

Knowledge About Emotions As An Indicator Of Wellbeing Among Early Childhood Learners

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Abstract

Emotions are a vital part of human life. All human beings are emotionally driven. So, the knowledge about emotions is fundamental for everyone, especially for children in the early stages of development for their survival in a diverse community. The present study aimed to focus on the emotional recognition skill of early childhood learners (age 3-6 years) in Pakistan as an indicator of wellbeing. The study postulates that at the stage of early childhood learners can recognize emotions but this skill is in the development process and continues to improve with age. Two hypotheses were formulated under this assumption. To test these hypotheses three objectives were developed. First, on the level of accuracy in recognizing emotion (each and on the total score). Second, on the level of accuracy in recognizing emotion (basic and complex), and third on gender differences. Multi-stage Stratified Random sampling technique was used and the total sample of the study was (n = 209), boys (n= 81) and Girls (n = 128) in the early childhood stage. Semi-structured interviews were conducted in dual languages (Urdu & English). Emotions cue cards were used along with storylines using emotion words as a technique of data collection. Data were analyzed by using various statistical techniques and were displayed in the form of tables. The main findings along with discussion points were discussed and major conclusions were drawn. Two major conclusions were, first, that learners in the early childhood stage of development in Pakistan can recognize emotions (overall, basic and complex). In addition, there is no gender difference in recognizing emotions both gender have an equal ability to recognize emotions correctly.

Keywords: Emotions Knowledge; Emotions understanding; Emotional Wellbeing, Social-Emotional Wellbeing; Recognizing Emotions through Facial Expression.

Introduction

Emotions are a topic of great interest today. Because it is a key element of human positive development and wellbeing. It is a topic of immense importance that there is an intense debate in social-emotional literature. Goleman defined them as “a feeling related to extra thoughts, including its biological and psychological states of mind regarding behaviors” (Goleman, 1995; Pânișoară et al., 2015). In 2003, Denham & Burton stated that there is two regulatory mechanism of emotions, behaviour within ourselves and due to interaction with others. Emotions are a fundament part of life. Every human being exhibits a range of emotions even an infant also exhibits various emotions but their range is limited. As stated by Lewis (2008) by the age of three to four years young children display almost all the emotions that an adult does so. Children have learned all of the emotions at a young age, though their understanding does not go hand in hand with their acquisition. Though the children have acquired the vocabulary of basic emotions by the age of 4 to 6 years (Ridgeway et al., 1985; Baron-Cohen et al. 2010), their accuracy in identifying them through no-verbal cues continues to enhance up to late adolescence (Herba & Phillip, 2004; Rodger et al., 2015; Grobras et al., 2018; Griffiths et al., 2020).

Emotions and Age

Darwin and his followers advocated that there is a set of basic level emotions that is a part of our universal heritage. Various researchers have researched on this ground and concluded that a toddler could differentiate and discuss a range of emotions (Dunn et al., 1987). They start to label different emotions (Ridgeway et al., 1985) and can talk about their own and others’ emotions (Bretherton et al., 1986; Wellman, 1995). They are capable of accurately identifying at least four basic emotions, happy, sad, angry, and scared (Dehham, 1986; Wellman et al., 1995). Moreover, researchers have the view that children can understand emotion as they are internal feelings they can distinguish them from the cause that elicits that particular emotion and also from the behaviour that is the result of the emotion (Wellman et al., 1995). Both theory and research have supported the assumption of early understanding of emotions that children by the third year of age have a refined understanding of at least basic level emotions when biological-based cues such as facial expressions are present (Widen & Russell, 2008). While in the studies in which more structured tasks were chosen the early childhood learners’ concept appeared to be less complete as it is expected (Widen & Russell, 2008).

In 1992, Markam & Adams argued that the reason for the lower performance of early childhood learners (4 years) is not due to the task complexity but rather due to the fact that their skills are still developing. Following the same notion, Vicari et al. (2000) also concluded that the facial recognition skill continues to develop during school years. As the children mature they begin to combine facial and situational cues and their abilities get strengthened and refined with age (Cummings, 2009). As children have learned the vocabulary about a wide range of emotions up to age six but the accuracy in identifying affective facial expressions continues to develop till early adolescence (Herba & Phillips, 2004; Rodger et al., 2015; Grosbras et al., 2018).

Studies on gender differences have shown different results some of them found that girls are better at emotion recognition tasks as compared to boys (Cutting & Dunn, 1999; Parent et al., 1999; Vargas & Vélez, 2003; Bosacki & Moore, 2004) whereas others state no significant difference (Navarro et al., 2002).

Basic and Complex Emotions

As literature about emotions suggest that emotions do not emerge at the same time in human life. There is a category of emotions that appear earlier in life called basic emotions. Basic emotions are also sometimes

called primary emotions. Basic emotion theory postulate that there are a limited number of emotion (e.g. happy, sad, anger, sad) that are biologically and psychologically basic for all human being (Wilson-Mendenhall et al., 2013). Ekman identified six (i.e. happy, sad, fear, anger, surprise, and disgust), and Plutchik identified eight into opposite pairs (i.e. happiness and sadness, anger and fear, trust and disgust, and surprise and anticipation). Though there is no consensus on the exact number of emotions. The most recent research conducted by researchers identifies there are only four basic emotions joy, sadness, anger, and fear (Jack, et al., 2014; Jack et al., 2016). That is a cross-culturally common facial expression. They also identify that anger and disgust, fear and surprise shared some similar facial gestures (Jack et al., 2014). Other researchers also proposed similar four basic emotions in their research (Gu et al., 2015, 2016; Wang & Pereira, 2016; Zheng et al., 2016). Therefore present study also these four basic emotions (happy, sad, angry, and scared) were selected.

In contrast to basic emotions that are biologically driven complex emotions are context and culture-dependent (Griffiths, 1997; Izard, 2007). These emotions are mostly belief-based rather than situation-based (Harris, 1989). They as sometimes called secondary emotions. As the child moves to the end of the second year of life they start to develop a concept of differentiated “self” a part different from others. Standards, rules, and goals (SRG) set the ground to develop self-conscious emotions. In which the child compares himself self to SRG. Self-conscious emotions are also called moral emotions. Children by the end of the second-year start to make judgments of their actions and have developed a wide array of self-conscious evaluative emotions (i.e. embarrassment, guilt, shame, jealousy, and pride).

Moreover, the research in the area of complex emotions in young children under the seven-year of age indicates that they have difficulty in understanding complex emotions (e.g. excited, grateful, guilty, and jealousy), and they lacked an understanding of the situation (Harris et al., 1987). However, recent research studies advocate that although early childhood learners are not able to choose correct emotions, they usually assimilate them to a similar valence basic emotion (Bosacki & Moor, 2004; Russell & Paris 1994; Widen & Russell, 2010). Therefore, they have required a more explicit and differentiated understanding of complex emotions.

Emotion Recognition: Facial Expression

One of the distinctive areas of research on affective development is facial expression recognition skills. According to Ekman (1992), the face is the primary indicator of human emotions. Moreover, facial expressions are most difficult to deny. Because they are clearly visible and are quite difficult to hide especially at a young age. Recognition of emotions is an essential skill that provides information about others’ emotional states. Researchers have a point of view that infants understand emotions from facial and vocal expressions (Denham, 1998; Izard, 1971; Walker-Andrews & Lennon, 1991). Early childhood learners typically depend on facial expressions to infer others’ emotions (Ceschi & Scherer, 2003; Holder & Kirkpatrick, 1991). Therefore, emotion recognition is central to social-emotional wellbeing.

The facial expression recognition technique is the most common way to examine the knowledge of early childhood learners. The child is presented with a situation (e.g. a brief story) and an emotion word, and the child’s task is to select the facial expression that best suit the situation (e.g., Camras & Allison, 1985; Camras et al., 1986; Dashiell, 1927; Felleman et al., 1983; Green & Ekman, 1973; Izard, 1971; Odom & Lemond, 1972).

Significance of the study

Emotions have a biological basis but it is the context that drives such emotional responses among human beings. Therefore, the knowledge about the emotions along with their contextual understanding is very important for early learners as they have to experience diverse social settings (one of them being at school). Moreover, the recognition of these emotions predicts their positive social adjustment in school. Emotions recognition is one of the important components of emotional competence that contribute to wellbeing. The accurate identification of such affective signals led to various positive outcomes later in development, such as academic readiness, enhanced language skill, academic success (Campbell, 2002; Denham, 2006; Denham et al., 2012), social integration (Sette et al., 2017), peer adjustment (Schultz et al., 2000; Izard et al., 2001), emotional-regulation (Denham et al., 2012), mental health (Ciarrochi et al., 2003) that promote learners overall wellbeing. The children who acquired this essential skill are able to decode information from situational cues easily and are liked by their peers (Nowicki & Duke, 1992). Because they can predict others' behaviour as well as can also regulate their own emotion according to the demand of the situation. Therefore, this enhanced understanding of one's own and others' emotional behaviour enable them to adjust to any social context according to the need of the situation.

The present study may likely inform parents, teachers, and school counselors about the current level of the learner's emotional competence in recognizing emotions. Moreover, it helps the parents and school counselors to devise remedial plans for the learners by identifying areas of emotion knowledge in which the learners need improvement through training and counseling, that will contribute to their wellbeing in school and overall in life.

Purpose of the study

The essential skill of emotion recognition leads to various social-emotional competencies hence wellbeing. The present study aimed to investigate this fundamental skill among preschool learners of Pakistan. As, during this developmental stage, they have to enter into a new diverse social setting that is school, and their knowledge about emotions and their ability to recognize them accurately is essential for their school adjustment as well as for their overall wellbeing in the life. In this regard, it is very much necessary for them to recognize different emotions so that they can initiate social interaction positively and effectively with each other.

Therefore, the present study focuses on young school-going children's (3-6 years) ability to recognize different emotions. Moreover, the study focuses on the recognition of emotions by the early childhood learners on four basic (happiness, sadness, anger, and scared) and four complex emotions (excitement, jealousy, embarrassment, and pride). These all emotions emerged in the children at an early age normally up to the age of six years they can recognize and express them with proper understanding. Thus, the present study postulated that learners in early childhood have adequate knowledge of all these emotions and can recognize them with the help of situational cues. But, during early childhood, this skill is still emerging because basic emotions emerge earlier in life and complex emotions emerged after basic emotions in life. Moreover, gender differences exist in recognizing overall all emotions as well as basic and complex emotions.

Hypotheses

Null Hypothesis

H₀₁: Early childhood learners (3-6 years) do not have significant knowledge about emotions to recognize them.

H₀₂: There is no gender difference in recognizing emotions by the early childhood learner.

Alternate Hypothesis

H₁: Early childhood learners (3-6 years) have significant knowledge about emotions to recognize them.

H₂: The gender difference exists in recognizing emotions by the early childhood learner.

Objectives:

1. To find out the level of accuracy in recognizing emotions (each and overall) by early childhood learners.
2. To identify the level of accuracy in recognizing basic and complex emotions by early childhood learners.
3. To compare the gender differences in recognizing all eight emotions as well as differences in recognizing basic and complex emotions.

Methods

Research Design

The nature of the study is a descriptive survey. The population of the study consists of learners in the early childhood stage having an age group of 3-6 years studying in public sector schools of twin cities Rawalpindi and Islamabad, Pakistan. The sample of the study was derived from 15 public sector schools, seven from Rawalpindi city and eight from Islamabad. A stratified disproportionate random sampling technique was used to derive the sample from both strata. And a sample of learners (n = 209), boys (n= 81; 38.8%) and Girls (n = 128; 61.2%) in the early childhood stage having age range 3-6 years, with mean age and standard deviation (M = 5.33, SD = 0.74 with Min = 3 and Max = 6 years) studying in the public sector schools of twin cities Rawalpindi (n = 105; 49.8%) and Islamabad (n = 106; 50.2 %) were selected.

Instrument

For data collection cue cards representing eight different basic as well as complex emotions based on (happy, sad, angry, scared, excited, jealous, embarrassed, and proud) were presented to the learners. For the emotions recognition task, four different emojis representing different emotions through facial expressions were displayed in the same sequence for all participants against each emotion. Then a verbal description of each emotion by using short stories with particular emotion words was provided. For example, for happy emotion, the two storylines are (You have a birthday, your friend brought a beautiful gift for you, and you feel very happy/ Your mother has brought the toy you wished for, and you feel very happy. The second is offered if the learner show delay in response). Then students were directed to select a card that depict that particular emotion. For the basic emotions, recognition task four basic emotions were displayed to the research participants. And for the complex emotions recognition task both basic and complex emotions cards total of four against each emotion were displayed to the participants. For a better understanding of the participants' dual modes of language, Urdu and English were used so that participants can easily comprehend the information.

Data collection

The data were collected from 16 different schools in Rawalpindi and Islamabad, Pakistan. Before data collection, the researcher has taken permission from the Rawalpindi Directorate of Education and the Federal Directorate of Education. The researcher has collected survey data along with her research assistant. Before this consent was taken from the participant's parents along with the willingness of the participants. Face-to-face semi-structured interviews were conducted so that participants can fully understand the given information.

Data Analysis

The data were analysed by using the statistical software SPSS 24. The frequency tabulation along with percentage was carried out to assemble the data for each emotion. Then, further classified on the basis of correct and incorrect response that results in binary data ranging between 0-1. Moreover, to measure learners' ability to recognize each emotion under study binomial one sample test was applied. The value of test proportion is 0.50 in which both of the categories (correct and incorrect) have an equal chance to be selected, p less than 0.05 indicates that there is a difference in the mean proportion of both categories on the selected emotion. Further, frequency, percentages, the mean, and standard deviation were calculated to find out the accuracy level of participants' responses after taking the sum of all emotions. The sum score yielded the range of correct responses from 0-8. To make the decision on the hypothesis of the study that children at the early childhood stage of development are able to recognize all emotions on the sum of all emotion data following ranges are used 0-1= Poor, 2-3 = fair (needs improvement), 4-5= Good, 6-7= Very Good and 8= Excellent.

Further, to identify the level of accuracy in identifying the basic and complex emotions firstly the sum score was taken. To compute basic emotions the sum of emotions happy, sad, angry, and fear was taken. And to compute complex emotions the sum of excited, jealous, proud, and embarrassed was calculated. The data ranges between 0-4 for both variables. Then again frequency and percentages were applied to find out the accuracy level of participants' responses to both variables. The judgment was made on the basis of the following criteria zero score means learners are not able to recognize any emotion, they are poor at recognizing emotions, one (1) score means that they have only recognized one emotion out of four it illustrates their skill is not developed yet and they needs improvement, two score means that they have a fair amount of knowledge but still not sufficient yet, three means they are good in the recognizing skill and four means they are very good in recognizing emotion (0.00 = Poor, 1= Needs Improvement, 2= Satisfactory or Fair, 3= Good and 4= Very Good).

Moreover, to investigate the study's main claim that learners' ability to recognize emotions are still emerging during early childhood. The emotions recognition score was tested against, a mean score test value equal to 8 which is a maximum total emotions score. For basic and complex emotions the value is 4. Furthermore, to test the last hypothesis and objective for gender differences independent t-test was applied.

Results

Objective 1: To find out the level of accuracy in recognizing emotions (each and overall) by early childhood learners.

Table 1: Emotion recognition: Emotion Happy

Happy						
	Descriptive				Binomial One sample	
	f	%	M	SD	Sig.	Decision
Angry	4	1.9	0.93	0.251	0.000	Reject the null hypothesis
Happy	195	93.3				
Sad	3	1.4				
Scared	7	3.3				
Incorrect	14	6.7				
Correct	195	93.3				
Total	209	100.0				

Table no. 1 shows the results of emotion recognition: emotion happy by learners in early childhood. The accuracy rate of the correct response by early childhood learners is 195 (93%) and the incorrect response is 14 (6.7%) with mean value and Std. deviation ($M = 0.93$; $SD = 0.251$). The major responses fall in the correct category. While most of the learners incorrectly select scared 7 (3.3%), then followed by angry 4 (1.9%) emotions. The binomial one-sample test is found to be statistically significant $p < 0.05$ that means we can say that the mean proportion of learners in selecting correct response happy is high than the test value.

Table 2: Emotions recognition: Emotion Sad

Sad						
	Descriptive				Binomial One sample	
	f	%	M	SD	Sig.	Decision
Angry	34	16.3	0.53	0.501	0.489	Retain the null hypothesis
Happy	5	2.4				
Sad	110	52.6				
Scared	60	28.7				
Total	209	100.0				
Incorrect	99	47.4				
Correct	110	52.6				
Total	209	100.0				

Table 2 shows the results of emotion recognition: emotion sad by learners in early childhood. The accuracy rate of the correct response by early childhood learners is 110 (52.6) and the incorrect response is 99 (47.4%) with mean value and Std. deviation ($M = 0.53$; $SD = 0.501$). The major responses fall in the correct category. While most of the learners incorrectly select scared 60 (28.7%), then followed by angry 34 (16.3%). The binomial one sample test is not found statistically significant as $p > 0.05$ which means we can say that the mean proportion of learners in selecting correct and incorrect responses is equal.

Table 3: Emotions Recognition: Emotion Angry

Angry						
	Descriptive				Binomial One sample	
	f	%	M	SD	Sig.	Decision

Angry	135	64.6	0.65	0.479	0.000	Reject the null hypothesis
Happy	8	3.8				
Sad	13	6.2				
Scared	53	25.4				
Total	209	100.0				
Incorrect	74	35.4				
Correct	135	64.6				
Total	209	100.0				

Table 3 shows the results of emotion recognition: emotion anger by learners in early childhood. The accuracy rate of the correct response by early childhood learners is 135 (64.6%) and the incorrect response is 74 (35.4%) with mean value and Std. deviation ($M = 0.65$; $SD = 0.479$). The major responses fall in the correct category. While most of the learners incorrectly select scared 53 (25.4%), then followed by sad 13 (6.2%). The binomial one-sample test is found to be statistically significant $p < 0.05$ that means we can say that the mean proportion of learners in selecting correct response angry is high the than test value.

Table 4: Emotions Recognition: Emotion Scared

Scared						
	Descriptive			Binomial One sample		
	f	%	M	SD	Sig.	Decision
Angry	21	10.0	0.62	0.486	0.001	Reject the null hypothesis
Happy	9	4.3				
Sad	49	23.4				
Scared	130	62.2				
Total	209	100.0				
Incorrect	79	37.8				
Correct	130	62.2				
Total	209	100.0				

Table 4 shows the results of emotion recognition: emotion scared/afraid by learners in early childhood. The accuracy rate of the correct response by early childhood learners is 130 (62.2%) and the incorrect response is 79 (37.8%) with mean value and Std. deviation ($M = 0.62$; $SD = 0.486$). The major responses fall in the correct category. While most of the learners incorrectly select sad 49 (23.4%), then followed by angry 21 (10%). The binomial one-sample test is found to be statistically significant $p < 0.05$ and equal to 0.001 which means we can say that the mean proportion of learners in selecting the correct response scared is high than the test value.

Table 5: Emotions Recognition: Emotion Excited

Excited		
	Descriptive	Binomial One sample

	F	%	M	SD	Sig.	Decision
Angry	5	2.4	0.73	0.444	0.000	Reject the null hypothesis
Excited	153	73.2				
Happy	41	19.6				
Sad	10	4.8				
Total	209	100.0				
Incorrect	56	26.8				
Correct	153	73.2				
Total	209	100.0				

Table 5 shows the results of emotion recognition: emotion excited by learners in early childhood. The accuracy rate of the correct response by early childhood learners is 153 (73.2%) and the incorrect response is 56 (26.8%) with the mean value and Std. deviation (M = 0.73; SD = 0.44). The major responses fall in the correct category. While most of the learners incorrectly select happy 41 (19.6%), then followed by sad 10 (4.8%). The Binomial one-sample test is found to be statistically significant $p < 0.05$ that means we can say that the mean proportion of learners in selecting correct response excited is high than the test value.

Table 6: Emotions Recognition: Emotion Jealous

Jealous						
	Descriptive			Binomial One sample		
	f	%	M	SD	Sig.	Decision
Angry	26	12.4	0.60	0.491	0.006	Reject the null hypothesis
Embarrassed	31	14.8				
Jealous	125	59.8				
Sad	27	12.9				
Total	209	100.0				
Incorrect	84	40.2				
Correct	125	59.8				
Total	209	100.0				

Table 6 shows the results of emotion recognition: emotion jealousy by learners in early le childhood. The accuracy rate of the correct response by early childhood learners is 125 (59.8%) and the incorrect response is 84 (40.2%) with mean value and Std. deviation (M = 0.60; SD = 0.491). The major responses fall in the correct category. While most of the learners incorrectly select scared 7 (3.3%), then followed by angry 4 (1.9%). The binomial one-sample test is found to be statistically significant $p < 0.05$ that means we can say that the mean proportion of learners in selecting correct response jealous is high than the test value.

Table 7: Emotions Recognition: Emotion Embarrassed

Embarrassed						
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	Descriptive				Sig.	Binomial One sample
	F	%	M	SD		Decision
Angry	25	12.0	0.41	0.493	0.013	Reject the null hypothesis
Embarrassed	86	41.1				
Jealous	66	31.6				
Sad	32	15.3				
Total	209	100.0				
Incorrect	123	58.9				
Correct	86	41.1				
Total	209	100.0				

Table 7 shows the results of emotion recognition: emotion embarrassment or the feeling of being embarrassed by learners in early childhood. The accuracy rate of the correct response by early childhood learners is 86 (41.1%) and the incorrect response is 123 (58.9%) with mean value and Std. deviation (M = 0.41; SD = 0.493). The major responses fall in the incorrect category. While most of the learners incorrectly select jealous 66 (31.6%), then followed by sad 32 (15.3%), and angry 25 (12%). The binomial one-sample test is found to be statistically significant at $p < 0.05$ that means we can say that the mean proportion of learners in selecting any response is not equal, in this case, the results indicate that the chances of selecting an incorrect response are high.

Table 8: Emotions Recognition: Emotion Proud

	Proud					Binomial One sample Decision
	Descriptive		M	SD	Sig.	
	f	%				
Angry	32	15.3	0.58	0.494	0.019	Reject the null hypothesis
Embarrassed	25	12.0				
Jealous	30	14.4				
Proud	122	58.4				
Total	209	100.0				
Incorrect	87	41.6				
Correct	122	58.4				
Total	209	100.0				

Table 8 shows the results of emotion recognition: emotion feeling pride by learners in early childhood. The accuracy rate of the correct response by early childhood learners is 122 (58.4%) and the incorrect response is 87 (41.6%) with the mean value and Std. deviation (M = 0.58; SD = 0.494). The major responses fall in the correct category. While most of the learners incorrectly select angry 32 (15.3%), then followed by jealous 15.3 (14.4%). The binomial one-sample test is found to be statistically significant $p < 0.05$ that means we can say that the mean proportion of learners in selecting correct response proud is high than the test value.

Table 9: Emotions Recognition: Total Emotions Score

Total Emotions Score											
One-Sample Test (Test Value = 8)											
	f	%	C. %	M	SD	t	df	Sig.	M. diff.	lower	Upper
0.00	1	0.5	0.5	5.05	1.71	-24.91	208	0.000	-2.94	-3.18	-2.71
1.00	5	2.4	2.9								
2.00	7	3.3	6.2								
3.00	22	10.5	16.7								
4.00	42	20.1	36.8								
5.00	53	25.4	62.2								
6.00	35	16.7	78.9								
7.00	24	11.5	90.4								
8.00	20	9.6	100.0								
Total	209	100.0									

Table 9 represents the early childhood learner's total score of emotion recognition. In which the total score ranged between 0.00-8.00. Frequencies and percentages are taken against each score to find out the total accuracy score of learners' knowledge about emotions along with the mean score. Moreover, the mean value is calculated to make judgments about the learners' knowledge of emotion. There is only one learner who have not recognized any emotion, 5 (2.4%) learners recognize only one emotion, 7 (3.3%) learners recognize two emotions, 22 (10.5%) learners recognize three emotions, 42 (20.1%) learners recognize four emotions, 53 (25.4%) learners recognize five emotions, 35 (16.7%) learners recognize six emotions, 24 (11.5%) learners recognize seven emotions and 20 (9.6%) learners recognizes all of the eight emotions. The highest frequency is 53 (25%) against recognizing five emotions followed by 42 (20.1%) against recognizing four emotions. Moreover, 63.2% of learners have a good to excellent ability to recognize emotions. In addition, the mean value ($M = 5.052$; $SD = 1.710$) depicts that it is approximately 5 slightly higher than 5 but low than 6 so it falls in category 4-5= Good. That means most of the study's participants are able to recognize up to 5 emotions easily. Emotions score is statistically significantly, $t(208) = -24.91$, $p = 0.000$. Though emotions score was statistically lower by -2.94 (95% CI, -3.18 to -2.71) than the normal emotions score of 8.

The results of table no1 to table no 08 reveal that learners can identify all emotions except emotions sad (equal chance to select correct or incorrect option) and embarrassment (greater chance to select incorrect option). While table no. 09 tells that the null hypothesis is rejected therefore we accept the alternate hypothesis that states there is a significant difference between means.

Objective 2

To identify the level of accuracy in recognizing basic and complex emotions by early childhood learners.

Table 10: Emotions Recognition: Accuracy level of Basic and Complex Emotion

Score	Basic Emotions (test value = 4)					Complex Emotions (test value = 4)				
	f	%	t	df	Sig.	f	%	t	df	Sig.
0	6	2.9	-17.51	208	0.000	13	6.2	-21.098	208	0.000

1	21	10.0			35	16.7				
2	52	24.9			72	34.4				
3	75	35.9			49	23.4				
4	55	26.3			40	19.1				
Total	209	100	Interval of the			209	100	Interval of the		
M	2.727		M. diff.	upper	Lower	M	2.325	M. diff.	lower	upper
SD	1.050		-1.27	-1.42	-1.13	SD	1.147	-1.67	-1.83	-1.52

Table 10 demonstrated the results of learners' ability to recognize basic and complex emotions accurately. In the table accuracy score for recognizing emotions are ranging 0 to 4. There are 6 (2.9%) learners who are not able to recognize basic emotions, 21 (10%) learners recognize one basic emotion, 52 (24.9%) learners recognize two basic emotions, 75 (35.9%) learners recognize three basic emotions, and 55(26.3%) learners recognize four basic emotions. Moreover, the highest frequency 75 (35.9%) falls in accuracy score 3 followed by 55 (26.3%) in accuracy score 4. This indicates that learners have good knowledge about basic emotions and are able to recognize them. Mean value ($M = 2.727$; $SD = 1.050$) also indicates that near about accuracy score 3.

The next column shows the data about complex emotions. There are 13 (6.2%) learners who are not able to recognize complex emotions, 35 (16.7%) learners recognize one complex emotion, 72(34.4%) learners recognize two complex emotions, 49 (23.4%) learners recognize three complex emotions, and 40 (19.1%) learners recognize four complex emotions. Moreover, the highest frequency 72 (34.4%) falls in accuracy score 2 followed by 49 (23.4%) in accuracy score 3. The mean value ($M = 2.325$; $SD = 1.147$) indicates that the learners have a fair knowledge of complex emotions.

Accuracy of identifying the basic emotions score is statistically significantly different, $t(208) = -17.51$, $p = 0.000$. Emotions score was statistically lower by -1.27 (95% CI, -1.42 to -1.13) and accuracy of identifying the complex emotions score is statistically significantly different, $t(208) = -21.098$, $p = 0.000$. Emotions score was statistically lower by -1.67 (95% CI, -1.83 to -1.52).

Based on the results of tables no. 9 & 10, it is revealed that the early childhood learners have a significant knowledge to recognize emotions so H_1 is accepted.

Objective 3: To compare the gender differences in recognizing all eight emotions as well as differences in recognizing basic and complex emotions.

Table 11: Emotions Recognition: Gender Differences in All Emotions

Independent Samples Test: Gender Differences in All Emotions										
					Levene's Test for Equality of Variances		t-test for Equality of Means			
					F	Sig.	t	df	Sig. (2-tailed)	
Happy		G	N	M	SD	3.170	0.076	-0.891	207	0.374
		Boys	81	0.91	0.283					

	Equal variances assumed	Girls	128	0.95	0.228					
Sad	Equal variances assumed	Boys	81	0.51	0.503	0.461	0.498	-0.462	207	0.645
		Girls	128	0.54	0.500					
Anger	Equal variances assumed	Boys	81	0.67	0.474	1.030	0.311	0.497	207	0.620
		Girls	128	0.63	0.484					
Scared	Equal variances assumed	Boys	81	0.63	0.486	0.132	0.717	0.180	207	0.857
		Girls	128	0.62	0.488					
Excited	Equal variances assumed	Boys	81	0.70	0.459	2.059	0.153	-0.734	207	0.464
		Girls	128	0.75	0.435					
Jealous	Equal variances assumed	Boys	81	0.58	0.497	0.637	0.426	-0.417	207	0.677
		Girls	128	0.61	0.490					
Embarrassed	Equal variances not assumed	Boys	81	0.35	0.479	9.484	0.002	-1.554	207	0.122
		Girls	128	0.45	0.500					
Proud	Equal variances assumed	Boys	81	0.53	0.502	3.860	0.051	-1.232	207	0.219
		Girls	128	0.62	0.488					

Table 11 shows the results of the gender differences in recognizing all emotions. For happy emotion levene's test for equality of variance is found insignificant ($p > 0.05$). Therefore, equal variance is assumed. On average, girls have greater knowledge to recognizing basic emotion happy ($M = 0.95$; $SD = 0.228$), than to boys ($M = 0.91$; $SD = 0.283$) but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = -0.891$, $p > 0.05$.

Next is the sad emotion, levene's test for equality of variance is found insignificant ($p > 0.05$). Therefore, equal variance is assumed. On average, girls have greater knowledge to recognizing basic emotion sad ($M = 0.54$; $SD = 0.500$), than to boys ($M = 0.51$; $SD = 0.503$), but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = -0.462$, $p > 0.05$.

Next is the anger emotion, levene's test for equality of variance is found insignificant ($p > 0.05$). Therefore, equal variance is assumed. On average, boys have greater knowledge to recognizing basic emotion anger ($M = 0.67$; $SD = 0.474$), as compared to girls ($M = 0.63$; $SD = 0.484$), but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = 0.497$, $p > 0.05$.

Next is the scared emotion, levene's test for equality of variance is found insignificant ($p > 0.05$). Therefore, equal variance is assumed. On average, boys have greater knowledge to recognizing basic

emotion sacred ($M = 0.63$; $SD = 0.486$), as compared to girls ($M = 0.62$; $SD = 0.488$), but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = 0.180$, $p > 0.05$.

Next is the excited emotion, levene's test for equality of variance is found insignificant ($p > 0.05$). Therefore, equal variance is assumed. On average, girls have greater knowledge to recognizing basic emotion excited ($M = 0.75$; $SD = 0.435$), than to boys ($M = 0.70$; $SD = 0.459$), but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = -0.734$, $p > 0.05$.

Next is the jealous emotion, levene's test for equality of variance is found insignificant ($p > 0.05$). Therefore, equal variance is assumed. On average, girls have greater knowledge to recognizing basic emotion jealous ($M = 0.61$; $SD = 0.490$), than to boys ($M = 0.58$; $SD = 0.497$), but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = -0.417$, $p > 0.05$.

Next is the embarrassed emotion, levene's test for equality of variance is found insignificant ($p < 0.05$). Therefore, equal variance is not assumed. On average, girls have greater knowledge to recognizing basic emotion jealous ($M = 0.45$; $SD = 0.500$), than to boys ($M = 0.35$; $SD = 0.479$), but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = -1.554$, $p > 0.05$.

Next is the embarrassed emotion, levene's test for equality of variance is found insignificant ($p > 0.05$). Therefore, equal variance is assumed. On average, girls have greater knowledge to recognizing basic emotion embarrassed ($M = 0.62$; $SD = 0.488$), than to boys ($M = 0.53$; $SD = 0.502$), but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = 1.232$, $p > 0.05$.

On the basis of the results of gender differences in all emotions, it is stated that gender differences do not exist in recognizing all emotions under study.

Table 12: Emotions Recognition: Gender Differences on Basic and Complex Emotions.

Independent Samples Test: Gender Differences on Basic and Complex Emotions										
						Levene's Test for Equality of Variances		t-test for Equality of Means		
		G	N	M	SD	F	Sig.	t	df	Sig. (2- tailed)
Basic Emotions	Equal variances assumed	Boy	81	2.71	1.086	0.000	0.990	-0.123	207	0.903
				6						
		Girl	128	2.73	1.031					
				4						

Complex Emotions	Equal variances assumed	Boy	81	2.16	1.156	0.495	0.483	-1.659	207	0.099
		Girl	128	2.42	1.134					
				1						
				9						

Table 12 shows the results of the gender differences in recognizing basic and complex emotions. The upper row represents the basic emotions by using equal variance assumed p-value of Levene's test for equality of variance is found insignificant ($P > 0.05$). On average, girls have greater knowledge of recognizing basic emotion ($M = 2.734$; $SD = 1.031$), than to boys ($M = 2.71$; $SD = 1.031$) but the difference is too small. Moreover, t-test reveals that the difference is found statistically insignificant $t(207) = -0.123$, $p > 0.05$. Complex emotions also show the same pattern equal variance is assumed as p is greater than 0.05. On average, girls have more developed understanding of complex emotion ($M = 2.429$; $SD = 1.134$), than to boys ($M = 2.161$; $SD = 1.156$) but the difference here is also too small. Moreover, t-test also reveals that the difference is found statistically insignificant $t(207) = -0.1659$, $p > 0.05$. From the result of the above table, it is depicted that there is no gender difference in recognizing basic as well as complex emotions.

On the basis of the results of tables no. 11 and 12, the null hypothesis H_{02} is accepted and H_2 hypothesis is rejected and it is stated that there are no gender differences among early childhood learners in recognizing all emotions under study as well as among them in their knowledge about recognizing basic and complex emotions.

Findings

Based on the study's result following findings have appeared:

1. Learners have mostly selected the correct response category except for embarrassment. In which the learners show a greater probability of selecting an incorrect response. Most of the learners mixed it with the emotion of jealous and sad.
2. Sad emotion has an equal proportion of selecting a correct and incorrect response. Most of the learners mixed the scared emotion with the sad emotion.
3. The result also reveals that the emotion happy is the easiest one to recognize while embarrassment is the most difficult one.
4. On the overall emotions recognition task learners have good knowledge about emotions.
5. Moreover, learners have a good ability to recognize basic emotions. While on complex emotion recognition tasks their ability is fair.
6. On average emotions recognition ability task girls have a greater ability to recognize six emotions. While emotions of sad and anger were better recognized by boys. Moreover, the results were found statistically insignificant. So, there is no significant difference between the emotions recognition task by boys and girls.
7. Similarly, on basic and complex emotions ability tasks on average girls have a greater ability to recognize emotions. However, the difference is found statically insignificant. So, there is no significant difference between the emotions recognition task by boys and girls on basic and complex emotions.
8. Lastly, on the basis of results it also revealed that overall students have sufficient knowledge about emotions but their ability is still developing (especially on complex emotions tasks).

Discussion

Through the findings of the research, it is found that happy emotion is the easiest emotion to recognize by early childhood learners. The study's finding is in line with the previous researchers (Denham, 1998; Mayer & Salovey, 1997) as compared to negative emotions (Bullock & Russell, 1985; Camras & Allison, 1985). Moreover, error frequencies show that early childhood learners have a rare possibility of getting confused in positive emotion happy with other negative emotions. On the other hand in negative emotions recognition tasks learners have a greater possibility of error and getting confused with other negative emotions. In literature, fear is found the most difficult basic emotion (Broady & Harrison, 1987), but the present study's result is in contrast that sad is found difficult to identify by the learners.

Results depict that excitement is the easiest one to identify in complex emotions. While embarrassment emotion is the most difficult to recognize in complex emotions. The reason may be associated with the emotional and behavioural reaction that learners feel and observe in others related to it. As in the early childhood stage, a child thinks about his or her action of error as a threat to their self-worth and feels insulted. The answer may lay in the socio-cultural context also where the reactions of others to a child's emotional experience affect the child's emotional reaction. Or maybe due to the reason that they have not fully mastered to express and recognize emotions in themselves and also in others. For example, in the storyline of embarrassment, the learner slips in front of class fellows and falls. In this scenario, some of the learners sit quietly his/her fellows may think that he/she becomes sad, and some of them start weeping due to embarrassment. While others show aggressive responses. In the second scenario, in which the learner brings a glass of water for the guest that spilled on the floor. Water glass gets broken, two kinds of emotional responses can be observed the feeling of embarrassment and threat to the self-worth or a fear of the mother to be scolded by her due to the damage or loss. Such kinds of situations sometimes allow learners to experience mixed emotions (more than one emotion at the same time) making them difficult to judge their present emotional state and the behavioural reaction associated with them. Such kinds of mixed emotional experiences may be the one reason for wrong judgment, but correct emotional valance in case of any complex negative and positive emotion.

We might also observe from the data above that though the learners are unable to select the correct emotion on complex emotion recognition tasks they still mostly select the same Valence. The same is found in the pattern of the emotion excited which is positive emotion the learners who are unable to select the correct response have selected the correct valence of emotion positive "happy". The results support the previous trend found in the literature that children under the age of seven, assimilate complex emotions to a similar-valenced basic emotion (Russell & Paris 1994; Bosacki & Moore 2004; Widen & Russell 2010). Moreover, the findings of the study also depict that the easiest ones for the learners to recognize are positive emotions is in line with the literature (Sarrani et al., 2006).

Overall, on the basis of the findings of the sum score of emotions recognition we can say that in the emotions recognition task, learners have good knowledge about emotions. Studies on young pre-schoolers reported that they are proficient at emotion expression recognition skills (Strand, Downs, & Barbosa-Leiker, 2016). But in the present research, on complex emotion recognition tasks, the learner's ability is found fair. Initial investigation on young learners stated that young children have faced difficulty in understanding complex emotions (Pieng, & Okamoto, 2019). This means learners need improvement the reason may be this, the basic emotions emerged early in life, and complex emotions after that so that they are good on basic emotions recognition tasks but are fair at complex emotions recognition tasks. So, it can

be assumed that their ability to recognize emotions is under the developmental stage. Because this essential skill improves with the age (Vicari et al., 2000; Herba & Phillips, 2004; Rodger et al., 2015; Grosbras et al., 2018).

Moreover, on the average mean score of the emotions recognition ability task, girls have a greater ability to recognize six emotions. While emotions of sad and anger were better recognized by boys. But the result of gender differences in recognizing emotion is statistically found insignificant. The result is in accordance with previous studies (Navarro et al., 2002) and is in contrast to that reports girls perform better (Cutting & Dunn, 1999; Parent et al., 1999; Vargas & Vélez, 2003; Bosacki & Moore, 2004).

Conclusions

On the basis of findings and discussions, it is concluded that the learners in the early childhood age have an adequate ability to recognize emotions. Though at this stage of life they are not fully competent in recognizing emotion as their skills are emerging. Moreover, there is no gender difference in emotions recognition ability of boys and girls in the early childhood stage. Therefore, it is recommended that context-based knowledge of emotions should be provided so they can learn the essential skill of perspective-taking. That will further facilitate them to master various social-emotional skills such as self-regulation, problem-solving, empathy, etc. In addition, a clear and differentiated understanding of complex emotions should be inculcated among learners. In this regard, various school-based programs on social-emotional competencies and emotional wellbeing can be introduced at the preschool level.

References

- Baron-Cohen, S., Golan, O., Wheelwright, S., Granader, Y., & Hill, J. (2010). Emotion word comprehension from 4 to 16 years old: a developmental survey. *Frontiers in evolutionary neuroscience*, 2, 109. doi: 10.3389/fnevo.2010.00109.
- Bosacki, S. L., & Moore, C. (2004). Preschoolers' understanding of simple and complex emotions: Links with gender and language. *Sex roles*, 50(9), 659-675.
- Bretherton, I., Fritz, J., Zahn-Waxler, C., & Ridgeway, D. (1986). Learning to talk about emotions: A functionalist perspective. *Child Development*, 57, 529-548.
- Brody, L. R., & Harrison, R. H. (1987). Developmental changes in children's abilities to match and label emotionally laden situations. *Motivation and Emotion*, 11(4), 347-365.
- Bullock, M., & Russell, J. A. (1985). Further evidence on preschoolers' interpretation of facial expressions. *International Journal of Behavioral Development*, 8(1), 15-38.
- Campbell, S. B. (2002). *Behavior problems in preschool children: Clinical and developmental issues*. Guilford Press.
- Camras, L. A., & Allison, K. (1985). Children's understanding of emotional facial expressions and verbal labels. *Journal of nonverbal Behavior*, 9(2), 84-94.
- Camras, L. A., Ribordy, S. C., Spaccarelli, S. A., & Stefani, R. (1986). Emotion recognition and production by abused children and mothers. Paper presented at the meeting of the American Psychological Association, Washington, DC.

- Ceschi, G., & Scherer, K. (2003). Children's ability to control the facial expression of laughter and smiling: Knowledge and behaviour. *Cognition and Emotion*, 17(3), 385-411.
- Ciarrochi, J., Scott, G., Deane, F. P., & Heaven, P. C. (2003). Relations between social and emotional competence and mental health: A construct validation study. *Personality and Individual Differences*, 35(8), 1947-1963.
- Cummings, A. J. (2009). How mood affects children's recognition of others' emotions (Doctoral dissertation, University of Nevada, Las Vegas).
- Cutting, A., & Dunn, J. (1999). Theory of mind, emotion understanding, language and family background: Individual differences and inter-relations. *Child Development*, 70, 853-865.
- Dashiell, J. F. (1927). A new method of measuring reactions to facial expression of emotion. *Psychological Bulletin*, 24, 174-175.
- Denham, S. A. (1986). Social cognition, prosocial behavior, and emotion in preschoolers: Contextual validation. *Child Development*, 57, 194–201. doi: 10.1111/j.1467-8624.1986.tb00020.x
- Denham, S. A. (1998). Understanding of emotions. In *Emotional Development in Young Children* (pp. 58-102). New York: Guilford Press.
- Denham, S. A. (2006). Social-Emotional Competence as Support for School Readiness: What Is It and How Do We Assess It? *Early Education and Development*, 17(1), 57-89. https://doi.org/10.1207/s15566935eed1701_4
- Denham, S. A., & Burton, R. (2003). *Social and emotional prevention and intervention programming for preschoolers*. New York: Kluwer Academic/Plenum.
- Denham, S. A., Bassett, H. H., Way, E., Mincic, M., Zinsler, K., & Graling, K. (2012). Preschoolers' emotion knowledge: Self-regulatory foundations, and predictions of early school success. *Cognition & emotion*, 26(4), 667-679. doi: 10.1080/02699931.2011.602049.
- Dunn, J., Bretherton, I., & Munn, P. (1987). Conversations about feeling states between mothers and their young children. *Developmental psychology*, 23(1), 132–139.
- Ekman, P. (1992). An argument for basic emotions. *Cognition & emotion*, 6(3-4), 169-200. doi: 10.1080/02699939208411068
- Fabes, R. A., Eisenberg, N., McCormick, S. E., & Wilson, M. S. (1988). Young children's appraisals of others' spontaneous emotional reactions. *Developmental Psychology*, 27, 858-866.
- Felleman, E. S., Carlson, C. R., Barden, R. C., Rosenberg, L., & Masters, J. C. (1983). Children's and adults' recognition of spontaneous and posed emotional expressions in young children. *Developmental Psychology*, 19(3), 405-413.
- Garner, P. W., Jones, D. C., Gaddy, G., & Rennie, K. M. (1997). Low-income mothers' conversations about emotions and their children's emotional competence. *Social Development*, 6(1), 37-52.
- Goleman D. (1995). *Inteligența emoțională*. Bucuresti, Editura Curtea Veche Publishing.

- Green, J., & Ekman, P. (1973). Age and the recognition of facial expressions of emotion. Unpublished manuscript, University of California, San Francisco.
- Griffiths, P. E (1997). *What Emotions Really Are: The Problem of Psychological Categories*, Chicago y Londres.: University of Chicago Press.
- Griffiths, S., Goh, S. K. Y., Norbury, C. F. & the SCALES team. (2020). Early language competence, but not general cognitive ability, predicts children's recognition of emotion from facial and vocal cues. *PeerJ*, 8, e9118. <https://doi.org/10.7717/peerj.9118>
- Grosbras, M. H., Ross, P. D., & Belin, P. (2018). Categorical emotion recognition from voice improves during childhood and adolescence. *Scientific reports*, 8(1), 1-11. doi: 10.1038/s41598-018-32868-3.
- Gu, S., Wang, F., Yuan, T., Guo, B., & Huang, J. H. (2015). Differentiation of primary emotions through neuromodulators: review of literature. *International Journal of Neurology Research*, 1(2), 43-50. doi: 10.17554/j.issn.2313-5611.2015.01.19
- Gu, S., Wang, W., Wang, F., & Huang, J. H. (2016). Neuromodulator and emotion biomarker for stress induced mental disorders. *Neural plasticity*, 2016. doi: 10.1155/2016/2609128
- Harris, P. L. (1989). *Children and emotion: The development of psychological understanding*. Basil Blackwell.
- Harris, P. L., Olthof, T., Meerum Terwogt, M., & Hardman, C. E. (1987). Children's knowledge of the situations that provoke emotion. *International Journal of Behavioral Development*, 10(3), 319-343. <https://doi.org/10.1177/016502548701000304>.
- Herba, C., & Phillips, M. (2004). Annotation: Development of facial expression recognition from childhood to adolescence: Behavioural and neurological perspectives. *Journal of Child Psychology and Psychiatry*, 45(7), 1185-1198. doi: 10.1111/j.1469-7610.2004.00316.x.
- Holder, H. B., & Kirkpatrick, S. W. (1991). Interpretation of emotion from facial expressions in children with and without learning disabilities. *Journal of Learning Disabilities*, 24(3), 170-177.
- Izard, C. E. (1971). *The face of emotion*. East Norwalk, CT, US: Appleton-Century-Crofts. 468-482.
- Izard, C. E. (2007). Basic emotions, natural kinds, emotion schemas, and a new paradigm. *Perspectives on psychological science*, 2(3), 260-280.
- Izard, C., Fine, S., Schultz, D., Mostow, A., Ackerman, B., & Youngstrom, E. (2001). Emotion knowledge as a predictor of social behavior and academic competence in children at risk. *Psychological science*, 12(1), 18-23. doi: 10.1111/1467-9280.00304.
- Jack, R. E., Garrod, O. G., & Schyns, P. G. (2014). Dynamic facial expressions of emotion transmit an evolving hierarchy of signals over time. *Current biology*, 24(2), 187-192. doi: 10.1016/j.cub.2013.11.064
- Jack, R. E., Sun, W., Delis, I., Garrod, O. G., & Schyns, P. G. (2016). Four not six: Revealing culturally common facial expressions of emotion. *Journal of Experimental Psychology: General*, 145(6), 708.

- Lewis, M. (2008). The emergence of human emotions. In M. Lewis, J. M. HavilandJones, & L. F. Barrett (Eds.), *Handbook of emotions*, third edition (pp. 304-319). New York, New York: The Guilford Press.
- Markham, R., & Adams, K. (1992). The effect of type of task on children's identification of facial expressions. *Journal of Nonverbal Behavior*, 16(1), 21-39.
- Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence?. In P. Salovey, & D. J. Sluyter (Eds.), *Emotional Development and Emotional Intelligence*. Basic Books, New York, 3, 34.
- Mayer, J.D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. J. Sluyter (Eds.), *Emotional Development and Emotional Intelligence*. New York: BasicBooks.
- Navarro, D., Rey, N., Velasco, I. C., & Pérez, M. (2002). Diferenciación y caracterización del reconocimiento de emociones básicas en niños y niñas. Trabajo de grado para optar al título de psicólogas. Pontificia Universidad Javeriana, Facultad de Psicología (Facality pf Psychology).
- Nowicki, S., & Duke, M. P. (1992). The association of children's nonverbal decoding abilities with their popularity, locus of control, and academic achievement. *The Journal of Genetic Psychology: Research and Theory on Human Development*, 153(4), 385–393. <https://doi.org/10.1080/00221325.1992.10753734>
- Odom, R. D., & Lemond, C. M. (1972). Developmental differences in the perception and production of facial expressions. *Child Development*, 43, 359-369.
- Pânișoară, G., Pânișoară, I. O., & Sandu, C. M. (2015). Comparative study on emotions analysis in students of psychology by gender. *Procedia-Social and Behavioral Sciences*, 180, 1638-1642.
- Parent, S., Normandeau, S., Cossett-Richard, M., & Letarte, M. (1999, April). Preschoolers' emotional competence and social behavior within the family: May gender differences be in the eye of the beholder? Poster presented at the biennial meeting of the Society for Research in Child Development, Albuquerque, NM.
- Pieng, P., & Okamoto, Y. (2019). Promoting young children's understanding of the situations and prosocial responses related to jealousy. *Early Childhood Education Journal*, 47(5), 571-584.
- Ridgeway, D., Waters, E., & Kuczaj, S. A. (1985). Acquisition of emotion-descriptive language: Receptive and productive vocabulary norms for ages 18 months to 6 years. *Developmental Psychology*, 21(5), 901– 908.
- Rodger, H., Vizioli, L., Ouyang, X., & Caldara, R. (2015). Mapping the development of facial expression recognition. *Developmental science*, 18(6), 926-939. doi: 10.1111/desc.12281
- Russell, J. A., & Paris, F. A. (1994). Do children acquire concepts for complex emotions abruptly?. *International Journal of Behavioral Development*, 17(2), 349-365.
- Saarni, C., Campos, J. J., Camras, L. A., & Witherington, D. (2006). Emotional development: Action, communication, and understanding. *Handbook of Child Psychology*. 3, 226-299.

- Schultz, D., Izard, C. E., & Ackerman, B. P. (2000). Children's anger attribution bias: Relations to family environment and social adjustment. *Social Development*, 9(3), 284–301. <https://doi.org/10.1111/1467-9507.00126>
- Sette, S., Spinrad, T. L., & Baumgartner, E. (2017). The relations of preschool children's emotion knowledge and socially appropriate behaviors to peer likability. *International journal of behavioral development*, 41(4), 532-541. doi: 10.1177/0165025416645667.
- Strand, P. S., Downs, A., & Barbosa-Leiker, C. (2016). Does facial expression recognition provide a toehold for the development of emotion understanding?. *Developmental Psychology*, 52(8), 1182.
- Vargas, R. O., & Vélez, C. F. P. (2003). Diferencias de género en el reconocimiento de expresiones faciales emocionales. *Universitas Psychologica*, 2(2), 151-168.
- Vicari, S., Reilly, J. S., Pasqualetti, P., Vizzotto, A., & Caltagirone, C. (2000). Recognition of facial expressions of emotions in school-age children: the intersection of perceptual and semantic categories. *Acta Paediatrica*, 89(7), 836-845.
- Walker, P. M., & Hewstone, M. (2006). A developmental investigation of other-race contact and the own-race face effect. *British Journal of Developmental Psychology*, 24(3), 451-463.
- Walker-Andrews, A. S., & Lennon, E. (1991). Infants' discrimination of vocal expressions: Contributions of auditory and visual information. *Infant Behavior and Development*, 14(2), 131-142.
- Wang, F., & Pereira, A. (2016). Neuromodulation, emotional feelings and affective disorders. *Mens sana monographs*, 14(1), 5–29. doi: 10.4103/0973-1229.154533
- Wellman, H. M., Harris, P. L., Banerjee, M., & Sinclair, A. (1995). Early understanding of emotion: Evidence from natural language. *Cognition & Emotion*, 9(2-3), 117-149.
- Widen, S. C., & Russell, J. A. (2008). Children acquire emotion categories gradually. *Cognitive development*, 23(2), 291-312.
- Widen, S. C., & Russell, J. A. (2010). Children's scripts for social emotions: Causes and consequences are more central than are facial expressions. *British Journal of Developmental Psychology*, 28(3), 565–581. <https://doi.org/10.1348/026151009X457550d>.
- Wilson-Mendenhall, C. D., Barrett, L. F., & Barsalou, L. W. (2013). Neural evidence that human emotions share core affective properties. *Psychological science*, 24(6), 947-956. doi: 10.1177/0956797612464242
- Zheng, Z., Gu, S., Lei, Y., Lu, S., Wang, W., Li, Y., & Wang, F. (2016). Safety needs mediate stressful events induced mental disorders. *Neural plasticity*, 2016. doi: 10.1155/2016/8058093