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Kindergarten Children's Emotions, Feeling of Task-Difficulty and Ability Self-Perceptions Before and After Performing an Unfamiliar Domino

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Abstract

This study, being involved in unfamiliar domino for the participating kindergarten children, aimed to examine (a) children's experienced emotions, ability self-perceptions and perceptions of task-difficulty in pre domino performance condition and in post domino performance condition, (b) the effects of students' ability self-perceptions and perceptions of task-difficulty on their experienced emotions in pre- and post- domino performance condition, and (c) the role of children's ability beliefs and feeling of task- difficulty in the impact of the emotions on domino performance. The participants were 180 kindergarten students, 96 girls and 84 boys, age from 69 to 73 months, and they came from 25 classrooms. The results revealed (a) the variability of the intensity of the emotions within and between the pre- and post- domino performance, (b) children felt better in post- than in pre- domino performance, particularly in self-, task- and future activity- related emotions, (c) student estimated their ability as higher in post- than in pre- domino performance, while the pattern was reverse with respect to perceived domino-difficulty, (d) ability self-perceptions, compared to feeling of difficulty, was a more powerful formulator of most the emotions, particularly in pre- domino performance, and (e) the students' pre- performance emotions, perceived task- difficulty, and, mainly, ability beliefs influenced their domino performance, while the feeling of difficulty and, particularly, ability beliefs enhanced the impact of the emotions on domino performance.

The findings are discussed with respect to their applications in children development and education, and to future research.

Key words: Ability Beliefs; Domino performance; Emotions; Feeling of Task-Difficulty.

1. Introduction

Despite the crucial role of students' emotions in their subjective well-being, educational outcomes and personal development (Diener, 2000; Pintrich, 2003; Schutz & DeCuir, 2002; Schutz, Hong, Cross, & Osbon, 2006), apart from test anxiety (Zeidner, 1998, 2007) and attribution-based emotions in academic achievement (Weiner, 1992, 2002), student emotions have been little investigated (Efklides & Volet, 2005; Goetz, Zirngibl, Pekrun, & Hall, 2003; Meyer & Turner, 2002; Pekrun, 2009; Pekrun, Goetz, Titz, & Perry, 2002; Stephanou, 2007; Volet & Jarvela, 2001).

Also, traditionally, cognition and emotions were considered as independent processes of information and behaviour, and, hardly, recently, research has focused on the ways student emotions interact with cognitive, metacognitive and motivational processes in classroom learning (Boakaerts, 2002; Dina & Efklides, 2009; Do & Schallert, 2004; Efklides, 2006b; Efklides & Petkaki, 2005; Pekrun et al., 2002; Schutz & Lenehart, 2002; Stephanou, 2011b; Stephanou, Kariotoglou, & Ntinas, 2011; Turner & Schallert, 2001).

Similarly, while socio-cognitive constructs of student motivation, such as self-beliefs and feeling of task-difficulty have each been linked to academic achievement, not much research has explored their interactive role with emotions in real achievement situations (Anderman & Wolters, 2006; Boekaerts, Pintrich, & Zeidner, 2000; Eccles & Wigfield, 2002; Pintrich, 2000; Stephanou, 2004, 2007, 2011b).

Yet, most empirical work has focused on literacy and mathematics, while other school subjects and extra curriculum activities have been hardly investigated (Baroody & Dowker, 2003; Kilpatrick, Swafford, & Findell, 2001; Mata, Monteiro, & Peixoto, 2009; Morrison, Bachman, & Connor, 2005; Paris, 2005; Stephanou, 2008). Furthermore, such research is very limited in kindergarten context, although the high importance of this period in children's future academic and whole development (Birch & Ladd, 1998; Furrer & Skinner, 2003; Harter, 1999; Rutter & Maughan, 2002; Skinner, 1998; Stephanou, 2005; Viljaranta, Lerkkanen, Poikkeus, Aunola, & Nurmi, 2009). Kindergarten schooling effects are evident for some components of children's literacy and mathematical developing (see Paris, Morrison, & Miller, 2006; Viljaranta et al., 2009). However, preschool children, through the various activities and tasks at school, acquire knowledge and skills that are crucial for later achievement (Duncan, Dowsett, Claessens, Magnuson, Huston, Klebanov, & Japel, 2007; Ponitz, McClelland, Jewkes, Connor, Farris, & Morrison, 2008). General cognitive skills, general knowledge variables, memory and self-beliefs benefit from school experience (see Paris et al., 2006). The schooling effects reflect the classroom content, and the kindergarnt school experience is related to various game- related activities such as fiiling in a pazl or performing a domino.

Overall, it is important to look at kindergartners, because what is 'best practice' or, at least, salient at higher grades may have not the same meaning at kindergarten, since, among others,

metacognitive awareness arise at the age of 4-6 years (Demetriou & Efklides, 1990). For example, young students are highly motivated and estimate their abilities highly, despite their failure, while their competence beliefs and learning motivation tend to decline as they advance in school (Eccles, O'Neill, & Wigfield, 2005; Harter, Whitesell, & Kowalksi, 1992; Lepper, Corpus, & Iyengar, 2005; Stipek & Daniels, 1988; Stipek & MacIver, 1989). Also, understanding the beliefs that kindergarten children develop in various school subjects or tasks is important because these beliefs become the criteria of interpretation of subsequent school and life experience (Aunola, Leskinen, Lekkane, & Nurmi, 2004; Aunola, Leskinen, & Nurmi, 2006; Eccles, 2005; Eccles & Wigfield, 2000; Pianta, 1999). In addition, investigating students' metacognitive awareness about their characteristics, such as competence beliefs and goals, and task characteristics, such as difficulty, has been recognized as a significant predictor of self-regulated learning (Boekaerts & Corno, 2005; Efklides, 2011). For example, students' overestimation of their abilities in a task reflects lack of metacognitive awareness and forms ineffective self-regulation (see Efklides, 2006a,b).

In response to this relative lack on these concepts and their inter-effects in kindergarten, the present study examined kindergarten children's experienced emotions, ability beliefs and perceptions of task-difficulty in pre and after of performing a domino, and the role of these perceptions on the emotions, and domino performance.

1.1 Association of Student Emotion with their Competence Beliefs, Task- Beliefs and Achievement

In sum, the previous research findings regarding the association of emotions with learning, on one side, support that emotions have significant effects on cognitive information processing, motivation, quality of thinking, learning strategies, self- regulation, metacognition, and achievement (Boakaerts, Pintrich, & Zeidner, 2000; Efklides & Volet, 2005; Goetz et al., 2003; Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010). For example, children who feel well at school, compared to children who do not feel well at school, are more enthusiastic in participating at classroom activities, try harder, usually succeed, and, thus, become more confident about their school abilities (Ladd, Birch, & Bush, 1999; Mashburn, Hamre, Downer, & Pianta, 2006; Skinner, Wellborn, & Connell, 1990; Stephanou, 2005, submitted; Stipek, 1998). Also, positive emotions, such as curiosity, enjoyment, hope and pride, enhance motivation, facilitate learning and increase performance (Clore & Huntsinger, 2009; Meyer & Turner, 2002, Pekrun et al., 2002; Stephanou, 2007, 2011b), whereas, intense negative emotions, such as anxiety, hopelessness, boredom and insecurity, and related thoughts, like a feeling of incompetent, interface with learning, decrease motivation, and is related to low performance (Kuyper, van der Werf, & Lubbers, 2000; Pekrun, 2005, Pekrun & Schutz, 2007; Pekrun et al., 2010; Zeidner, 2007).

On the other side, cognitions, such as children's goals, values, motives, perceptions of the task and perceptions of self, influence an emotional response to a given classroom situation (Pekrun, 2009; Turner & Schallert, 2001; Weiner, 2005). For example, high expectations of successful performance, beliefs of adequate ability to master the task and high value beliefs for the task influence the generation of the emotion of pleasure (Glaser-Zikuda, Fub, Laukenmann, Metz, & Randler, 2005; Glaser-Zikuda & Mayring, 2003; Pekrun, 2000). On the contrary,

beliefs of inadequate ability to master the task contribute to hopelessness and anxiety (Pekrun, 2000; Stephanou et al., 2011; Zeidner, 1998). Perceived task-difficulty influences task- and future activity- emotions like boredom, enthusiasm and confidence (Efklides, 2006a; Pekrun, 2009; Pekrun & Schutz, 2007).

1.2 Association of Students' CompetenceBbeliefs and Task- Beliefs with Achievement

Recent research on student motivation focuses on sociocognitive constructs and their role in academic learning and achievement (Boekaerts, Pintrich, & Zeidner, 2000; Pintrich & Schunk, 2002; Stephanou, 2008; Wosnitza, Karabenick, Efklides, & Nenniger, 2009). Competence beliefs and task-difficulty beliefs are two such constructs included in the expectancy-value model of motivation (Eccles & Wigfield, 2002; Pintrich, 2003; Wigfield & Eccles, 2000), on which this study is partly based.

In sum, previous research on academic achievement, part of which was just above presented, has supported the positive role of ability self-perception on performance, even after controlling for ability (Beane, 1999; Pintrich & Schunk, 2002; Stephanou, 2004, 2008; Stephanou et al., 2011). Students who estimate their ability in academic situations highly (and are highly motivated), use effective achievement strategies, persist even when they faced with challenging task, insist in pursuing their goals, and perform better than the children who have low motivation and ability beliefs (Anderman, 2004; Dermitzaki & Efklides, 2000; Efklides, 2001; Ryan & Deci, 2000; Stephanou & Tatsis, 2008; Wigfield & Eccles, 2000, 2002; Zimmerman, 2000). Similarly, perceived task difficulty is associated with the academic performance, since it facilitates the awareness of the process in pursuit the target goal and correlates strongly with self-regulatory process (Efklides, 2006b, 2011; Yzebut, Lories, & Dardenne, 1998; Zimmerman & Schunk, 2001)

1.3 Aim and Hypotheses of the study

This study, being involved in unfamiliar domino for the participating kindergarten children, aimed to examine (a) children's experienced emotions, ability self-perceptions and perceptions of task-difficulty in pre domino performance condition and in post domino performance condition, (b) the effects of students' ability self-perceptions and perceptions of task-difficulty on their experienced emotions in pre- and post- domino performance condition, and (c) the role of children's ability beliefs and perceived task- difficulty in the impact of the emotions on the domino performance.

The hypotheses of the study were the following:

The students will experience various and a variety of intensity of emotions in pre- and post-domino performance condition (Hypothesis 1a). There will be differences between the pre- and post- domino performance in emotions, particularly in self- and task- related emotions (Hypothesis 1b). While the children will estimate their ability in the domino as adequate and the domino as a not difficult task, their ability beliefs and perceptions of task- difficulty will differ between the pre- and post- domino performance condition (Hypothesis 2). Both ability beliefs and feeling of difficulty will positively influence the generation of the emotions in pre- and post- performance condition but their relative power in formulating them will differ

between the two conditions and within each condition (Hypothesis 3a). Also, ability beliefs and feeling of difficulty will mainly influence the self- related emotions (competence, confidence) and the task- related emotions (not boredom- boredom), respectively (Hypothesis 3b). The students' pre- domino performance emotions, ability beliefs and feeling of task-difficulty will positively influence their subjectively perceived domino performance (Hypothesis 4a). Ability beliefs and feeling of task-difficulty will enhance the impact of the emotions on performance (Hypothesis 4b).

2. Method

2.1 Participants

The participants were 180 kindergarten students, 96 girls and 84 boys, age from 69 to 73 months. The children randomly came from 25 classrooms of twenty different Kindergartens from various regions of Greece, and they represented various parental socioeconomic levels. None of the participating children was familiar with the specific domino which was used in this study.

2.2 Measures

All questionnaires were in Greek Language. To facilitate children's understanding of the response scales the procedure was adapted from Valeski and Stipek (2001), which is below presented in the emotion scale and in the Procedure section (see also Stephanou, 2005, Stephanou & Balkamou, in press).

Emotions. Students' emotions in pre- and post- domino performance were assessed by mentioning the extent to which they experienced the emotions of satisfaction, pleasure, not boredom-boredom, competence, happiness, hope, encouragement, confidence, not angry-angry, calmness, cheerfulness and enthusiasm.

The emotions had the form of adjectives with two opposite poles, with the positive one having the high score of 5, representing the positive emotion, and the negative one having the low score of 1, representing the negative emotion (e.g., happy 5 4 3 2 1 unhappy). In accordance to Valeski and Stipek (2001), the five point scale was represented by five bars of increasing size. The smallest bar was placed at the one point of the scale, the largest bar was placed at the five point of the scale, and the rest three bars, gradually increasing in size, were placed between these two opposite poles. Children were read aloud the questions, and they were asked to point the bar that represents the extent of their specific emotion (e.g., 'You can use these bars to show me how happy you are right now'). The children were also asked to describe their emotions in free answers, as a check for understanding. The construction of the scale was consistent with previous researches (see Efklides & Volet, 2005; Goetz et al., 2003; Pekrun, 2009; Weiner, 1992, 2005), and it is a valid and reliable research instrument in studying emotions experienced in achievement situations in Greek population (see Stephanou, 2005, 2007, 2011b). The scale was reliable, since alpha value was at .72.

Ability self-perception. Ability self- perception scale comprised four items (e.g., 'You can use these bars to show me how good you are in this domino'). Responses ranged from 1 = not

at all good to 5 = excellent. The consistency of the scale was based on previous similar scales (see Eccles & Wigfield, 2002; Nurmi & Aunola, 2005; Pekrun, 2000; Spinath & Spinath, 2005; Stephanou, 2004, 2007, 2008, submitted). Cronbach's alpha value was .82.

Perceived domino difficulty. Childern's perceptions of the domino difficulty was examined by a scale of four items (e.g., 'You can use these bars to show me how difficult is this domino for you'). Responses ranged from 1 = very much to 5 = not at all difficult. The construction of the scale was in accordance to previous literature (see Eccles & Wigfield, 2002; Efklides, 2002; Pintrich & Schunk, 2002). Cronbach's alpha was .79.

Perceptions of domino performance. Children's perceptions of domino performance scale consisted of two items (e.g., 'You can use these bars to show me how well you did in this domino'). Responses ranged form 1 = not at all well to 5 = very much. Similar scale was used by previous studies (see Pintrich & Schunk, 2002; Stephanou, 2004, 2007). The value of Cronbach's alpha was .83.

Personal factors. A set of questions was about personal factors, such as age and gender.

2.3 Procedure

First, teachers', school administrators' and parents' permission was assured. Then, the participating children were contacted and familiarized with the interviewers, who were the authors of this study, and they were assured anonymity and confidentiality. Interviewers had also familiarized children with the scales to ensure that they understood the answering scales. More precisely, the children were administered the questionnaire, after they had practiced on the procedure and they had mastered 100% of the procedure. The children practiced on the extent to which they liked some toys, such as car and doll.

The children were interviewed individually during a regular class in a quite classroom in their kindergarten. The interviewers, initially, exhibited the domino performance to the children, and, then, asked them to perform the domino. The participants were administrated the questionnaire twice, in pre- and after- domino performance. In both conditions, the children responded, first, to the emotions scale and, then, to the rest of the scales. The children were periodically asked by the interviewers to describe their answers in words, as a check for understanding.

As above mentioned, the children were not familiar with this specific domino. Data were collected at the middle of a kindergarten year to ensure that the children had good time to feel safe in their school environment.

3. Results

3.1 Emotions, Ability Self-Perception and Feeling of Task-Difficulty in Pre- and Post-Domino Performance

Inspection of Table 1 reveals the variability of the intensity of the emotions between the condition of pre- domino performance and the condition of post- domino performance, and within each of them. Specifically, the results from two repeated measure Anovas, in which

the thirteen emotions was the within-subjects factor, showed significant effect in pre- domino performance, $F(11, 169) = 13.50$, $p < .01$, $\eta^2 = .50$, and in post- domino performance, $F(11, 169) = 16.50$, $p < .01$, $\eta^2 = .57$. Post hoc pairwise comparisons showed that, in pre- domino performance, the children mainly experienced the intense positive emotions of pleasure, not anger, encouragement and satisfaction, whereas hope, confidence, calmness, competence were the bottom positive emotions. After performing the domino, the children mainly felt the intense positive emotions of encouragement, not anger, enthusiasm and not boredom, while they experienced to a lower extent the positive emotions of competence, hope, calmness and confidence.

In addition, the results from repeated measure Anovas, one for each of the emotions, in which the pre- and post- domino performance condition was the within-subjects factor, showed that the children felt better in post- performance than in pre- performance, particularly in self-, task- and future activity- related emotions: confidence, hope, not boredom encouragement and enthusiasm.

These findings are in agreement with Hypotheses 1a and 1b.

The findings regarding the children's perceptions about their ability in domino and their perceptions of domino difficulty confirmed Hypothesis 2. More precisely, the children had from moderate to high perceptions of task-ability and did not perceived the domino as very difficult. Also, they students estimated their ability as higher in post- than in pre- domino performance, while they perceived the domino as more difficult after they performed it than in pre- performance condition.

Table 1 Descriptive statistics and differences between pre- and post- domino performance in students' emotions, ability beliefs and feeling of domino difficulty

	Pre- domino performance		Post- domino performance			
	Mean	SD	Mean	SD	F(1, 178)*	n^2
Happiness	3.73	1.03	4.14	.95	35.40	.18
Satisfaction	3.78	.96	4.11	.95	21.10	.12
Pleasure	3.89	.96	4.20	.93	19.55	.11
Cheerfulness	3.69	1.08	4.07	1.06	23.15	.13
Calmness	3.48	1.13	3.97	1.11	51.82	.25
Not anger - anger	4.05	.98	4.43	.80	29.67	.16
Not boredom- boredom	3.67	1.11	4.22	1.06	61.80	.28
Competence	3.56	1.14	3.95	1.04	32.90	.18
Encouragement	3.87	.92	4.37	.80	55.20	.26
Confidence	3.44	1.11	3.98	1.07	66.75	.30
Hope	3.36	1.13	3.96	1.08	69.30	.31
Enthusiasm	3.84	.99	4.38	.85	59.20	.27
Ability beliefs	3.76	1.10	4.10	.98	19.20	.12
Feeling of difficulty	3.75	1.18	3.49	1.05	11.52	.07

Note: *: All F- values are significant at the .01 level of significance.

3.2 *Effects of Feeling of Task-Difficulty and Ability Beliefs on Emotions in Pre- and Post-Domino Performance*

The results from multiple regression analyses (Table 2), with stepwise method, in which feeling of difficulty and ability self-perceptions were the predictors and each of the emotions was the predicted variable, reveled that (a) ability self-perceptions and feeling of difficulty, as a group, explained a great amount of the variance of the emotions in both pre- domino performance, R^2 ranged form .45 to .65, and post- domino performance, R^2 ranged form .35 to .56, and (b) in both pre- and post- performance condition, ability self-perceptions and feeling of difficulty, as a group, explained a greater amount of the variability of the emotions of pleasure, satisfaction and calmness than they did in the rest of the emotions. Also, the students, who perceived their ability in the domino as higher and perceived the domino as less difficult, compared to those who perceived the respective factor as less favouring, experienced more positive emotions in both conditions pre- and post- performance. However, while both ability beliefs and feeling of difficulty accounted in the variance in the emotions in pre- and post- performance condition, their relative power in influencing emotions differed between the two conditions and within each condition. More precisely, (a) ability self-perceptions, compared to feeling of difficulty, was a more powerful formulator of most the emotions in both conditions, except for satisfaction and pleasure in pre- performance condition, and not boredom in post- performance condition, (b) the difference between the two predictors in formulating emotions appeared to be higher in the pre- performance condition than in the post- performance condition, and (c) both ability beliefs and feeling of difficulty influenced differently the emotions in the pre- and post- performance conditions.

The above findings totally confirmed Hypothesis 3a, and partly confirmed Hypothesis 3b.

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Table 2 Multiple regression analyses for the effects of ability beliefs and feeling of task- difficulty on emotions in pre- and post- domino performance

		Pre- domino performance						Post- domino performance					
(N = 180)	Predictors	R^2	R^2ch	Fch*	F*	beta	t*	R^2	R^2ch	Fch*	F*	beta	t*
Happiness	Ability beliefs	.46	.46	131.50	75.00	.46	5.25	.29	.29	63.60		.35	4.40
	Feeling of task- difficulty	.49	.035	10.40		.28	3.25	.35	.070	16.55	43.15	.32	4.10
Satisfaction	Ability beliefs	.52	.52	167.00		.41	5.20	.43	.43	114.45		.44	6.30
	Feeling of task- difficulty	.59	.069	25.85	110.30	.40	5.05	.51	.080	25.22	78.80	.35	5.02
Pleasure	Ability beliefs	.57	.57	206.90		.43	5.90	.50	.50	155.75		.53	8.06
	Feeling of task- difficulty	.65	.076	32.90	141.55	.42	5.75	.56	.060	20.90	98.55	.30	4.60
Cheerfulness	Ability beliefs	.53	.53	173.28	173.30	.72	13.15	.28	.28	60.60		.40	4.90
	Feeling of task- difficulty	--	--					.31	.030	6.70	34.75	.21	2.58
Calmness	Ability beliefs	.57	.57	208.85		.62	7.86	.42	.42	111.65		.49	6.35
	Feeling of task- difficulty	.59	.012	4.60	109.20	.17	2.15	.49	.078	23.55	75.90	.34	4.85
No anger - anger	Ability beliefs	.49	.49	150.45		.53	6.12	.43	.43	117.35		.52	7.20
	Feeling of task- difficulty	.51	.020	6.25	79.50	.21	2.49	.46	.033	9.30	66.50	.22	3.05
Not boredom-	Ability beliefs	.43	.43	119.10		.51	5.57	.32	.32	74.65		.45	5.60
boredom	Feeling of task- difficulty	.45	.016	4.40	63.65	.19	2.09	.35	.029	6.75	42.00	.20	2.58
Competence	Ability beliefs	.50	50	151.85	151.85	.71	12.55	.31	.31	70.50		.39	5.00
	Feeling of task- difficulty	--	--					.36	.052	12.35	44.00	.28	3.55
Encouragement	Ability beliefs	.42	.42	111.85		.40	4.50	.42	.42	110.30	110.30	.64	10.40
	Feeling of task- difficulty	.47	.044	12.80	68.25	.32	3.57	--	--				
Confidence	Ability beliefs	.51	.51	162.30	162.30	.71	12.75	.39	.39	100.20		.46	6.25
	Feeling of task- difficulty	--	--					.45	.054	14.80	62.45	.28	3.90
Hope	Ability beliefs	.55	.55	191.25	191.25	.74	13.80	.35	.35	84.65		.45	5.80
	Feeling of task- difficulty	--	--					.39	.040	10.20	50.85	.24	3.20
Enthusiasm	Ability beliefs	.36	.36	87.95	87.95	.60	9.40	.40	.40	102.00		.52	6.90
	Feeling of task- difficulty	--	--					.42	.024	6.20	56.40	.19	2.50

Note: *: All F- values, $p < .01$; Fch $\leq$ 6.75, $p < .05$, Fch > 6.75, $p < .01$; t $\leq$ 2.58, $p < .05$, t > 2.58, $p < .01$; -- : $p > .05$.

3.3 Effects of Pre- Performance Feeling of Task-Difficulty, Ability Beliefs and Emotions on Domino Performance

Hierarchical regression analysis (Table 3), in which perceived domino performance was the predicted variable and the pre- performance emotions, ability beliefs and perceived task difficulty were the predictors, was conducted. More precisely, emotions entered into first step and both ability self-perceptions and feeling of task-difficulty entered into second step of the analysis. The results revealed that (a) the two set of predictors had significant effect on domino performance explaining 58% of the amount of the variance, (b) the intense positive emotions, the high ability self-perceptions and the low feeling of difficulty leaded to perceived high domino performance, (c) while all of the emotions were positively associated with domino performance, only the emotions of enthusiasm, encouragement, calmness and, mainly, hope had unique contribution in performance, and (d) the feeling of difficulty, $R^2ch = .013$, and, mainly, ability beliefs, $R^2ch = .042$, enhanced the impact of the emotions on domino performance. Hence, Hypotheses 4a and 4b were in the main confirmed by these findings.

Table 3 Results from hierarchical regression analyses for the role of ability beliefs and feeling of difficulty in the impact of emotions on domino performance

	R^2	R^2ch	Fch	F	b	t
Hope	.43	.43	115.45	115.45	.30	4.55
Enthusiasm	.47	.046	13.20	68.90	.17	2.58
Calmness	.51	.041	12.65	53.65	.17	2.48
Encouragement	.53	.020	6 80	42.10	.10	2.15
Ability beliefs	.57	.042	14.15	50.00	.23	3.48
Feeling of difficulty	.58	.013	4.40	48.70	.17	2.40

Notes: All F- values, $p < .01$; Fch $\leq$ 4.40, $p < .05$, Fch > 4.40, $p < .01$; t $\leq$ 2.58, $p < .05$, t > 2.58, $p < .01$.

4. Discussion

This study aimed to examine kindergarten children's emotions, perceptions of task- difficulty and ability self-perceptions before and after performing an unfamiliar domino, the effects of perceptions of task- difficulty and ability self-perceptions on the emotions in both conditions, and the interactive role of pre- domino performance ability beliefs, task beliefs and emotions on the perceived by the children domino performance.

4.1 Emotions

The findings regarding the children's emotions in pre- and post- domino performance were in the main consistent with our predictions. Specifically, the kindergarten students experienced moderate to intense positive emotions. This finding might be partly explained by the age of the participants. More accurately, preschool children tend to optimize their life experience, and use an optimistic style in explaining achievement behaviour (see Peterson & Steen, 2005; Roberts, Brown, Johnson, & Reinke, 2005; Snyder, Rand, & Sigmon, 2005; Stephanou, 2011a; Wigfield & Eccles, 2002). However, it should be mentioned that there was variability in

emotions which indicated that some of the children did not experience the situation positively. This needs to be further researched.

The high importance of the domino for the children, and the high importance of performing well in the domino, may be another explanatory factor of these findings, since in such conditions individuals feel intense and various emotions (Stephanou, 2007, 2011b; Weiner, 2001, 2002).

Another explanation of this result might be the combination of children's ability self-perceptions, familiarity, perceptions of task-difficulty and importance of the task for their ego. More accurately, empirical evidence in education suggests that students' emotions may range from highly positive to highly negative in a difficult, unfamiliar and relevant to their goals learning situation (Efklides, 2001, 2006b; Pekrun et al., 2010; Volet, 2001; Wosnitza & Volet, 2005). The participating children in the present study did not perceive the domino as a very difficult task, and had not experience in this specific domino. On the other hand, students who feel competent develop coping strategies to protect well-being, and are more motivated to pursue their goals (Eccles & Wigfield, 2002; Guay, Marsh, & Boivin, 2003, Schunk & Zimmerman, 2006). Hence, in the present study, the children probably were highly motivated to succeed in the domino, and felt competent by ascribing domino difficulty to lack of experience, not to lack of ability. However, this needs to be further investigated.

Also, the participants, being at the specific age, might have expected to perform well, and, consequently, they felt well before performing the domino. Similarly, confirmation of their high performance expectations leaded to positive emotions.

Interestingly, it seems that performing the domino was an interesting and challenging, but not unattainable, task for the children, since, in pre- domino performance, they mainly experienced the positive emotions of pleasure, not anger, encouragement and satisfaction, and, since, in post- domino performance, they mainly experienced the positive emotions of encouragement, not anger, enthusiasm and not boredom. In addition, the participants felt better in post- than in pre- domino performance, particularly in self-, task- and future activity-related emotions: confidence, hope, not boredom, encouragement and enthusiasm, suggesting the high expectations of success in similar tasks in the future. Also, based on Seligman's (2002) view of classification of emotions, the children mainly experienced emotions which are related to the present (e.g., pleasure) and the future (e.g., encouragement). Yet, the emotion of satisfaction reflects the children's effort to achieve their goal (see Anderman & Wolters, 2006; Frijda, 2009; Pekrun & Stephens, 2009).

Furthermore, it seems that the children regulated their emotions before and after performing the domino. Relevant to the topic literature shows that preschool children become increasingly skilled at employing diverse emotion regulation strategies (Holodynski & Friedlmeier, 2006). However, research needs to explore the emotion regulatory strategies in various similar tasks.

4.2 Ability beliefs, Feeling of Task- difficulty and Their Effects on Emotions

The findings regarding self- and task- beliefs, confirming our expectations and previous

reports (e.g., Aunola et al., 2006; Eccles et al., 2005; Wigfield & Eccles, 2002; Wigfield, Byrnes, & Eccles, 2006), indicated that the kindergarten children had moderate to high perceptions of ability perceptions in domino and that they did not perceive the domino as a very difficult task.

Furthermore, the fact that the children after performing the unfamiliar domino enhanced their ability beliefs in it corresponds to research evidence documenting the crucial and positive role of familiarity in self- beliefs (see Efklides, 2001, 2006b; Wosnitza & Volet, 2005).

Also, the children, perceiving the domino as more difficult after than before performing it, supported the notion that young children's metacognitive awareness is low (see Demetriou& Efklides, 2000).

Yet, in consistency with our prediction and research evidence in classroom situation (Pekrun et al., 2007; Pekrun et al., 2010; Schutz & Lenehart, 2002; Turner & Schallert, 2001), the children's feeling of domino difficulty and perceptions of ability in domino, together, positively influenced their emotions after and, mainly, before performing the domino. Probably, performing the domino in itself rather than the self- and task- beliefs influenced the children's emotions. Research needs to explore this issue more.

Furthermore, the two concepts, as a group, best predicted the emotions of pleasure, satisfaction and calmness, that are task- and goal- related emotions (Frijda, 2009; Pekrun, 2009), than the other emotions. In addition, while both ability beliefs (Glaser-Zikuda et al., 2005; Stephanou et al., 2011; Zeidner, 1998) and feeling of difficulty (Efklides, 2006a; Pekrun & Schutz, 2007) accounted in the variance in the emotions in pre- and post- domino performance condition, their relative power in influencing emotions differed between the two conditions and within each condition. For example, ability beliefs, compared to feeling of difficulty, were a more powerful formulator of all of the emotions, except for satisfaction and pleasure in pre- domino performance, and boredom in post- domino performance, in which the pattern was reverse. These specific findings partly supported the view that ability self perceptions and perceived task-difficulty is mainly related to self esteem-, and task- and future activity- related emotions, respectively (Efklides, 2006a; Goetz et al., 2003; Pekrun et al., 2002; Weiner, 1992, 2002).

4.3 Performance

The findings regarding domino performance were in the main consistent with our expectations and previous research evidence. More accurately, the children, who experienced intense positive emotions, perceived the domino as an easy task, and had high perceptions of their ability in the domino before performing it, achieved high domino performance.

Furthermore, in line with other studies (see Pekrun, 2009; Clore & Huntsinger, 2009; Meyer & Turner, 2002), the expectancy- and achievement- related emotions of encouragement and, mainly, hope, had unique contribution in performance. Also, confirming the existent literature (e.g., Efklides, 2006a,b; Pekrun et al., 2010; Pekrun & Schutz, 2007; Zeider, 2007), the task-related emotions of enthusiasm and calmness influenced domino performance.

Similarly, perceptions of domino-difficulty and, particularly, ability beliefs in the domino proved unique predictors of domino performance, in line with similar research (e.g., Stephanou, 2004; Stephanou & Tatsis, 2008; Wigfield & Eccles, 2000; see also Anderman & Wolters, 2006; Schunk & Zimmerman, 2006). In addition, confirming previous studies in achievement motivation (e.g., Stephanou, 2007, 2011b; Stephanou et al., 2011), both concepts, mainly ability self-perception in domino, enhanced the impact of emotion on performance. The dominant role of ability self-perception in performance may be partly related to participants' beliefs that ability is required in performing well. The children might have formulated a belief that high ability is a prerequisite of good performance in a given task, particularly in an unfamiliar domino. These beliefs influenced their emotional experience before performing the domino, and, in turn, the performance in itself. Future research should examine the self- and task- factors that seem to influence the effect of emotions on performance in various tasks at school.

4.4 Implications of the Findings for Children Development, Educational Practice, and Future Research

The findings from the present research suggest the significant role of a non school subject task in students' experienced emotions in kindergarten, which may influence their whole achievement and development. Therefore, it is necessary to design effective kindergarten environment which facilitates children's learning and well-being. Research suggests that qualities such as caring and opportunities for participation and success may be important to the development of enjoyable learning environment.

The results from this study also reveal that children have ability- and task- beliefs which influence their emotional experience before and after performing the specific task. These beliefs largely develop in certain classroom context. Students may enhance these beliefs, when they are involved into useful, interest and meaningful task and activities.

The present findings contribute to our knowledge on the association between metacognitive experience, competence beliefs and emotions in this pre-schooling period, and on the interactive pattern of these concepts on performance in an unfamiliar task.

Overall, it is important to look at kindergartners because they have certain needs and beliefs that are different from older children and higher grade students. In addition, to better understand Kindergarten schooling effects on children developing, research should expands, beyond literacy and mathematics, examining various achieving and learning activities and tasks. Also, investigation needs to clarify the interaction of the examined factors on students' development of motivation and quality of learning. Finally, it is interesting to examine how self-factors and teacher's and classmates' behavior work together and differentially affect, emotions, self- and task- beliefs and achievement in kindergartn.

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