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Emotional experiences at elementary school: Theoretical and pragmatic issues

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1. Introduction

The emotions, for a long time cast out of the scientific field, today represent a very productive and diversified field of research, and research on emotions in the school context is currently experiencing significant developments. The objective of this chapter is to present the main trends of emotion research in the school context. In the first part, we briefly present two significant concepts corresponding to two approaches to the study of affectivity, which can be considered either globally in terms of affects and moods, or in terms of emotions. In the second part, we will see how these concepts are studied in the school context. Lastly, we present a study on the emotional experience of elementary school children before introducing a discussion on the possible continuation of such research.

2. Current approaches of emotions

Several approaches to the study of affectivity are distinguished according to the privileged level of analysis and temporal perspective under consideration. The first approach conceives the affects as durable, overarching phenomena, such as personality and mood, while the second approach concerns emotions, conceived as transitory and fleeting phenomena.

Studies on personality and mood

The aim of research on personality and mood is to identify relatively stable tendencies to feel affects of the same valence (pleasant versus unpleasant). The concepts of positive affectivity (a tendency to feel pleasant affects), negative affectivity (a tendency to feel unpleasant or painful affects), and subjective well-being (a prevalence of positive affectivity) result from this approach (Diener & Lucas, 2000, Tellegen, Watson, & Clark, 1999). Many studies relate the effect of emotional state (e.g., good, bad or neutral mood;

positive or negative affectivity; personality's traits like anxiety) on various aspects of behavior (e.g., problem resolution, social judgment, consumption behaviors, etc). The findings of these studies are complex and, more specifically, they are characterized by an absence of symmetry of the negative and positive affects. Nevertheless, some conclusions can be made. The positive affects mostly have facilitator effects, like the increase of creativity, altruistic behaviors or purchase behaviors (Isen, 2001). In contrast, the negative affects mostly have an inhibitory effect (Isen 1984). Research with children leads to comparable results, although such research is less common. Green and Noice (1988) observe facilitator effects of positive mood in a task of creativity (i.e., problem resolution and a verbal task) with children at approximately nine years of age. Keeman (2002) notes that, in the very young child (i.e., nine months) poorer performance in a task of object search associated with greater negative affect. These works reveal that the emotional state of the child, like the adult, affects performance. However, this work concerns an overarching and diffuse state. Other studies focus on the emotions likely to arise in a given situation.

Emotions

The emotions are mostly described as phenomena of relatively short duration but, sometimes, strong intensity. Emotions alone represent several fields of research that are relatively distinct but also complementary; such as investigations focusing on emotional expressions (face or voice) or emotional experience (subjective feelings). The first group of studies follows Darwin's assumptions concerning the adaptive role of the emotional expressions resulting from evolution. While Ekman's work, which directly addressed Darwin's evolutionary theory, established the universality of the expected interpretation of the emotional expressions, the expression of emotions has also been shown to vary according to context and culture (Keltner & Ekman, 2000). Each culture builds up its own rules of expression, either supporting expressiveness per se or dissimulation according to cases. This situation leads to uncertainty about the links between the internally felt experience of an emotion and the expression made visible to others.

The emotional experience: A complex process

The nature of emotional experience has given rise to many studies (Frijda, 1987). Nevertheless, there is currently a strong consensus concerning se-

veral significant properties of the emotions. One characteristic of emotion is the simultaneous association of a physical feeling (e.g., modification of the heart rhythm, muscular tonus, sudation etc), mental representations (e.g. the subjective psychological experience of an emotion such as happy, sad, angry, scared, surprised, disgust, etc.), and a specific behavioral answer (e.g. escape, attack, smile, scream, etc.). Despite the fact that the importance attached to each of these aspects of emotional experience and assumptions about their place in the course of such experience vary according to author, emotions are usually conceived in dynamic terms. They are not reduced to isolated phenomena, instead being connected with complex processes that integrate a multiplicity of components (particularly cognitive) and generate other processes. Frijda (1987) proposes the emotional processes should be represented in term of sequences of the treatment of information, where several sequences are focused on the detection of the relevance and the hedonic valence of the situation, and the individual's possible adjustments to face it. The emotion defines itself, according to Frijda, as an analysis by the individual of the event's valence (pleasant-unpleasant), an interaction between this valence and the potential (or actual) consequences, and as the modification of the preparation state for action. This complex expression indicates the nature of the relation between the individual and his environment at the current time: does he wish to maintain or intensify his experience, to withdraw himself from or stop the situation, or to modify the type of transaction by developing, for example, agonistic behaviors (behaviors of opposition or aggressiveness)? The modification of the preparation state for action derives quantitatively from an activation (i.e., physiological awakening), and qualitatively from a particular action tendency (i.e., behavior orientation). This action readiness tendency can then manifest, or not, into obvious behavioral answers, which might be observable (e.g., facial expressions, escape behavior, burst of laughter, etc) or discrete cognitive responses (e.g., thoughts, recollections, representations).

According to Scherer (1984, 1992), the evaluations of the various aspects of an emotional situation would successively be developed in the following invariable order: novelty, intrinsic valence, meaning with regard to the goals and needs of the individual, possibility of facing (coping) and compatibility with the cultural and internal standards (concept of oneself). This sequence, which is constantly operative and therefore very rapid, is likely to be expressed in the increasingly significant muscular activation of the face that

progresses with the evaluation of dimensions of the situation. In this way, for example, a new stimulus involves an opening of the eyes, then a closing of the face if it is evaluated as unpleasant, a contraction of the face if it is in contradiction with the individual's goals, and so on.

Theories such as Frijda's and Scherer's underline the dynamic character of the emotion and the role of the evaluation of the situation for the individual. Such theories to some extent concern a modeling of subjectivity.

The development of the emotions: Intricacy of cognitive, emotional and social factors

The literature on emotions in childhood suggests a development related to cognitive and emotional factors. This literature underlines the socialized character of the emotions and the active contribution of the environment. Two significant findings emerge from research. On the one hand, a great disparity between preschool children in their level of emotion comprehension level is observed (i.e., individual differences) and, on the other hand, there is a progressive development of children's competence in understanding emotion. Individual differences in emotion comprehension are observable very early. Dunn, Brown and Beardsall (1991) showed that, from three years of age, the number of words referring to emotion varies profoundly between children, ranging from 25 references per hour to none. Further, Pons and Harris (2005) established that these individual differences observed early in the childhood remain marked in spite of school attendance. In fact, various empirical contributions show that individual differences in emotion understanding are relatively stable between three and 12 years of age. Research has not yet clarified the factors that explain these differences but various factors appear to be of importance: specific characteristics of the child, such as linguistic competence, and social and family characteristics.

Furthermore, it appears that the understanding of emotions is built around several components with increasing level of complexity. The child acquires them progressively during his development and there is evidence to suggest that there are nine components of emotion understanding organized in three groups (Pons & Harris, 2005). The first group gathers simple components calling upon external dimensions of emotions. The task facing the child is to recognize basic emotions from facial expression and to understand the causal role of situations and memories in the emergence of emotions. Smiley and Huttenlocher (1989) showed that, from two years of age, when one

presents children with two images, they can discriminate expressions of joy from other emotions. Similarly, from four years of age, children acquire a lexicon to describe emotions expressed on a face. However, Thommen, Châtelain and Rimbert (2004) moderate these findings, underlining the observation that the spontaneous use of verbal emotional description remains rare up to eight years of age. Further, Wellman, Harris, Banerjee and Sinclair (1995) indicate that from three years of age children integrate the idea that no situation is a priori pleasant or unpleasant, but that the emotional reaction of an individual depends on the adequacy of the fit between his goals and the actual situation. Nevertheless, despite the fact that young children do show some awareness of subjectivity and mental life, this early period of emotion comprehension is marked by a focus on the ostensive manifestations of emotional experience.

The second group of emotion components relates to mental aspects of the emotions. It concerns understanding false beliefs and the role of (conflicting) desires in the emergence of the emotions, as well as the ability to distinguish expressed emotions from those that are felt. Wellman et al. (1995) show that from about five or six years of age children gradually represent to themselves the factors likely to influence the emotional experiment. Thus, the child starts to consider the beliefs of individuals as part of their formulation of an emotional response. Finally the third group of components combines emotion dimensions which call upon a setting in perspective. For the child, it is a question of recognizing the existence of mixed emotions, to understand that it is possible to control emotional states and, finally, to conceive of the moral emotions. The acquisition of these components occurs between seven and 12 years of age.

The findings outlined above therefore aim to show that emotional competences develop gradually during childhood, that they result from an understanding based on the situations, as well as the intentions, expectations and beliefs of the individual. This framework suggests the development of specific cognitive-emotional competences, which are in their turn likely to influence the cognitive and social development of the child. The psychology of the emotions in the realm of education largely refers to these approaches. Thus, in the following section, we present some examples of studies on the emotions conceived in term of such processes.

3. Emotions at school

School constitutes a favorable environment to study emotions both in terms of qualias and intensity. Two research traditions may be identified: the first is centered on wellbeing and the second on emotions.

An approach centered on wellbeing

Research on the well-being of the pupil explores the well documented construct of subjective well-being for the adult (Diener & Lucas, 2000). Subjective well-being is organized around three criteria: high positive affectivity, weak negative affectivity and perceived quality of life. Well-being is a crucial construct, not merely from perspective of the assumption of responsibility for depressive disorders in adolescence, for example, but also from the point of view of prevention (Huebner, Shannon & Smith, 2004). Taking the mid-teenage period as their starting point, Huebner and McCullough (2001) studied relations between the perceived quality of life at school, positive and negative daily events, major life events (both positive and negative), and the feeling of self-efficiency. Amongst 15-year-olds, results showed that school satisfaction was not only related to the existence of pleasant events (daily and major) but also to the feeling of auto-effectiveness. A more focused analysis exploring the causal direction of these relations showed that the environmental variables better predicted school satisfaction than did the feeling of auto-effectiveness. In this study, however, the events of life only marginally concerned school life. By contrast, in a major national study involving nearly 100,000 Finnish pupils between 14 and 16 years of age, Konu, Lintonen and Ville (2002) directly explored the contribution of school in the subjective wellbeing of pupils. Despite significant variability between pupils, this study revealed a strong effect for school. According to the authors, the effect of school can be explained by the existence of impressive homogeneity within Finnish schools, which affect pupils' wellbeing in a relatively uniform manner.

Opdenakker and Van Damme (2000) have also attempt to clarify the relation between the pupils' well-being and the school setting. This study falls under a longitudinal seven-year program initiated in 1997 and was designed to evaluate the impact of school in several learning domains. They assessed the well-being of pupils on eight dimensions: total well-being at school, social integration in class, interest for learning activities, motivation to learn, attitude displayed regarding work at home, attention in class, and school self-esteem.

These pupil data were then connected with the characteristics of schools (teaching practices, teaching staff co-operation in relation to teaching methods and pupil counseling, attention to pupil differences and development, orderly learning environment). Two significant insights emerged from this study. On one hand, the effect of the school proves to be more significant for pupil academic performance (mathematics and mother language) than wellbeing. On the other hand, this effect on well-being seems to be mediated by the co-operation between teachers variable. The authors also note an interaction between two other variables; pupils' initial motivation (assessed at time of entry to secondary school) and orderly learning environment. The learning organization is beneficial in terms of well-being only for the strongly motivated pupils. In contrast, it is unfavorable to the well-being of poorly motivated pupils. In sum, these findings suggest that the pupils' point of view—their expectations for themselves as pupils as well as their feeling of being able to address themselves to the demands of the school—affects their sense of wellbeing.

Engels, Aelterman, Van Petegem and Schepens (2004) also investigated significant aspects of pupil's life circumstances and environment that contribute to wellbeing. This research addresses a Flemish government request that considers how the wellbeing of pupils functions as an indicator of the operation of schools and classes. The purpose of this study was to evaluate wellbeing state (which presumably related to a local context) and to identify dimensions of school life that according to the pupils themselves contribute to wellbeing. To address these issues, the authors prepared a questionnaire, the structure of which was evaluated with a sample of 2054 pupils (from 26 schools across all six years of secondary education). Their findings showed that total wellbeing scores are strongly determined by the perception and the satisfaction of the pupils with respect to the level of the class and the school. These significant poles of satisfaction related to school building (e.g., architecture, maintenance), atmosphere, friendship network, degree of participation in the class, active working methods, and diversification of the media. The wellbeing thus results from the integration of judgments on multiple facets of the school environment, but the question of the direction of causal relations remains open.

In a further study of well-being in high school, Gumora and Arsenio (2002) explored relations between emotional regulation, emotionality, affects relating to school and academic performance in pupils between the sixth and

eighth grade; from 11 to 14 years of age. School performance was evaluated using a total index of Mathematics and English, and standardized tests of knowledge. Pupils also answered a questionnaire concerning their feeling of school competence (Academic Competency Scale). Affects were identified on the basis of (i) self-evaluation of negative affectivity relating to the school (Negative Academic Affect Scale), (ii) global negative affectivity (Self-Reported Negative Mood), (iii) emotional regulation (Emotion Regulation scale), and (iv) teacher evaluation of pupil affect (Positive Affect and Negative Affect Scale). This study revealed very interesting relations between negative affectivity towards school (NAAS), global negative affectivity (Negative Mood), feelings of competence and academic performance. While global academic performance was correlated with teacher evaluations of pupil affect ($r = .36$ for positive affectivity, $p < .001$), there was a stronger connection between the feeling of academic competence and the two measurements of negative affectivity from the pupil ($r = -.51$ for negative affectivity towards school and $-.44$ with global negative affectivity). Emotional regulation was weakly correlated ($r = .17$) with academic performance (tests of knowledge), but more robustly correlated with feelings of competence ($r = .28$) and negative affectivity towards school ($r = -.23$). This pattern of correlations evokes an intricate picture of the pupil's emotional experience, feelings of competence and learning. It is our view that this intricate picture needs further scrutiny because of the connections between the tendency to feel negative affects, negative affectivity towards school and school performance. Such findings raise the question of the contribution of emotional experience in the development of the feeling of both emotional and academic competence.

Emotions and learning at school

A major analysis of the literature between 1974 and 2000 concerning emotions and learning shows that studies have primarily investigated anxiety (Pekrun, Goetz & Titz, 2002). However conversations with secondary school and younger students reveal a diverse repertoire of emotions are evoked in connection with schooling, with the exception of disgust. Pekrun et al. (2002) propose the expression academic emotions to delineate emotions directly related to school activities, learning and knowledge, and success (classroom instruction). These authors devised the Academic Emotions Questionnaire (AEQ) to study relations between academic emotions and various aspects of school behaviors, such as performance, adjustment, and coping strategies.

The AEQ includes three sub-scales according to context: learning, work in class, and evaluation. On the basis of AEQ responses by university students, three clusters were formed according to the antecedents of the emotion: (1) Joy, hope and pride were the result of positive events; (2) Anxiety, shame and despair followed negative events associated with a feeling of lack of control and anger, and boredom followed unpleasant events associated with a feeling of high control; (3) Relief alone constituted a cluster by itself, and was defined as occurring at the end of an unpleasant event that has ceased. Importantly, these emotional experiences varied as a function of pedagogical domain and Goetz, Zirngibl, Pekrun and Hall (2003) observed null to very modest correlations between emotions assessed during English lesson (foreign language), German lesson (mother language), music, mathematics, and sport.

That emotions depend on context is hardly surprising if one considers current models of emotion that have been formulated in terms of treatment of information. The emotional process is organized around valence and the importance of the situation for the individual (Frijda, 1987; Scherer, 1984; Lazarus, 1993), and it is important to appreciate the emotional experience in situ. Within such a perspective, Laukenmann, Bleicher, Fub, Gläzer-Ziduka, Mayring and von Rhoeneck (2003) conducted a study integrating both qualitative and quantitative steps. The authors asked 8th grade pupils between 13 and 15 years of age to answer open questions about a lesson (20 sessions) on electricity using a diary, and to participate in semi-structured interviews. Four sets of themes resulted from the qualitative analysis of the answers: interest, boredom, pleasure, and anxiety. In addition, several variables were located with questionnaires: School satisfaction, well-being, anxiety with regard to physics, interest and feeling of competence with regard to the domain (electricity), as well as preliminary knowledge in physics. Positive correlations emerged between performance at the end of the sessions and feeling of competence, interest and well-being. On the other hand, negative correlations also appeared between performance, boredom and anxiety. The strongest relations related to preliminary knowledge and final performance. Because quantitative data analysis was supplemented with the qualitative approach deriving from the diary reports and interviews, it was possible to locate a complex pattern of influence on pupil anxiety. Anxiety features, which showed trans-situational stability, were likely to play an inhibiting role, while state anxiety related to the current situation and was behaviorally mobilizing. Moreover, successful pupils were more clear-sighted about the distinction

between fear of failure (an anxiety feature) and being afraid of failure in a learning situation (a reflection of the pressure to succeed and state anxiety). Pupils experiencing difficulties were likely to inhibit their responses related to the pressure to succeed, and thus appeared less anxious in situ but had a more significant level of latent anxiety.

Understanding pupils' perspectives on their own emotional experience has also been the focus of research by Järvenoga and Järvela (2005). These authors have sought to discern the attributions pupils make about the causes of their own emotions while they are learning in interaction and also using the computer-supported collaborative learning projects (TICE). Their research question is formulated in terms of two (presumably) interdependent concepts, emotions and volition, or volitional processes (i.e., behavior regulation according to a goal). Within this framework, they postulate that emotions may affect learning processes in the motivational phase (construction of the goal) as well as in the volitional phase (realization of the goal). Like Laukenmann and al. (2003), the authors privilege a qualitative approach based on interviews of pupils between 12 and 15 years of age engaging in project work. The interviews were centered on the following topics: descriptions of the personal goals, learning strategies, interpretations of the work environment, and beliefs and feelings about oneself. From these topics, five categories relating to the emotions were drawn. They related to oneself (37% of children), the context (32% of children), the task (12% of children), performance (8% of children), and the interaction (8% of children). The category oneself included descriptions of the students' experiences and endeavors, their personal interest and global thoughts about the situation; in particular, their feelings of being able to face the situation and their personal motivations. The context category gathered all the remarks on the work environment. According to the authors, the oneself category was one of the most represented but occurred at the beginning of the activity when the goals were not yet well established. In sum, while the attributions young adolescents make about their emotions in learning situations are diverse and complex, relatively few connect their emotions to the learning goals of specific situations. Instead, they largely focus on their personal resources and experiences, or external factors of the learning environment.

4. Emotions at elementary school

Traditionally, studies of academic emotions have been carried out with secondary school pupils or university students (e.g., Gläser-Zikuda & Mayring, 2003; Pekrun et al., 2000; Järvenoja & Järvelä, 2005). Consequently, the experience of elementary school pupils is poorly understood. Identifying and understanding the role of emotions in school learning from the elementary period is all the more significant because of the potentially long term impact of young children's emotional experiences. In the short term, understanding the emotional experiences of elementary school-aged children is important for better identifying the role of the emotions in school performance (e.g., results, problem solving strategies, etc). With these concerns in mind, we conducted two studies. The first explores characteristics of the emotional experience of 10-year-old children in relation to various work contexts. Children were invited to describe their emotions during work sessions in the classroom, group activities, homework, and also during examinations. The second study aims to identify links between emotional experience, preferences for specific educational subjects, and academic performance in children between eight and 11 years of age.

Study 1. Emotional experience at the elementary school

This study assessed whether children make clear discriminations between emotions in situations that concern their own experiences. Our assessment of what children themselves feel (WCTF) was based on children's evaluations of various important situations. We reasoned that, even if these evaluations occur in a perfectly intimate and personal setting, one will find invariants in the manifestations of various emotions because they impact the child both physically and intellectually, and they color the agreeability of a given situation. We asked 52 children in CM2 ($M_{age} = 10;2$, $SD = 6$ months) to think about emotions they experience in (1) the classroom, (2) during school tests, or (3) during homework. Children were questioned about various aspects of their emotions: agreeability, frequency, and the physiological manifestations and thoughts that accompany them.

Children were questioned on twelve emotions: anger, anxiety, sadness, despair, fear, shame, boredom, pride, relief, surprise, joy and satisfaction. The first seven were regarded as negative valence emotions, and the remaining five were regarded as positive valence emotions.

Each child was provided with envelopes containing a questionnaire that

referred to an experienced emotion (WCTF) in a given situation. Each of the 12 emotions was set in each of the three contexts (classroom, school tests, homework), resulting in 36 combinations, and envelope types. Each child only worked on 18 envelopes, however, so that intellectual tiredness would not affect the quality of their answers; particularly given the intense focus on introspection. Thus two groups of children ($n_1 = 25$ and $n_2 = 27$) took part in this study. Following a drawing of lots that determined group, each envelope was selected randomly and the child was asked to answer the small questionnaire.

Frequency of the emotion experienced according to contexts.

We compared the frequencies of WCTF (measured on a 1-5 scale) in the three contexts. Frequency of emotion X Context differences were examined using a Student t-test. If we first consider differences between the school context (in the classroom or during tests) and home, results showed that fear, despair, anxiety, sadness, boredom and joy were more commonly felt at school, whereas anger and shame were more commonly felt at home, and there were no differences for satisfaction, relief and surprise. Within the school context, emotions related to apprehension (i.e., anxiety) characterized tests, whereas sadness, boredom and joy were more commonly felt in the classroom. Further, in the classroom emotions were more diversified. Leaving aside joy, these emotions (sadness, despair, boredom, and fear) suggest a general feeling of impotence that could have a direct impact on learning, while joy could be related to social contexts (e.g., interactions with peers). The more frequent experience of negative emotions at home may reflect the possibility of letting affects such as anger being expressed. The relatively high level of shame in homework contexts requires further investigations on the nature of this emotion for children. In sum, the results show that the emotions vary in meaningful ways according to context.

The relation between emotional valence and context

Children were also asked to judge the agreeableness (pleasant—unpleasant) of the emotions experienced according to context. This approach was adopted so that we could find out not just what children felt, but how strongly WCTF is moderated by context. For example, is the experience of joy as pleasant during homework as it is in the classroom? Adopting the same

approach outlined above, if we first consider differences between the school context and home, results showed that anger, boredom, relief, pride, surprise and joy were experienced as more pleasant, or less unpleasant, in the school context, whereas despair, fear, shame and anxiety were experienced as less unpleasant at home, and there were no differences for satisfaction. Within the school context, pride was experienced as more pleasant in the classroom, while anger, boredom and relief were experienced as more unpleasant in the context of a test. Therefore, it seems that negative emotions are not only identified as more frequent but also more painful at school.

Moreover, the emotions considered to be more pleasant or less unpleasant at school are diverse since they relate as much to anger and boredom as to relief, pride, surprise and joy; covering both positive and negative emotions registers. Concerning different contexts within school, the fact that the children consider anger to be less unpleasant in a testing context appears to be compatible with the fact that anger has a high level of activation and, thus, represents a possible means of facing difficult situations. Further, the fact that boredom and anger are both considered less unpleasant during testing situations confirms the ambiguity already raised by Pekrun et al. (2002): Boredom should reflect a difference between actual competence and the target learning outcomes. When this deviation is strong, boredom is likely to fit with a failed avoidance strategy. When the deviation is weak, it is likely to result from the feelings of uselessness about the learning task.

In sum, children differentiated their emotions in terms of frequency and agreeability according to context. Along with the dynamic conceptions described earlier, this initial analysis shows that the emotional experiences of children fall under the individual-situation interaction. The following section presents a fine-grained examination of the content of children's emotional experience of academic emotions, taking into account variations in context.

The content of emotional experiences

The content of the emotional experiences described by children were evaluated with respect to the constellation of responses expected within the cognitive approach framework of emotion. Children were invited to express on their experiences (WCTF) in term of thoughts and action tendencies (e.g., a desire for doing something or not), on the one hand, and in terms of bio-behavioral manifestations (vegetative-nervous system activation, tonus, etc), on the other hand. These are described in more detail below.

WCTE We initially examined variations between positive and negative emotions as described above. For this analysis, we grouped items into three categories according to whether they related to oneself, others or to the interaction between oneself and others or the environment. Of course, sharper distinctions exist inside each category. For clarity, however, we only refer to these categories or items when we think it contributes substantively to understanding.

Table 1 provides an overall representation of the characteristics of the emotional experience described by children. Positive emotions were characterized by an outward orientation to the world, and a pleasant emotion experience. Negative emotions present a strongly contrasting profile, characterized by painful emotional experience, a tendency to withdrawal, mixed with an agonistic, confrontational tendency. A significant element observed for the negative emotions is the need for support, which exists over and above the social sharing tendency.

Table 1. Sub-categories of items more significantly associated with different emotion valence in children's self report (examples and emotions in parentheses)

Categories	Emotion valence	
	Positive	Negative
Oneself	Positive thoughts about oneself (e.g., "I see everything in pink": <i>joy and relief</i>)	Negative thoughts about oneself (e.g., "I have black thoughts and am no one": <i>sadness, anxiety and anger</i>); Unpleasant affect externalization (e.g., "I feel like shouting/crying": <i>anger, anxiety, sadness and shame</i>); Perturbation of psychological activity (e.g., "I can hardly think of anything else and I don't know what to do": <i>sadness, anxiety and anger</i>)
Others	Positive thoughts about others (e.g., "I like everybody": <i>joy and relief</i>)	Negative thoughts about others (e.g., "I like nobody": <i>anger</i>)
Interaction with others or environment	Tendency to approach of others: Social sharing tendency (e.g., "I want everyone to be aware of it": <i>pride</i>); Externalization tendency (e.g., "I feel like hopping": <i>satisfaction, pride and joy</i>)	Tendency to withdrawal: Need for support (e.g., "I don't feel like speaking with the others": <i>sadness and anger</i>); Tendency for agonistic behaviors (e.g., "I feel like getting angry": <i>anger and anxiety</i>)

Differences according to context were more salient for negative emotions. Thus, in the classroom context, for example, children's emotional experience is organized around, (i) negative thoughts with regard to others (but not towards oneself), (ii) withdrawal tendencies (e.g., "I don't want to speak with the others"; "I feel like falling through the floor", and "I feel like hiding myself"), (iii) agonistic behaviors (e.g., "I want to shout at the teacher") and the externalization of painful affect (e.g., "I feel like crying").

Bio-behavioral manifestations. Children's self-reported bio-behavioral manifestations of emotion were categorized using the same principle as the emotion experiences (WCTF). We found the following categories: tonus/posture, neuro-vegetative arousal (e.g., sedation, feelings of heat/cold), agonistic behaviors (e.g., fights, insults), interruption (e.g., thinking, acting difficulties), externalization (e.g., tears, laughing), withdrawal (e.g., sulking, hiding). Manifestations of bio-behavioral consequences associated more strongly with different emotional valences are summarized in Table 2; those characteristics that were significantly more frequent for a given emotion valence, using Chi-squared analyses, are only listed under that valence. Those manifestations appearing independently of valence belong to the tonus/posture category and refer to arousal. Table 2 shows that children's self-reported bio-behavioral manifestations of emotion are consistent with their valences. The unbidden, involuntary character of negative emotions, already documented with emotion experiences (WCTF), also comes through in this analysis.

Table 2. Sub-categories of bio-behavioural items associated with positive and negative valence emotions

Categories	Emotion valence	
	Positive	Negative
Tonus/posture	I don't stay still; I gesticulate; I am excited; I am agitated <i>(Those items above are present for both positive and negative)</i>	
	I feel cool; I feel relaxed; I am laughing; I breathe a deep breath	I am shaking all over; I feel like a marshmallow; I don't have much energy; I am a little shaking; I feel tense; I feel nervous

Neuro-vegetative activation	--	I am yawning; I feel nausea; I feel warm; I can feel my heart beating
Agonistic behaviors	--	I insult my buddies; I am brawling
Interruption	--	I feel paralyzed; I can hardly think I say anything; I can hardly do things; I cannot control myself; I am loosing my skills
Externalization	--	I am crying; I use coarse words
Withdrawal	--	I am sulking

Summary

These initial analyses show that children are sensitive to the different emotions that arise from closely related academic contexts; they are also sensitive to the variation of intensity in such emotions as a function of context. Further, even at ten years of age, children are clearly able to describe the thoughts and actions that result from positive and negative emotional experiences, and the associated changes in bodily responding. Finally, the descriptions offered by children, whether concerning positive or negative valence emotions, and resulting from contexts that are very similar (all centering on academic emotions), show an impressive level of emotional sophistication. Of course, we could go further and conduct analyses for each emotion specifically but this is beyond the scope of the current discussion. Suffice to say, Study 1 clarifies the content of emotional experiences in children according to emotion valence and context, as revealed by child self-report. The findings show that children make sharp discriminations between their emotional experiences, which are also moderated according to context. The results lead us to think that, at this age, children are very able to discriminate their emotion responses when they are asked to discuss which emotions they feel in various contexts. In the following study, therefore, we examine the wider implications for children's academic emotions in the school context.

Study 2. Emotions in school contexts: Relations with well-being and performance

The objective of this study was to examine relations between academic emotions (see Study 1), academic performance and preference for specific subjects (i.e., Mathematics and French), and children's overall affectivity (positive versus negative affect and emotional control).

Procedure

The study was carried out in an elementary school of the Parisian suburbs, receiving children with a diverse range of backgrounds. Four school levels were assessed, CE1 (2nd grade) through CM2 (5th grade). The sample comprised 122 children, although not all were available for all measures. In the ensuing analyses, because of the distribution of children in the four grades, we sometimes compare 2nd grade children with 3rd through 5th grade children. We have indicated when such an approach has been adopted.

Children were asked to answer a questionnaire on their life at school including items intended to measure their preference for Mathematics and French. They were then asked to answer a questionnaire evaluating their overall affectivity – positive versus negative affect, and emotional control – which was an adaptation of Walden, Harris and Catron's (2003) How I Feel (HIF) scale.

To evaluate academic performance, two books of activities were given to the students, one for Mathematics and one for French. The items in these activity books were extracted from a bank of items provided by the National Evaluations of Competence targeted at the end of French cycle 2 (CE1) and cycle 3 (up to CM2). Once each book was finished, children answered a questionnaire concerning their emotional experiences (academic emotions) in the respective domain. One session was dedicated to Mathematics activities and another to French activities. Each session lasted approximately one hour. It is important to note that the standardized test measures for CE1 (2nd grade) were different and could not be directly compared with CE2-CM2 (3rd to 5th grade). We present the data here in a synthetic way, omitting analyses that were not of theoretical or practical interest.

Positive versus negative affect, emotional control, academic performance and preference for educational subjects (Mathematics and French)

Below, we briefly summarize children's performance in each domain before considering cross-domain relations.

HIF: Positive versus negative affect and emotional control. After carrying out the necessary analyses to check that the psychometric qualities of the French version were compatible with the American version, which they were, we examined the distribution of scores on each of the scales by class. The scores on the positive affect scale were stable, $F_{(3,115)} = 2.01$, ns, suggesting positive affect was equally likely in each grade. In contrast, there was a considerable and significant reduction in average scores for negative affect scale, $F_{(3,117)} = 5.95$, $p < .001$, as well as the control scale, $F_{(3,112)} = 3.08$, $p < .05$.

Academic performance: Examination of the pupils' results on the Mathematics and French tests showed a broad range of distributions, with significant mean increase by grade (between 3rd and 5th) for Mathematics, $F_{(2,87)} = 27.88$, $p < .001$, and French, $F_{(2,66)} = 6.93$, $p < .001$. This difference was particularly marked between CE2 (3rd grade) and CM1 (4th grade). Children's results are summarized in Table 3.

Table 3. Academic performance (mean and standard deviation) in Mathematics and French using standardized school tests

Classroom	French (mother language)			Mathematics		
	Mean	SD	Maximum	Mean	SD	Maximum
CE1 (2 nd grade)	55.5	18.00	/112	56.6	20.26	/112
CE2 (3 rd grade)	33.2	14.7	/124	25.6	15.45	/168
CM1(4 th grade)	43.8	17.45	/124	53.0	26.87	/168
CM2 (5 th grade)	52.3	14.90	/124	76.1	27.97	/168

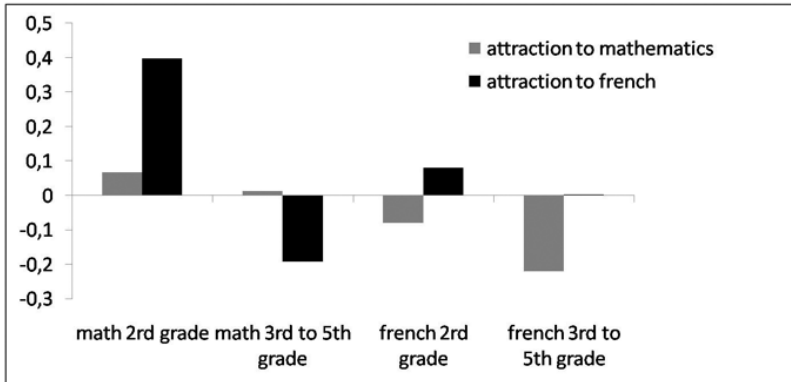
Preference for academic subjects: With regard to children's preferences for these two subjects, analysis of mean scores showed that a preference for Mathematics was stable across the four classes. For French, however, children's ratings of preference start to reduce from CM1, though it should be noted that the effect was only marginally significant, $F_{(3,118)} = 2.28$, $p = .08$.

Relations between academic competence and preference, and emotional variables (affectivity and academic emotions)

Academic preference and competence. Examination of relations between preference and performance revealed cross-domain relations: The preference

for French is correlated with the success in Mathematics for 3rd to 5th grade children, whereas a stronger preference for Mathematics tends to be negatively correlated with performance in French. This relation is depicted in Figure 1.

Figure 1. Correlations between academic preferences (attraction) and performance according to the subject (Mathematics and French) and grade (2nd versus 3rd, 4th and 5th grade)



Academic preference and academic emotions. Relations between children’s academic preferences and their academic emotions are shown in Table 4, which shows positive and negative correlations between preference and emotion separately for French and Mathematics. Table 4 shows that children’s preferences for French were positively, but moderately, associated with positive emotions felt during French activities. In contrast, two negative emotions (anger and boredom) were negatively associated with children’s preferences for French: Thus, the more children experience boredom and anger, the lower their preference for French. Or, conversely, the lower their preference for French, the more they experienced boredom and anger.

Table 4. Correlations between children’s academic preferences and academic emotions relating to French and in Mathematics

French		Mathematics
Positive correlations	Negative correlations	Negative correlations
Pride		
Frequency : .339		
Intensity : .390	--	--

Duration: .246 <i>Agreeability</i> : .368		
Relief		
Frequency: .301 Duration: .234	--	<i>Agreeability</i> : -.201
Hope		
Frequency: .260 Intensity: .262 Duration: .220 <i>Agreeability</i> : .357	--	--
Joy		
Frequency: .339 Intensity: .376 Duration: .351 <i>Agreeability</i> : .245	--	--
Surprise		
<i>Agreeability</i> : .235	Frequency: -.201	<i>Agreeability</i> : -.254
Fear		
<i>Agreeability</i> : .220	--	--
Anger		
--	Frequency: -.248	Frequency: -.170 Intensity: -.233
Boredom		
Frequency: -.239 Intensity: -.233	--	--
Sadness		
--	--	Frequency: -.177
Shame		
--	--	Duration: -.179

The pattern of associations differs in the case of Mathematics. Whereas no connection appears between positive emotions and preference for Mathematics, one notes more correlations, also moderate, with negative emotions. Thus, lower levels of anger, sadness and shame tend to be experienced or felt (both in terms of frequency or intensity) when the preference for Mathematics is high.

Academic competence and affectivity (HIF). Relations between children's affectivity (HIF) sub-scales and academic competence are presented in Table 5. No connection appears between positive affect (i.e., well-being) and academic competence. However, the negative affect scale is negatively associated with performance in French and, for the 3rd to the 5th grade pupils,

with performance in Mathematics. Thus, children whose results are weak tend to have higher levels of negative affect scores. This connection is particularly marked in the 2nd grade.

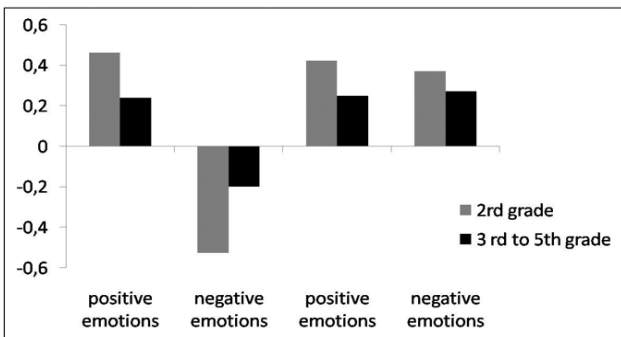
Table 5. Correlations between children's affectivity (HIF) and academic performance in Mathematics and French

Subject	Positive emotion		Negative emotion		Emotional control	
	Cycle 2	Cycle 3	Cycle 2	Cycle 3	Cycle 2	Cycle 3
	Grade 2	Grades 3-5	Grade 2	Grades 3-5	Grade 2	Grades 3-5
French	.085	.107	-.513**	-.210 ^a	-.022	-.270*
Mathematics	-.278	-.222	-.266	-.233*	-.046	-.052

^a $p < .10$, * $p < .05$, ** $p < .01$

Academic competence and academic emotions. Finally, we analyzed relation between academic emotions and performance in both Mathematics and French. For simplicity, as in Study 1, academic emotions were first considered merely positive or negative. As can be seen in Figure 2, these relations are rather specific to each subject. In Mathematics, depicted in the left hand side of the figure, positive emotions (pride, relief, joy and hope) vary in the same direction as performance. In contrast, negative emotions (sadness, anger, anxiety and boredom) are conversely connected with success. This phenomenon is observed for all the grades. In French, the frequency of emotions experiences, whether positive or negative, is related to academic performance.

Figure 2. Mean correlations between performance in Mathematics (left hand side) and French (right hand side) and the frequency of positive and negative academic emotions in 2nd and the 3rd to 5th grade pupils



Regarding links between poor performance and emotion, a more refined analysis by specific emotions is warranted. Whereas Figure 3 shows, in keeping with Figure 2, that higher levels of sadness and anger are linked with performance in Mathematics and French in contradictory ways, Figure 4 shows that anxiety is associated with poor performance in both subject areas and at both educational levels. From a motivational point of view, it seems that the emotional experience yielding the highest performances in French, anger and sadness, are relatively unpleasant, but the opposite is true for mathematics. By contrast, anxiety, whatever the context, seems to have a negative impact on children's performance.

Figure 3. Correlations between academic performance and negative emotions (sadness and anger) according to subject task and grade

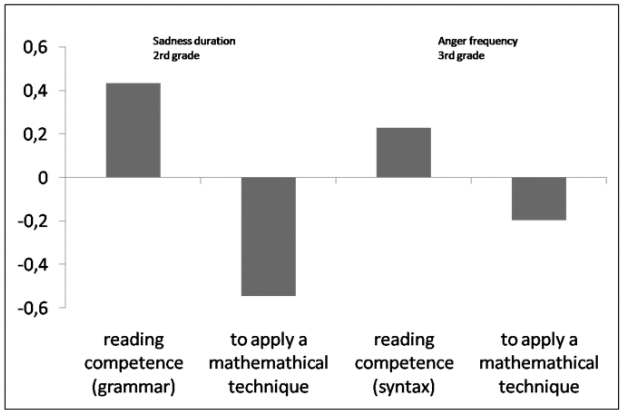
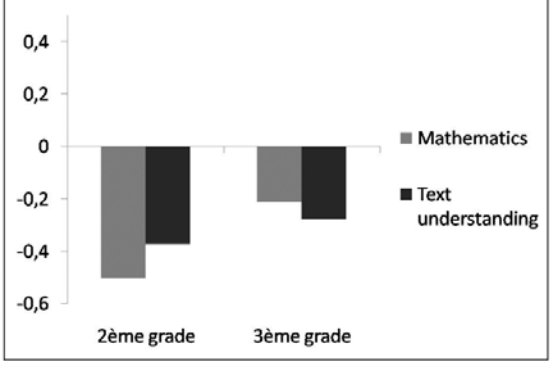


Figure 4. Correlations between frequency of anxiety and academic performance according to grade



Summary

The academic competence of pupils participating in this study is modest but increases progressively following school progression (see Table 3). Academic competence is only modestly related to children's preferences for French and Mathematics, and these findings are difficult to interpret (see Figure 1). In contrast, more meaningful links appear between children's preferences and their emotional experience in relation to Mathematics and French (see Table 4). In a similar manner, significant links appear between performance and negative affectivity (see Table 5).

Finally, this study shows that the emotional experience of young children has important links with education in a school setting, particularly in the case of negative affectivity. The consistency of relations observed provides a strong incentive for the continuation of other investigations of a similar kind in young child, particularly with a longitudinal focus. Taken together, Studies 1 and 2 show that pupils feel differentiated emotions according to the situations. This differentiation not only concerns their emotional repertoire according to the contexts, but the content of the experience for a given emotion according to context as well. Despite extensive testing, particularly in Study 2, the same emotional sensitivity emerged in both groups of children.

5. Discussion and prospects

The studies presented here constitute a first exploration of the emotional experience of elementary school-aged children within the school context. Two complementary goals were pursued: to better understand the ways in which children of this age describe the contents of their emotional experience in school tests situations when they work in the classroom and at home; and to study relations between the emotions experienced in these contexts, academic performance and preference (in Mathematics and French), and children's overall affectivity (positive versus negative affect, and emotional control). Several features of this study deserve comment.

First, it appears that self-reported emotional experiences are highly consistent. This is difficult to explain if we presuppose that children are unable to carry out the necessary introspection for such questioning. Our results, however, converge with other data in the literature on the existence of organized meta-cognitive knowledge relating to the emotions (cf. Pons & Harris, 2005).

Second, the acuteness of children's answers to emotional questioning invi-

tes continued investigation of the development of children's meta-cognitive knowledge about emotions, both in terms of their own emotional experiences and those of others. Indeed, our results show that children distinguish the content and the manifestations of their emotions, and they do this according to contexts in an appropriate manner.

Third, affectivity and emotions experienced according to the educational subjects present complex relations with academic performance and preference, and it is important to better understand the causal influences being played out between these domains. In particular, it is important to establish if negative affectivity results from difficulties in educational settings, or if such emotion difficulties/dispositions manifest themselves in the classroom. Of course, it is also possible that another not yet identified variable lies at the origin of these connections.

Finally, it seems important that teachers should be made aware of some of the issues raised in such research within the context of their education framework. We feel that various points could be communicated to teachers; such as, (1) the richness of children's emotional experience in the school context, (2) the acuity, even for very young pupils, of children's emotional insights, and (3) the ambiguity of the links between emotion and success in school, the nature of which is far from clear. As we would expect, negative emotions are more often associated with difficulties and lower preferences for specific subjects. But, contrary to what would be expected, positive emotions are also sometimes associated with difficulties; which might correspond to the feeling in children of being on a remote setting or even engagement in avoidance strategies. By contrast, negative affects are described by children as more invasive. Thus, the association between feeling positive emotions and poor academic performance would appear to represent a means used by children avoid the negative emotional consequences of learning difficulty and the accumulating negative emotions associated with such difficulties. It is then important for the educator to recognize cases in which the apparently positive emotional presentation of some children belies a painful reality that needs appropriate confrontation. Despite relatively few links with emotional control, future research will need to explore the development of children's emotional regulation in the educational context, and the teacher's contribution to such development.

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