YOUNG CHILDREN'S SPONTANEOUS EMOTION VOCABULARY DURING AN EMOTIONAL VALENCE RATING TASK

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Abstract

Emotional vocabulary development represents a growing field of interest. Studies show that children use emotional words starting from the age of two (Izard & Harris, 1995; Michalson & Lewis, 1985). Between 3 and 5 years, children develop their ability to name basic emotions (e.g., joy, sadness, surprise, disgust, anger, fear). Li and Yu (2015) observed that 2–13-years-old Chinese children comprehend positive emotion words earlier than negative and neutral ones. This result is probably link to the fact that *valence* is an early key dimension in emotion conceptual representation (Nook et al., 2017). If many studies investigated emotion words comprehension, only few studies investigated spontaneous vocabulary young children use to refer to emotions in reaction to emotional and non-emotional stimuli. The present experiment measured the use of emotional vocabulary during an emotional valence rating task of words, pictures, words-pictures combined. More precisely, 178 young French children aged 4-, 5- and 6-years-old were observed while rating stimuli. These ratings were made using a three points emotional valence rating scale (negative, neutral, and positive) based on AEJE scale (Largy, 2018). The 90 words, 90 pictures, 90 words-pictures combined were divided in sets of 15 stimuli. Each child rated all sets of stimuli in separate sessions in random order. Children's utterances containing emotion words were recorded. The content form of these emotional words produced was analyzed thanks to EMOVAL software (Leveau, Jhean-Larose & Denhière, 2011). EMOVAL is an automatic evaluation of emotional valence and arousal of texts, sentences using a 5656 root-words meta norm in French and in English. It also extracts emotional semantic topics from texts and sentences. First, analyses highlighted that young children use more positive emotion vocabulary compared to negative one. This result is congruent with the positive bias observed while young children rated emotional valence of stimuli (Syssau & Monnier, 2009). Like comprehension of emotional words, the use of positive emotion vocabulary occurs earlier in the development than negative one. Second, it was found that with increasing of age, the use of emotion vocabulary enhanced. If children aged 4 used topics that refer to primary emotions, children aged 5 and 6 used larger and more complex emotional topics. Discussion focused on the understanding of children's daily emotional language environments, and the implications of these for early educators and teachers.

Keywords: Emotional vocabulary, development, EMOVAL, emotional stimuli, preschooler.

1. Introduction

Emotion word comprehension represent a growing field of interest and has received considerable attention in developmental studies (Baron-Cohen et al., 2010; Ridgeway et al., 1985). Emotional word was regarded as essential in understanding of emotion experience, recognizing emotion stimuli (e.g.: faces, voices) (Izard & Harris, 1995). Most research focused on basic emotion words (e.g., happy, angry, sad, afraid, and disgusted) (Ekman & Friesen, 1971), some on larger range of emotion words including complex and mixed terms (Baron-Cohen et al., 2010; Ridgeway & Waters, 1985). For example, Ridgeway and Waters (1985) used a list of 125 emotion words and revealed developmental changes in children aged 1.5–6 years old. Baron-Cohen et al. (2010) suggested a much wider range of 336 emotion words to underlie developmental trajectories of emotion word comprehension in children. This study showed that during childhood, there are considerable changes in emotion word comprehension. Between 4 and 11 years old, the size of the emotional lexicon doubled every 2 years. This study also allowed emotion terms to be ordered developmentally with respect to their level of difficulty (from basic or common emotions like *happy, afraid* to more complex ones like *touched, bored*). Besides, emotion word comprehension was influence by the valence of the word. Li and Yu (2015) observed that Chinese children (aged 2- to 13-year-old) comprehended earlier and better positive emotion words than negative

and neutral words. In addition, they observed a disadvantage in negative emotion words compared neutral ones with the increase of age. All put together, these studies showed that different emotion category may have developmental trajectories and different sensitive periods.

As early as two years of age, young children can label emotional expressions (Izard & Harris, 1995). This ability keeps developing during childhood (Denham, 1998). Bretherton and Beeghly (1982) interviewed mothers of 2-year-old children about their emotional vocabulary. They observed that over 60% of the children were familiar with the basic emotional terms such as *happy*, *mad,* or *angry.* Besides*,* Children's mother declared that their children were able to use basic emotional terms in their own language. Ridgeway et al. (1985) reported that most of 3-year-old (75%) use emotion words to express feelings, states and preferences (e.g., *good*, *happy*, *surprised, loving, mean, sad, and angry*). Young children are first using emotion words to refer to their own emotional state at about 2-year-old. Then, emotional vocabulary is used with reference to others' feelings, states, and by 3–3.5 years of age, children are using emotion words for characters in reference to story or imaginary ones (Reilly et al., 1990). Grosse et al. (2021) measured the production of emotion words by 4- to 11-year-old children using a vignette test. They found that with increasing of age, children produced more and more emotion words. They also revealed one clear criterion—the differentiation of positive versus negative emotions. Indeed, Nook et al. (2017) showed that *valence* is a crucial dimension for children's emotion representations. First, children develop a mono-dimensional structure only base on emotional valence (negative, positive). Then, they develop a common bi-dimensional representation including *emotional valence (negative, positive) and arousal (calming, exciting)* strating 6- to age 25-year-old. More recently, Sabater et al. (2022) also showed that positive emotion-laden words (e.g., cake, rainbow) are earlier learnt than negative and neutral ones. Additionally, valence of stimuli is known to influence individual's emotion recognition (Eyben et al., 2010), and cognitive processing (Carmona-Perera et al., 2013).

2. Objectives

Given the growing interest in emotional development, there is a small amount of research that deals with the vocabulary children use spontaneously in reaction to verbal and visual stimuli. The purpose of the present study was to examine preschool children's spontaneous use of emotional words uttered during a valence rating task of emotional and non-emotional stimuli. Preschoolers were observed during the valence rating task and their emotion-related utterances were recorded. The content form of these emotion words was analyzed thanks to EMOVAL software (Leveau, Jhean-Larose & Denhière, 2011). EMOVAL is an automatic evaluation of emotional valence and arousal of texts, sentences using a 5656 root-words (nouns, verbs, adjectives, adverbs) meta norm in French and in English. It also extracts emotional semantic topics from texts and sentences. This emotional topic extraction included words that relate to basic emotions (e.g., fear, anger, sadness, etc.), emotion blends (e.g., sorry, embarrassed, etc.), general hedonic tone (e.g., kindness, nerviness, etc.), and words that refer to physiological states (e.g., pain, sleep). Emotional vocabulary is analyzed by two kinds of emotional extraction on EMOVAL. First, we analyzed the emotional valence of children's utterances. Second, we analyzed the emotional topics extract from children's utterances.

3. Methods

3.1. Participants

178 French children participated in the study: 57 four-years-old children (27 girls and 30 boys, mean age: 4-year-old and 6 months, SD=0.33); 60 five-years-old children (28 girls and 32 boys, mean age: 5-year-old and 7 months, SD=0.31) and 61 six-years-old children (31 girls and 30 boys, mean age: 6-year-old and 1 month, SD=0.39). The children were recruited from a variety of school located in Region Centre Val de Loire in France. This area included a broad range of socioeconomic strata. All children were native French speakers.

3.2. Materials

The emotional valence rating test contained a set of 90 words, 90 pictures, and 90 word-pictures combined. These stimuli were divided into three emotional categories (i.e., 30 negative, 30 neutral, and 30 positive for these three conditions). These stimuli are divided into four semantic categories: animal/insects (e.g., rabbit), objects (e.g., fork), food (e.g., cherry) and people (e.g., dentist). Stimuli are only connotative emotion-laden words or pictures (e.g. cake, spider), they relate to emotions without explicitly referring to affective states. Words were selected based on age of acquisition (0- to 4-year-old) defined by Alario and Ferrand (1999), and subjective frequency defined by Bonin et al. (2003). Pictures

were selected from among the emotional databases compiled by Bonin, Méot, Aubert, Malardier, Niedenthal and Capelle-Toczek (2003), Bonin, Peerman, Malardier, Méot and Chalard (2003), and from the identification and denomination norms (3-year-old) developed by Cannard, Bonthoux, Blaye, Scheuner, Schreiber and Trinquart (2006).

3.3. Rating scale

The most widely used emotional valence rating scale in the field is the Self-Assessment Manikin and its updates (SAM; Lang, 1980) based on previous work from the Semantic Differential scale (SDS; Mehrabian & Russel, 1974). This non-verbal tool using drawn characters consisted in a 9-point scale (very unpleasant to very pleasant). For young children, the number of points in the scale must be chosen according to the age and developmental specificities. Following the procedure developed by Syssau and Font (2005), a 3 points scale (i.e., negative, neutral, and positive) was used. To keep the rating task simple for the young children, the 3 points scale were labelled, using drawn faces showing respectively: a sad mouth and eyes, a straight mouth and eyes and a smiling mouth and eyes. Drawn faces were selected from AEJE scale (Largy, 2018). AEJE scale is a French tool adapted specifically to the understanding of young children and non-readers ones.

3.4. Procedure

Words, pictures, word-pictures stimuli sets were divided into 18 sets of 15 stimuli. All 4, 5 and 6-year-old children were divided into two groups according to the modality of stimuli presentation (words only and pictures only *vs.* words and pictures combined). In the first condition: Two kinds of session were administrated. Words only sessions during which words were read by the experimenter and pictures only sessions during which only pictures were presented by the experimenter. In the second condition, words and pictures combined, the experimenter read the word and presented the corresponding picture at the same time. The children were tested individually in a quiet room in their school. Each session lasted approximately 2 minutes. Around two sessions for each child were conducted over a period ranging from 1 hour to 1 day. At the first rating testing session, the experimenter showed the drawn faces and said, "This person is sulking, is unhappy", "This person doesn't care, is indifferent" and "This person is smiling, is happy". Then three practices items were reviewed. Children's utterances containing emotion words were recorded during the task.

4. Results

4.1. How many emotion words do children produce across the 3 age groups?

925 emotional related words were recorded (M=5,19 per child, SD=2,07). 178 utterances were recorded for 4-year-old (M=3,12), 375 utterances for 5-year-old (M=6,25), and 372 for 6-year-old (M=6,09). To test for age effects in the number of emotion words produced, we conducted a one-way-ANOVA with as between-subject factor age and as dependent variable the number of emotion word produced. Results showed that age is a significant factor in the number of emotion words produced. Bonferroni corrected post hoc comparisons showed especially that, the mean number of emotion words differed between 4- and 5-year-old (p <.05) and 4- and 6-year-old (p <.05).

4.2. Which kind of stimuli occurs emotion words in children?

To examine the influence of stimulus' nature: modality (verbal, visual and visuo-verbal) and emotional valence (emotional: positive, negative, and, non-emotional: neutral) on children's emotion words, we used a repeated measures analysis of the variance: a 3 (age) X 3 (modality) X 3 (valence) as within-subject factor and children's number of emotion words as dependent variable. If modality and emotional valence didn't influence significantly the number of emotion words, we observed an interaction effect between modality and valence of the stimulus on the number emotion words [$F_{(4,1)}=4,19$; p.<003]. More precisely, planned comparisons analysis revealed that children produced more emotion words while rating positive words than neutral words [$F_{(1,50)}=4,57$; p.<04]. Planned comparisons also showed that children produced more emotion words when they rated negative words-pictures combined than neutral ones [$F_{(1,50)}=19,59$; p.<000] and positive ones [$F_{(1,50)}=13,74$; p.<003].

4.3. How are emotion words distributing between positive and negative valence?

EMOVAL software evaluates children's emotion words according to their valence. To examine how emotion words are distributed into positive and negative valences, we performed chi-squared analyses. The table 1 summarizes the number and proportion of positive and negative words produced by children.

Table 1. Distribution of spontaneous vocabulary between negative and positive valence.

Age	Positive		Negative		Emotion words	Total words
	No.	%	No.	%		
4-	119	66,85%	59	33,14%	178	231
5-	236	62,93%	139	37,06%	375	520
6-	259	69,62%	113	30,37%	372	498
Total	614	66,37%	311	33,62%	925	1249

Concerning emotional valence differences, chi-squared analyses underlie that children cross the three-age group produced more positive emotion words (614) than negative ones (311) [χ^2 (1) = 66,97, p.<000]. More precisely, at- 4 children produced 119 positive words than 59 negative ones out of 178 [χ^2 (1) = 13,66, p.<000]. At 5-, they produced 236 positive words than 139 negative ones out of 375 [χ^2 (1) = 16,85, p.<000]. Finally, 6-year-old children produced 259 positive words than 113 negative ones out of 372 [χ^2 (1) = 38,87, p.<000].

4.4. Which kind of emotion words do children produce?

To examine how emotion words are distributed into different emotional topics, we used EMOVAL software. The software extracts the emotional topics and their occurrences from children's spontaneous utterances. We found that with increasing age, emotional topics become more differentiated. Children aged 4, produced 5 emotional topics which are love (*e.g., "I love cats"*), good (*e.g., "Honey is so good"),* upset (*e.g., "Once I fell off the bicycle, and it hurts me"*), fear (*e.g., "The spider is big! I'm scary!"*), and aggressiveness (*e.g., "The whip is mean"*). At 5-, children produced 19 emotional topics, then at 6-, they produced 17 of them. For example, children aged 5- and 6-year-old produced emotional topics like softness (*e.g, "The cat is so soft"*), desire (*e.g., "I want the cake! It's so yummy!"*), comfort (*e.g., "Shots are not so bad, they heal"*), irritation (*e.g., "I don't like it when I'm tired because I get cranky"*), terror (*e.g., "Once I had a nightmare, I yelled, daddy!"*), displeasure (*e.g., Bees sting, you must be careful, they have poison"*). Besides, emotion words become more complex into a same emotional topic with age. For example, in the topic aggressiveness, children aged 4 produced two different words which are "*mean*" (méchant) and "*angry"* (colère). At 5- and 6-, they produced six different words into this topic: "*mean*" (méchant), "*angry*" (colère), "*annoying*" (chiant), "*irritating*" (agaçant), "*exasperating*" (soûlant), "*maddening*" (énervant).

5. Discussion

The present study aimed to shed some insight on children's spontaneous emotional vocabulary. First, our results show that there are considerable changes in emotion vocabulary utterances between 4- and 6-year-old: The use of emotional words doubles during this period. In parallel, emotional words become more differentiated (the number of emotional topics increase with age) and more complex (there is a wider range of emotional words into a same topic). These results agree with previous developmental studies on comprehension and production of emotional vocabulary (Baron-Cohen et al., 2010; Grosse et al., 2021). The main finding of this study is the role of emotional valence in the spontaneous emotion words children produced. When children produced vocabulary in reaction to emotion laden stimuli, most of their utterances are positive rather than negative. This finding is in line with evidence showing that children learn words denoting positive feelings, and emotions earlier than negatives ones (Baron-Cohen et al., 2015; Li & Yu, 2015). Our study also highlights that young children produced more positive emotion words in verbal, visual, and visuo-verbal context.

Regarding possible explanations about a positive advantage in emotion word use in children daily life, there are evidence showing that adults mostly use positive words in their interactions with young children (Ponari et al., 2018). For example, out of a corpus of 50 words most frequently addressed to young children, more than half are positive, none are negative (Ponari, 2018). Our results have also an implication regarding the role of language development in emotional understanding, especially in recognizing emotions in themselves and others (Beck et al., 2012). Indeed, emotional words are a starting point of meaning of emotions, emotional experiences, and interactions (Fabes et al., 2001). To conclude, we selected the five high ranking stimuli that occur emotional utterances in our study: cat, spider, cake, bee, horse. We believe that these stimuli can be useful to the educational community. Early childhood educators and teachers face daily challenges about young children's cognitive, social, and emotional needs. Our findings suggest that early educators can foster children's emotional competences by promoting the use of emotional vocabulary during everyday activities.

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