items were removed during the development of the scale's dimensions. Many studies concerning this topic address the cognitive characteristics related to anxiety, even if they do not consider the assessment of the emotional component [25,40,41]. Consequently, the results of the present study raise some questions about the strategies that are being used to study children's cognitive products when the expression of emotions is not considered and how the derived information may be incomplete or biased. This study also aimed at meeting the need identified by Alfano et al. [16] concerning the presence of emotional contents in children's thoughts.

Throughout the analysis of thoughts, other contents with positive and negative valences besides the expression of emotions were found.

## Contents with negative valence and features of the anxiety diagnosis

Among the subcategories with negative valence, those with the highest number of recording units (according to the type of anxiety described in the story) were composed of contents that can be related to the trends and diagnostic characteristics concerning the anxiety disorders described in DSM-V (American Psychiatric Association, 2013). Next, a link will be established between the contents of subcategories with negative valence and some of the diagnostic

characteristics for each of the three types of anxiety in question-generalized anxiety, separation anxiety and social anxiety.

In the stories that describe generalized anxiety situations, subcategories Negative Event (A2.2), Exaggerated Investment and Failure (D2.2 4) and Performance Difficulties (G2.2) were composed of contents that are associated with characteristics of generalized anxiety, namely: excessive anxiety and worry (apprehensive expectation) about a number of events or activities; and children's anxiety and worry often concern the quality of their performance or competence at school, in other events or in sporting events which are in line with some diagnostic characteristics (American Psychiatric Association, 2013). Although story 7 (G) did not address school or sport performance, it described a household chore. Children's thoughts in subcategory Performance Difficulties (G2.2) indicate some difficulties while performing a task. The identification of these difficulties along with the contents of Exaggerated Investment and Failure (D2.2 4) suggest that children have negative beliefs about their performance and/or competence, which may contribute to the negative evaluation of situations that require children's participation and involvement. Story 1 (A) presents an event that had a strong association with contents about the Possibility (A2.3) and the effective Physical and Material Damage (A2.4), suggesting a large focus on damage. In the stories that address separation anxiety, subcategories Difficulty with Separation and with the General Situation (B 2.2), Difficulty Accepting the Separation and the Situation (E2.3) and Difficulty with the Separation from the Mother (H2.2) included contents that are related to separation anxiety characteristics, namely an excessive fear or anxiety when the child anticipates or experiences separation from home or from people to whom the child is attached; worry about untoward events, like getting lost; reluctance or refusal to sleep away from home (American Psychiatric Association, 2013). These contents may suggest that children have negative beliefs related to separation from parents or home as they consider the possibility of a permanent separation, and also that the dyad child-parents needs to be constantly reunited to ensure their mutual interest.

It is also important to note that subcategories Possibility of Physical Damage (E2.4) and Physical Damage (E2.5 = 82) have a large number of recording units which are associated with excessive worry about a possible harm to parents, such as illness, injury, disasters, or death as described in DSM-V (American Psychiatric Association, 2013) (e.g.: "I thought that she was feeling bad and could die"; "I thought that that fever would cause her a very serious problem"). These ideas may indicate that along with separation difficulties there are also negative beliefs about loss or damage to the attachment figure which enhance the possibility of permanent separation.

To understand children's separation difficulties, it is not least relevant to analyze the contents related to a possible or an effective abandonment. These contents are less frequent in subcategory Difficulty with Separation and with the General Situation (B 2.2), but it has a considerable number of response units in subcategory Abandonment (H2.3). These contents may indicate that children connect the separation or distance from parents with the possibility of abandonment (e.g. "I thought that she could have gone", "I think that she had already paid and had left me behind"; "I thought that she had abandoned me and had left").

In the three stories that describe social anxiety situations, subcategories Difficulty in the Relationship with Peers (C2.2), Insecurity Regarding the Situation (F2.3) and Difficulty Due to Evaluation and Look from the Others (I 2.2) ) have contents that

correspond to characteristics of social anxiety as described in DSM-V (American Psychiatric Association, 2013). Here are included the overestimation of the negative consequences from social situations; intense fear or anxiety before social situations where children can be scrutinized by others (peers, adults), because children are afraid of being negatively evaluated. The results suggest that children may have negative beliefs about themselves (e.g. "I am not interesting to others") and about the negative evaluation of their skills to interact with others. These beliefs are based on the perception that the others will negatively evaluate their skills. This information highlights the need to consider some important aspects related to social phobia, as described in DSM-IV-TR (American Psychiatric Association, 2000), namely low self-esteem and feelings of inferiority.

### **Contents with positive valence and characteristics of normative development**

The contents of children's positive thoughts were also extracted and give valuable information about the outcomes of children's positive beliefs when dealing with the situations.

Regarding the stories that describe generalized anxiety, the contents that compose subcategory Interest, Involvement and/or Recognition of the Situation (A1.3) suggest that the child may perceive the stimulus as non-threatening, which enhances his/her ability to understand that a certain part of the story happened to other children but not to him/her. The contents included in subcategories Investment (D1.4), Individual Performance (G1.2) and Performance Resorting to Other (G1.3) suggest the existence of positive beliefs about the child's own abilities and performance. Reflection on the Situation (G1.4) points to the child's ability to reflect about an event that is potentially adverse.

In the stories that describe separation anxiety, the subcategory Acceptance of the Separation and of the General Situation (B1.2) is composed of contents that suggest that the child is more independent and has more confidence on his/her relationship with parents. This means that the child is more willing to be away from parents and socialize with friends. The contents of subcategory Recognition of the Situation in (E1.4) show the child's ability to decentralize from his/her own situation and to attend the other's situations. The subcategory Reluctant Acceptance of the Situation (H1.4) again reveals the existence of a mutual trust between the child and the mother. Other contents, specifically those observed in subcategory Acceptance of the Separation (E1.2), refer to verbalizations that show that the child cannot see where the mother is; the contents seem to be associated with the context described in the story and not with any sort of uncertainty of the child about his/her relationship with parents. In this sense, subcategories Deal with the Mother's Absence (H1.2) and Strategies for Resolution of the Situation (H1.3) also suggest a positive view of children about the separation, associated with their ability to handle the situation.

Finally, in the stories that describe social anxiety, subcategory Acceptance of the Relationship with Peers (C1.2) suggests the existence of positive beliefs about the child being accepted by peers and his/her ability to interact with them. They also indicate that the child may feel confident when dealing with others' evaluation about him/her. Contents concerning subcategory Confidence and Interaction with Others (F1.2) suggest that the child is confident on the interest that others have on him/her, and has positive beliefs about his/her ability to connect and interact with them. The contents of subcategory Confidence in the Resolution of the Situation (I1.3) indicate the

existence of positive beliefs about the child's ability to deal with adverse social situations where the child is exposed to other's judgemental or evaluative looks. The child can also interpret the situation by recalling the positive beliefs he or she has about himself/herself and about his/her performance, because he/she attributes the event to the circumstances of the situation and accepts it as a regular event.

The global analysis of thoughts considering all contents (the expression of emotions and the other contents) revealed a higher number of contents with negative valence than contents with positive valence. These results along with the conclusions of Szabó and Lovibond's [42] study and Suarez and Bell-Dolan's [43] work highlight the importance of bias in information processing and its consequent distorted cognitive products (dysfunctional cognitions) as a normal phenomenon in the developmental course of children from this age group [13,28,43,44].

On the other hand, the positive contents found in this study also suggest that children from this age group reach and consolidate important skills for their global development. For example, according to the fourth developmental stage proposed by Erikson [44], the experience of the children who participated in the present study is dominated by the antithesis between industry versus inferiority. In this sense, children's positive thoughts reveal their ability to act near others and with others, and show that the child has realized which tools are valued by others in the external world, i.e. the skills to apply in everyday life, in challenges, tasks and achievements. Thus, the child will feel confident and capable, and the industry prevails upon inferiority.

Children's affective development is also a relevant aspect described by Cole and Cole [45]. According to the authors, children from this age group present emotional bonds that are less dependent from physical proximity, but more settled upon the abstract characteristics of the relationship, such as affection, mutual trust, reciprocal acceptance or approval.

On the other hand, some of the negative thoughts presented by children indicate the existence of developmental aspects that are still not consolidated, which may boost the emergence of dysfunctional cognitions and make the child vulnerable to anxiety.

Unlike the study of dysfunctional cognitions related to ambiguous stimuli that describe anxiety situations, research about cognitions that indicate unbiased information processing (i.e. positive cognitive products) has been focused only on their quantification, aiming at analysing their frequency in children with different levels of anxiety [25-27]. The present work has contributed to surpass the need of more extensive knowledge on positive thoughts pointed out by previous studies [11,16,25], presenting the several contents founds and discussing them in light of the available literature.

Some studies show that children's dysfunctional cognitions about ambiguous stimuli are more related to their incompetence and inability to deal with situations than with potential threats of the stimuli [15,21]. Future studies should consider, besides the analysis of contents related to danger, the analysis of the several contents reported by children about themselves and their beliefs, namely their (in)ability to deal with situations [21]. They should also investigate possible associations between childhood anxiety, self-concept, self-esteem and cognitive characteristics related to stimuli that describe anxiety situations as a whole model, taking the child's perspective into account, considering both the processes and the products, and using the analysis of contents as a strategy to access them. Specific research could



contribute to the knowledge of specific characteristics associated with certain types of anxiety, for example, to analyze the relation between attachment style and the contents of thoughts about separation from parents.

The conduction of further research aiming at studying dysfunctional cognitions and their impact on the anxiety of children from community populations (rather than clinical samples) may be an important contribution to the understanding of childhood anxiety. Confirming the connection between these variables, for example the existence of a positive significant influence of dysfunctional cognitions on children's anxiety would allow the screening of vulnerabilities that worsen anxiety symptoms or anxiety disorders. Becoming aware of the content of those cognitions may provide useful information about the characteristics and negative beliefs associated with children's vulnerabilities and also contribute to the prevention of childhood anxiety disorders.

In this sense, future research should include the analysis of positive thoughts and their impact on the anxiety manifestations in non-clinical samples of children. If a negative significant association is found, it might be possible that positive thoughts are cognitive factors that function as a buffer against anxiety, its onset and maintenance. This may be useful when planning intervention to promote healthy strategies to cope with anxiety.

Finally, we suggest that future investigations on children's cognitive characteristics related to anxiety take into account the presence of expressed emotions in children's thoughts and analyze them. We also suggest that the expression of emotions found in the thoughts of children aged 10-11 years may be an actual characteristic of the cognitive activity associated with the interpretation of ambiguous stimuli related to situations that produce anxiety. Further studies are needed to address this question. Also, the consideration of thoughts as a whole (i.e. with all their several contents) conveyed more accurately the children's internal representations about the situations presented [28,30].

Some limitations should be considered when interpreting the results of this study. First of all, we used a convenience sample, which does not allow the generalization of the obtained results. Moreover, the procedures of this qualitative study have a considerable level of subjectivity that is inherent to the researcher aspects. Finally, possible associations and similarities between the stories and children's life experiences should have been further explored.

The present study provided access to several contents of children's thoughts related to ambiguous stimuli that describe situations related to anxiety. The results suggest the existence of several beliefs and perceptions that underlie the negative and positive thoughts presented by children aged 10-11 years from a normative sample. Information about beliefs and assumptions may be useful to further understand the aspects related to the development and/or maintenance of anxiety in children. The approach of this study, which was based on the child's perspective, opened a field for future research [46,47].

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