

**PRESCHOOL TEACHER-CHILD RELATIONSHIP
PATTERNS FOR CHILDREN'S SCHOOL ADJUSTMENT
(The Case of Awassa Town)**

By
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**A Thesis Submitted to the School of Graduate
Studies of Addis Ababa University in Partial
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ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES



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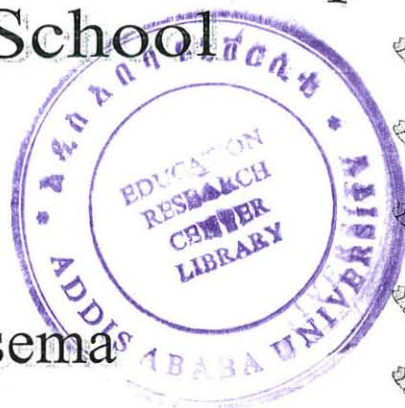
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eSchool Teacher-Child Relationship Patterns for Children's School Adjustment

By
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Samuel Fantye Tessema

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ABSTRACT

Teacher reports of children's relationship, competence and problem behaviors are important sources of information in school psychology. This study examines teacher-child relationships as correlates of children's school adjustment paradigm. There is a significant variation in the children's school adjustment among the relationship Patterns. Kindergarten teacher perceptions of their relationship with children were described in a report measure.

The teacher-child relationship scale (TCRS) and the School Adjustment Scale (SAS) is used to gather data. After assigning scores on the teacher-child relationship scale and the school adjustment scale for 305 research participants, cluster analysis method was used and three cluster solutions were found.

Three patterns of relationships were described: more positively involved, functional average, and negatively involved. Children in the three patterns significantly differ in school adjustment. Children with whom kindergarten teachers reported a positive relationship were better adjusted in school and had warm, close and communicative relationships than those whom the teachers report negative relationships.

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CHAPTER ONE

I. INTRODUCTION

1.1 Background of the Study

The quality of the interaction between teachers and pupil's has been since long, a topic of discussion among educators and others concerned with children's development. It is generally agreed that because so much basic early learning (e.g., language, social competence) occurs through interactive experiences at the childhood stage, hence, the quality of teacher-child interactions contributes substantially to affect that early group care and preschool education of children (Bowman, Donovan,& Burns, 2001).

Many early childhood teachers enter the field with little education beyond high school and minimal specialized education in child development or early childhood education. Researchers have therefore wondered whether the general levels of education, specialized training in early childhood development and education, or both, are related to the quality of teachers' interactions with young children (Phillips, Lande, & Goldberg, 1990). Thus, it is important to know if specialized education in early childhood education is related to teachers' effectiveness on the job.

Teacher-child interactions are most developmentally appropriate when the teacher responds quickly, directly and warmly to children, provides a variety of opportunities to engage in two way communication, and identifies and elaborates on the feelings, interests and activities of children. Teachers who engage in sensitive and responsive interactions with children are more likely to develop

relationships key to children's security, increasing the likelihood that children will explore their environment, giving them more opportunities to learn (Mc Wiliam, Ridely, and Wakely, 2000).

The teacher- child relationship especially in the kindergarten is a potentially valuable target of study in respect to patterns of child behavior, beliefs and feelings previously developed in the context of parent/ mother-child attachment relationship (Pianta, 1994). Experiences with caregivers/parents greatly influence patterns of expectation of self and others and feelings of self worth, trust and motivation that preschoolers' bring to, and enact in relationships with a teacher. Patterns of child-teacher relationships in kindergarten (e.g. conflict, open/close, and dependent) are related both to behavior in the home and are predictive of subsequent school adjustment (Pianta, 1996). Howes and Hamilton (1992) asserted that, during the early school years, teachers may assume a parent surrogate role with the children they teach, and may develop a relationship with the child that has salience for certain developmental outcomes.

1.1.1. Overall Perspective Of Teacher- Child Relationship

Attachment theory proposes that aspects of children's interactions with other persons affect their cognitive, social and emotional competence (Ainsworth, 1978). The theory also underscores the importance of adults' sensitivity to the developing preschools, increasing coordination of affect, cognition and behavior i.e. structuring experience while allowing the child autonomy, and leading him/her to social and cognitive success.

CHAPTER TWO

2. METHOD

2.1 The research participants and sampling

A pilot study which was intended to create a working relationship with the people in the study site and test the relevance of instruments was carried out on sixty children (Boys = 33 and Girls = 27); and three female trained teachers.

The main study was intended to be carried out on 320 kindergarten children of ages between 5 up to 6 years old (Boys = 174 and Girls = 146); and sixteen female trained teachers. The sample group was drawn from eight kindergartens that were selected out of fifteen by simple random sampling specifically by lottery method. Proportional allocation for the two sex group and a simple random sampling technique were utilized to select the children for the study. A mix of approaches was used to assign the teachers in this study; i.e where ever there are more than two teachers in the kindergarten, two were chosen by a simple random draw. When there are only two female trained teachers, both were included in the study. Out of the 320 sampled individuals, the scales were filled and returned for only 305 (i.e boys 169 and girls = 136)

2.2 Instruments

2.2.1 The teacher - child relationship scale (TCRS)

The teacher - child relationship scale of Paint (1992) was applied and used in the study. In a five-point scale, the teacher child relationship scale contains items that show closeness, dependency and conflict relations. A refinement and validation of interims were conducted to make them fit to our culture. A pilot study was conducted in one of the

kindergartens. Three female trained teachers each filled the thirty -one-item scale for twenty children.

The final item selection was made in two ways; i.e computing discrimination index for each item and taking items with a relatively large discrimination index. Moreover, t- test was used to see significant item mean difference between the upper and the lower (27%) groups. Items that significantly differentiated between the groups were selected based on this out of the thirty- one items twenty- one items with ($t \geq 2.25$, at .05 two tailed, df 30) were selected.

2.2.2 The school Adjustment scale (SAS)

The twenty three- item scale of school adjustment was adopted from Barbara (1975). The scale contains items, which indicate the child school readiness, competence in social relations, personal maturity, and conduct problems. Teachers, who filled the teacher - child relationship scale also filled the school adjustment scale for the same children since the two scales were different. Items analysis was carried out on the upper (27%) and the lower (27%) scores. The scale item significantly differentiated between the upper and the lower groups ($t > 14.07$, at .05 two tailed df 30), were the critical t-value is 2.04. Out of the 23 items, 19 were selected for the final study with ($t \geq 2.51$ at .05 two tailed, and df 30).

2.3. Data collection procedure

Translating English - to- Amharic and back to English of both instruments were made before the pilot testing. In the pilot study as well as in the main study; teachers in less than twenty days filed the teacher - child relationship scale and the school adjustment

Bowlby(1989) also maintained that the quality of children's interactions to their caretakers exerts a strong influence on their ability and willingness to explore their environment. Children who are securely related with caretakers presumably embark on exploring their environment with greater assurance than insecurely attached children (Jacobsen, Edeistien&Hofman, 1994).

A secure relationship between child and teachers is seen as not only the basis for child's sense of self-efficacy and social skills, but also of key significance in the development of later successful relationships. The interaction that children have with their teachers is of great importance in determining the quality of their educational and life experiences. Early childhood is a period in which development is sensitive to the influence of relationships and that performance in school may in fact be mediated by social processes embedded in this relationships (Pianta, 1997). Children may judge if a school is a safe and trust worthy place in which they may live and work, they can have the confidence to explore and develop new skills and understandings when they feel safe, cared for and secured; otherwise unproductive if they feel threatened, anxious or uncertain. Like a parent-child relationship, the teacher-child relationship may vary in nature and quality. Some teacher-child relationships can be characterized as close and affectionate, other as distant and formal, still others as confliction (Pianta, 1997).

One of the goals of early childhood education develop strong, positive and realistic self concept and these are greatly influenced by opinions of significant people in their lives. The nature of children's self-concept is dependent on how family members, caregivers and teachers relate to them (Fenny, Christensen& Moravick, 1987).

Kindergarten teachers lay the foundation for children's cognitive, moral, social, emotional and psychological development, and this is a clue for later adjustment to formal school in particular and to the entire life in general. The early childhood teacher controls rewards and punishments in the classroom, evaluate students' performance and maintain control over the class. As it is cited by Shewakena(1997) children are dependent on the teacher in the classroom situation, everything the teacher does influences the attitude of children. The teacher of young children serves as a model for children; his/her personality, the way he/she treats his/her speech, the way he/she talks, the way he/she reacts, gesture, response, attitude and feelings have a decisive influence in children's development.

Entering the kindergarten is a big step for the child. It means leaving his/her familiar home and depending on adults other than his/her parents, finding a place for his/her self in a group of other children of about the same age, there are new toys, different toilet arrangements, a strange play area, he/she meets a variety of responses from other children. He/she must trust the teachers to understand keep himself/herself in his/her stay in the kindergarten.

1.1.2. Preschool Education and Teacher-Child Relation in the Past

As cited by Pankhurst(1974),until the beginning of the 20th century, education in Ethiopia rooted itself in monasteries, abbeys and mosques. The objective was basically religious although some scribes that functioned as secretaries of the aristocracy were also the graduates of those schools.

According to Girma(1967),some of the main features of church school and teacher-student relation presented as follows. The church school is usually one room building in or near the church compound, though sometimes a tree provides

the only shelter. In a typical classroom one finds an old man, usually a priest or “debtera”, seated on a small stool with a long stick beside him and the book of Psalms in his hands, while some thirty pupils, in groups of two or three, sit on the floor before him. The more advanced students teach the less advanced, while the teacher attends the former, but periodically checks on the progress of the smaller children.

As part of the moral instruction, children are also required to give service to their teacher. They learn the virtues of obedience, humility, and respect for their teacher, by fetching wood and water for his household purposes and buying commodities from market place. Children are also expected to kiss their teachers’ feet when entering and leaving the classroom. In return they receive the blessing of their teacher.

1.1.3. The Beginning of Modern Preschool in Ethiopia

Kindergarten education in Ethiopia was introduced ninety years back (Bizuneh, 1983) Nevertheless, there were only 77 kindergartens until 1973. Twenty years later; i.e. in 1993 the number of kindergartens increased to 550; in 1994 this number was raised to 652; and in 1995 it became 678. Moreover in 1998 the number of kindergartens reached to 793. In 1973 the total number enrolled was 7,573 with an average of 98 children per kindergarten, while by 1998 this number increased to 90,321 and the average number of children enrolled has risen to about 115 per kindergarten (MOE, 1998). In 2004 total enrollment of kindergarten children had risen to 138,918 and the number of trained teachers increased to 2968 (MOE, 2004).

Concerning kindergarten teachers training, a beginning was made with the training of 20 young ladies in 1971 at the Ras Desta Community Center in Addis Ababa for six months. This training center moved to Debrezeite in August 1972 and began training kindergarten teachers extending the course to one solid year (Shewakene, 1997).

Besides in 1978 the ministry of education in collaboration with UNICEF opened kindergarten teachers training institute in Addis Ababa, Yekatit12 Secondary School (MOF, 1984). The courses organized in this institute last three months. Similarly, kindergarten teachers training program has been introduced in Dessie Teachers' Training Institute by May 1994 with the training duration of three months.

1.1.4. What are Positive Teacher Child Relationships?

In early childhood settings, each moment that teachers and children interact with one another is an opportunity to develop positive relationship (Bredekamp, S, & Copple, C.1997). Teachers can use a variety of strategies to build positive relationships with children. Teacher behavior such as listening to children, making eye contact with them, and engaging in many one-to-one, face-to-face interaction with young children promote secure teacher-child relationships. talking to children using pleasant, calm voices and simple language, and greeting children warmly when they arrive in the classroom with their parents or from the buses help establish secure relationships between teacher and children (Kontos,1999).

In developing positive teacher-child relationships, it is important to:

- Engage in one-to-one interaction with children.
- Get on the child's level for face-to-face interactions.
- Use a pleasant, calm voice and simple language.
- Provide warm, responsive physical contact
- Follow the child's lead and interest during play
- Help children understand classroom expectation
- Redirect children when they engage in challenging behavior
- Listen to children and encourage them to listen others
- Acknowledge children for their accomplishments and effort.

In general, it is important for teachers to use developmentally and individually appropriate strategies that take into consideration children's differing needs, interests, styles, and abilities.

1.1.5. Why are Positive Teacher-Child Relationships Important?

Research has suggested that teacher-child relationships play a significant role in influencing young children's social and emotional development. In studies of teacher-child relationships, children who had a secure relationship with their preschool teachers demonstrated good peer interactions and positive relationships with teachers and peers in elementary school. On the other hand, children who had insecure relationships with teachers had more difficulty interacting with peers and engaged in more conflict with their teachers (CSEFEL, 2003). In addition research had shown that teachers' interaction styles with children help children build positive and emotionally secure relationships with adults. For instance, teachers' smiling behaviors, affectionate words, and

appropriate physical contact help promote children's positive responses toward teachers (Howes&Hamilton, 1993). Also, children whose teachers showed warmth and respect toward them (e.g., teachers who listened when children talked to them, made eye contact, treated children fairly) developed positive and competent peer relationships. Moreover, children who had secure relationships with their teachers demonstrated lower levels of challenging behaviors and higher levels of competence in school.

Pianta(1995) described patterns of kindergarten teachers perceptions of their relationships with children in clusters of six, i.e. dependent, positively involved, dysfunctional, functional average, angry dependent and uninvolved. Children in these clusters significantly differ in their adjustment to school. In the description, the most problematic were the dysfunctional and angry dependants. These relationship cluster findings of Pianta found to agree with the five-group cluster scheme of children's perceptions of their relationships with teachers such as optimal, disengaged, confused and, deprived found by Lynch and Cicchetti(1992).

On the other hand the finding of Howes and Hamilton (1992) classified teacher-child relationship into three categories: emotionally secure, avoidant and ambivalent. The children in different categories experienced different amounts of sensitivity and involvement. Teachers found to be most sensitive to and most involved with children in the secure category and least sensitive and involved with children in the avoidance category.

Children whose relationship with the teacher fall in the dependent and angry dependent clusters show a mixture of adjustment difficulties; they were reported to have more conduct problems less competent in intellectual functioning, and as

being less tolerant of frustration. Evidently anger, and difficulties in managing it appeared to be a common feature in these children's relationships and adjustment patterns (Pianta 1995).

In Pianta's, finding very high scores on the conflict/ anger marked some teacher child relationships and troubled feeling scales very low scores on the warmth /closeness and open communication scales, and moderate scores on the dependency scale.

1.1.6. Adjustment in the kindergarten

Studies of experimental Pre – school programmers indicate that high quality preschool education has significant long term outcomes, not only for the child but also for the community (Sensini, 1985). In connection to this Welkart's findings in Erick (1991) revealed that:

As young adults, children who attended Kindergarten programme competently Made greater gains in education, employment and social responsibility than similar young adult, who were not competent in the Kindergarten attendance did.

Many teachers in the kindergarten expect children to learn and behave in ways that will facilitate learning, The children are expected to let their speech, dress, morals, behavior be monitored and corrected, and their state of knowledge constantly examined and criticized.

The new experiences which a child is facing every time are more important in influencing his /her adjustment. Entering the kindergarten is a big step for the child. It means leaving his /her familiar home and depending on adults other than his/her parents, finding a place for his/her self in a group of other children of about the same age, having

new toys, different toilet arrangements, a strange play area, he/she meets a variety of responses from the other children.

Children's school adjustment is associated with teachers attributions, interactions with children expectations and attitudes as well as children's feelings about teachers (Entwistle, 1998). When children experience a secure relationship with their teacher, the likelihood of school adjustment increases. Pianta (1991) discussed children's competence and school adjustment to be associated with teacher relationship ratings.

As Howes and Hamilton's (1994) discussion, emotional security and dependency behavior are more clearly differentiated in the preschool period. The emotionally secure preschoolers may seek instrumental assistance when they need help. In contrast, dependent preschoolers frequently seek attention and contact with the teacher, often waiting for help without trying to solve problems on their own, also found to withdraw from the peer group and rely on the teacher to solve problems with peers.

Apparently, kindergarten children in the different teacher child relationship clusters differ in their school adjustment behavior. The dysfunctional and angry dependent groups generally showing more conduct problems and less in cognitive competencies (Pianta, 1995, 1996). Pianta also reported this group to be significantly higher for the learning problem scale than the other groups. Children with uninvolved and positively involved relationships with kindergarten teachers seem displaying more frustration tolerance in the school than children with dysfunctional or angry relationship histories (Pianta, 1995,1996). And also the uninvolved positively involved and the functional relationship groups were rated as having better work habits than the dysfunctional groups, the positively involved groups were found to be better in social skills than the rest.

In summary, teacher-child relationship affects children's school adjustment. although, there are no many researches conducted in the area, the few researches available by Pianta and colleagues used teacher-child relationship scale and school adjustment scale as a method of investigation. The literature points to the need of studying to what depth the teacher-child relationship is related with children's school adjustment in our kindergarten. In addition exploring the typologies of relationships and their differences when seen from the child's school adjustment situation is desirable.

1.2. Objectives of the Study

This research was conducted to describe the typology of relationship patterns of teachers and children, and children's school adjustment in kindergartens of Awassa town. And it attempted to answer the following basic questions:

1. Is there significant variation in the children's school adjustment among the relationship patterns?
2. What types of teacher-child relationship patterns are there in kindergartens?
3. Does the teacher-child relationship pattern significantly different for boys and girls?

1.3. Significance of the study

This study will have a potential value to education policy makers; kindergarten teacher trainers, administrators, teachers, school counselors and parents since the early years of the child are influential in his/her later development.

- The outcome of this study may help kindergarten teachers and administrators to optimize each child's adjustment to their program.
- It may be helpful for school counselors and parents to make the necessary intervention in the child's school adjustment.
- In addition it will serve as a basis for further research development in the area of teacher-child relationship in the kindergarten.

1.4. Operational Definition of Terms

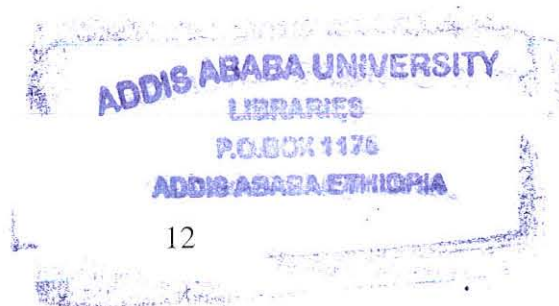
Preschool/ kindergarten – a school for the pre-primary years preceding the first grade between the ages of 4-6.

Preschool Teacher – a trained personnel who teaches in the kindergarten.

Patterns - definite direction, tendency or characteristics; as relationship patterns, behavior patterns, etc.

Relationships – the connection between or among persons on private affairs or they are mode of interactions and expectations.

School adjustment – the extent that a child has the skills and is able to meet the demands and expectations set forth in the school setting, that the child is likely to be in proper position.



1.5. Variables used in the study

i). Dependent variable

-The child's school adjustment score when rated by the kindergarten teacher

ii). Independent variable

-Teacher-child relationship score

scale to avoid the problem of bias and diminishing returns. In the pilot session, three teachers filled both the scale for twenty children each. After improving the instruments for the main study, both scales were filled by sixteen female, trained teachers for twenty children each.

2.4 Data Analysis

After assigning scores on the teacher - child relationship scale and the school adjustment scale for 305 research participants (Boys 169, and Girls 136), cluster analysis method was used and three cluster solutions were found.

A one - way analysis of variance (ANOVA) was performed whether the three groups are equally homogeneous. Moreover, mean differences test of both scores was done for boys and girls.

Pearson product - moment correlation were computed between teacher -child relationship and school adjustment score for all cluster groupings.

Using TUKEY HSD method made posthoc comparison. This method was selected, among others, for caution and its appropriateness for unequal sample size mean comparison (Howell, 1989).

Finally, all differences were tested for statistical significance at the .05 level.

CHAPTER THREE

3.1 RESULTS OF THE STUDY

The results of the study are presented in the following sequence: cluster solutions of the teacher -child relationship, cluster differences in teacher -child relationship, school adjustment differences among the clusters, sex differences in teacher -child relationship and school adjustment, cluster differentiations in subscale scores and types of clusters, and correlations.

3.1.1 Cluster Solution of the Teacher -Child Relationships

The 305 scores of teacher -child relationships were grouped into three cluster solutions with the possible least error variance. The number of observations, means, standard deviations for each cluster solution are in table 1.

Table 1.

Number of observation, means, and standard deviations for the teacher - child relationship score of the three clusters

Cluster case	N	Means	Standard deviation
1	106	92.25	4.71
2	132	78.21	4.39
3	67	62.43	5.37
Total	305		

Table 1 indicates that 106 children scored higher (mean 92.25) than the rest in teacher - child relationship scale and 132 children scored moderately high (mean = 78.21) than the 67 children who scored relatively low (mean = 62.43). A high score in teacher child relationship shows a more positive relationship involvement between the teacher and the child and low score shows vice versa.

Table 2

ANOVA summary Table

Source	SS	df	Ms	F
Between cluster	36974.76	2	18487.38	826.52**
Within cluster	6752.63	302	22.36	
Total	43727.39	304		

**p<.001

Table 2 presents the results of cluster solution of the teacher -child relationship scores. The table shows that the differences between the three -cluster solution are statistically significant. Hence, it indicates that for this sample group, there are three groups of children which have different types of relationships with their teachers.

3.1.2 Paired Cluster Difference in Teacher -Child Relationship

Mean differences test (t-test) was performed to see for differences in teacher -child relationship among the three clusters. All cluster paired mean differences were found to be statistically significant. And the results are shown in table 3.

Table 3**Mean Differences Test (t-test)**

Cluster cases	N	Mean	Mean difference	df	t-value
1	106	92.25	14.04	236	23.76**
2	132	78.21			
1	106	92.25	29.82	171	38.41**
3	67	62.43			
2	132	78.21	15.78	197	22.19**
3	67	62.43			

**p <.001

As indicated in table 3 the cluster differences in teacher -child relationship were statistically significant. Posthoc test of Tukey HSD (see Appendix -G-)also revealed the presence of clear differences among the cluster relationship types since all the three mean differences (clusters 1&3 = 29.82, 2&3 = 15.78, and 1&2=14.04) substantially exceed the HSD value which is 9.94 were the family wise error rate is about .021 (Howell,1987:357)

3.2 School Adjustment Differences Among the Clusters

The research question addressed in this section is whether the children in the different relationship patterns are significantly different in their school adjustment. A similar one way ANOVA similar to that of the teacher -child relationship variable was performed to see significant differences among the three clusters for school adjustment variables. And the result is shown in table 4.

Table 4.

ANOVA Summary Table

Source	ss	df	Ms	F
Between cluster	18110.12	2	9055.06	153.15**
Within cluster	17855.44	302	59.12	
Total	35965.66	304		

**p<.001

Table 4 presents the result of children's school adjustment variation in the three different pattern of relationship. The table shows that the group's difference was statistically significant. This may confirm the presence of teacher -child relationship determination on the child's adjustment in the school environment.

Table 5

Mean Differences Test for the School Adjustment Variable

Cluster cases	N	Mean	Mean Difference	df	t-value
1	106	80.96	9.51	236	10.19**
2	132	71.45			
1	106	80.96	20.92	171	17.18**
3	67	60.04			
2	132	71.45	11.41	197	9.28**
3	67	60.04			

**p>.01

Table 5 presents the cluster differences in school adjustment. As shown in the table, the clusters mean differences were statically significant. Nevertheless, posthoc test of Tukey HSD (see Appendix G) shows the existence of a difference only between cluster one and cluster three (Mean difference = 20.92) where the HSD value is 16.16

3.3 Sex Differences in Teacher -Child Relationship and School Adjustment.

The research question handled in this section is sex difference in teacher -child relationships and the child's school adjustment. Mean differences test (t-test) was performed for both teacher -child relationship and school adjustment variables. Table 6 shows the number of observation, means, and standard deviations of the teacher -child relationship and school adjustment score for boys and girls.(See Appendix -D-) for the distribution of scores for boys and girls.

Table 6.

Number of observations, means, and standard deviation for teacher -child relationship and School Adjustment scores for boys and girls

	sex	N	Mean	Standard Deviation
Teacher - Child Relationship Score (x-scores)	Boy	169	79.35	11.52
	Girl	136	79.97	12.59
School adjustment scores (Y-scores)	Boy	169	71.24	10.93
	Girl	136	73.51	10.71

Table 6 shows that on the average girls as a group scored slightly higher than boys did in both the teacher -child relationship and school adjustment scores.

Table 7

Mean differences test (t-test) for Boys and Girls

Variable	Sex	N	Mean	Mean Difference	df	t-value
Teacher -Child Relationship	Boy	169	79.35	.62	303	-.449**
	Girl	136	79.97			
School Adjustment	Boy	169	71.24	2.27	303	
	Girl	136	73.51			

*p > . 65

**p > . 07

Table7 presents the results of mean differences test (t-test) for boys and girls. The table shows that even though girls scored slightly higher, the gender difference in teacher - child relationship was not statistically significant. Closer examination indices that boys (Mean 79.35) received almost equal score with girls (Mean = 79.97)for teacher -child relationship variable, and lower (Mean= 71.24) than girls (Mean =73.51) for the school adjustment variable

3.4. Cluster Differentiations in Sub-scale Scores and types of cluster

The basic questions dealt in this section is describing the type of teacher –child relationship clusters present in kindergarten. Again mean difference tests were performed between the three clusters for close relationship, conflict relation, over dependency, adjustment, and conduct problem sub- scales. And the results are presented in table 8

Table 8

Cluster Differentiation in Sub -scale Scores

Cluster cases	Closer Relation		Conflict Relation		Over dependency Relation		Adjustment to School		Conduct Problem	
	Mean difference	t-value	Mean difference	t-value	Mean difference	t-value	Mean difference	t-value	Mean difference	t-value
1 2	6.83	12.59	-4.86	-11.84	-1.96	-7.3	10.63	12.99	-3.1	-8.22
1 3	13.47	20.66	-11.28**	-21.69	-4.23**	-11.61	27.38	30.27	-5.61	-11.93*
2 3	6.65	9.23	-6.43	-11.46	-2.26	-6.38	16.75	16.82	-2.52	-4.79

**p < .01 for honest significance differences

*p < .05

As presented in table 8, children in cluster one on the average received higher score in close relationship subscale (Mean = 39.61) than children in cluster two (Mean = 32.78) and cluster three (Mean = 26.13) (see Appendix H) .In addition, they have got extremely

minimum scores in both conflict and over dependency relationship subscales (Mean = 11 and 5.83) than the other clusters. More over, the mean difference test shows the presence of a more statistically significant difference between cluster one and the rest. Hence, children in this cluster may be labeled as more positively involved in their relationship with their teachers. Furthermore, children in this group have been found to be well adjusted in school (Mean = 61.19) and have less conduct problems (Mean = 10.17).

The difference between children in cluster two and three were also shown in table 8. Children in cluster two were found to have a moderate close relationship scores (Mean = 32.78), minimum scores in over dependency (Mean = 7.81) and conflict relations (Mean = 15.85). On the average they are found to have a moderate positive involvement in relationship with their teachers. With regard to school adjustment and conduct problems, they are characterized as fairly adjusted to school and have less conduct problems. Children in cluster three on the average received very low scores in close relationship (Mean = 26.13); and very high scores in conflict and over dependency relationships (mean = 22.28 and 10.07). Children in this group are generalized to have negative involvement in relationship with their teachers. In addition, they are also found to exhibit adjustment difficulties and conduct problems in the school environment.

In summary, teacher- child relationships can be described into three: more positively involved children, who are also well adjusted in the school environment, moderately positively involved and fairly adjusted children, and finally negatively involved and problematic children, and finally negatively involved and problematic children.

3.5 Correlation's of Teacher- child Relationship and Adjustment to school

The section treats whether there is significant correlation between teacher-child relationship and school adjustment scores for the whole sample group and for each cluster solution Pearson's product. Pearson's product moment correlation coefficient was computed and the following results were obtained.

Table 9

Correlations

Case	Correlation
Whole group	.78**
Cluster 1	.472**
Cluster 2	.464**
Cluster 3	.458**

** Correlation is significant at .01 level (2-tailed)

As it is presented in table 9, the correlations between teacher- child relationships and children's school adjustment were statistically significant. In the whole group, about 60.84% of the variation in school adjustment may be attributed to the variation in teacher-child relationship. The children's school adjustment variation attribution to the teacher -child relationship was 22.78% for children in cluster one, 21.53% for cluster two, and 20.97% for cluster three respectively.

CHAPTER FOUR

4. DISCUSSION

This chapter is meant for discussing results in the following sequence:

1. Teacher child Relationship Patterns
2. Children's school adjustment variation among the Relationship patterns
3. Gender Difference in Teacher -child Relationship and school Adjustment

4.1 Teacher -Child Relationship patterns

Recent research attempting to describe teacher-child relationships is emerging, and it is based on two foundations: the common experience of teachers, parents and children that relationships are important components of the school experience and are related to children's adjustment and research in social development, attachment theory, and teaching -learning that increasingly shows the importance of adult- child relationships are contexts for development (Pianta,1994). Furthermore, the growing interests of Vigotiskian theory of learning call attention to the primary of social processes in learning and development (Sroufe, 1995). Relationships with adults play a central role in the development and adaptation of young children (Pianta, 1995)

During the early school years, a teacher is a central person in a child's life; children often spend more of their waking hours with a teacher than with parents, and the teacher -child relationship in which academic and social learning takes place, is itself a context for development. Teacher -child relationships are considered as agents of developmental change in school (Sroufe, 1989).

In the present research study, the sampled children were grouped in to three types of relationships with their teacher namely: More positively involved (close/warm relationship), moderately positively involved (functional average), and negatively involved (problematic children) who showed conflict and over dependency relationships with the teacher. The groups were found to vary significantly ($F = 826.52, .001$ and $df 302$) which each other the factor based subscales of the teacher-child relationship (TCRS) used in this study involves dimensions of closeness which reflect positive involvement, conflict and dependency subscales which reflect negative involvement and over involvement respectively. In a series of descriptive studies, Pianta and Steinberg (1992) and Pianta (1994) have also showed that dimensions of closeness, conflict and over dependency as reported from the teacher's perspective, can characterize teacher-child relationship.

The more positively involved group of children were found to be high on closeness (warmth) subscale items such as "I share an affectionate, warm relationship with this child," and very low for conflict subscales items like "this child and I seem to be struggling with each other", and on over dependency items like "this child is overly dependent on me."

The moderately positively involved group named as functional average in Pianta's (1994) finding on the other hand, were at midrange on both positive affect (closeness) and negative affect (conflict and over dependency) subscale items. Whereas, the negatively involved / problematic children were very high for conflict items, moderately high for over dependency involvement and extremely low for closeness/warm relationship items.

The cluster solution in the present study were found to complement Lynch and Cicchetti's (1992) report of teacher-child relationship typology based on the concept of the child's

psychological proximity seeking (analogous to involvement) and emotional quality (analogous to closeness) . And, Pianta's (1997) finding of generally positively involved and negatively involved patterns of teacher -child relationship also agreed with the present finding.

The more positively involved and to a lesser extent the functional average group, showed behaviors towards their teacher that were indicative of a secure and close relationship; they shared personal information, appeared comfortable, were not too dependent, and in general displayed positive affect in response to the teacher's interaction. The negatively involved / the problematic children's relationship on the other hand, represent considerable conflict, over dependency, and little or no closeness and open communication between the children and the teacher. These kindergarten children seemed closed off from the positive aspects of relating with a teacher, anger and conflict dominated their contacts, and they are undoubtedly in need of intervention schemes. Teacher -Child relationships are a key relational context for the child, and may provide a window for identification of risk and for intervention (Pianta, 1994).

4.2 Children's School Adjustment Variation Among the Relationship Patterns

When entering Kindergarten, children face many demands: how to become an accepted member of the peer group, co-operate with authority figures such as the teacher, become involved in academic development, and perform well on academic skill building activities (Pianta,Steinberg and Rollins, 1995). Relationship with adults (parent and teachers) had implications on how children respond to situations involving problem solving and acquiring new information.

Teacher-child relationship can also be involved in children's self concept and expectations regarding academic performance. It has also been proposed that a positive teacher -child relationship may significantly facilitate a child's adaptation to school especially for children at high risk for failure (Sroufe,1983). A positive relationship with a kindergarten teacher was associated with better adjustment (lower levels of behavior problems and higher levels of competence behavior), and a negative relationship was strongly associated with a downward trend in adjustment (high levels of behavior problems and lower levels of competence behavior).Nevertheless the results of this and other studies do not suggest that teacher -child relationship are the sole predictor of school adjustment, nor do they suggest the other relationship or experiences prior to school entry have no relation to school adjustment. In relation to this attachment theory and research strongly suggest that child - parent relationships are a primary determinant of the quality of teacher -child relationship and school adjustment (Hamilton and Howes, 1992).

In the present study, all correlations between teacher child relationships and school adjustment scores were found to be statistically significant at the .01 level (two tailed), and they are in the expected direction. For instance, 60.84% of the variation in school adjustment in the whole group, 22.78%, 21.53%, and 20.97% in the three different patterns may be attributed to the variation in teacher -child relationships. Children who were rated as having a relatively positive relationship (high closeness low conflict and negligible over dependency) with their kindergarten teachers tended obtain better scores on school adjustment. On the other hand, children who were rated as having a relatively negative relationship with their kindergarten teachers tended to obtain worse on school adjustment.

Children in the three different relationship patterns significantly vary in their school adjustment behavior ($F=153.15, df 302, p<.001$). The more children are positively involved with the teacher, the more they become well adjusted to school and the lesser they exhibit problem of conduct. These children outshine in academic competence, peer relations, language development and maturity levels. Pianta & Steinberg (1995) also found this group of children to have high academic performance in School, more outgoing, gregarious, accepted by press and were less aggressive to their teacher and in the peer context.

On the other hand, those children who have negative involvement (conflicual and over dependency) in their relationship with the teacher were found to be incompetent in academic matters showed more social withdrawal and hostile aggression towards their peers. Moreover, expectations, competencies, and attitude developed within adult -child attachment relationships are expected to influence the child's orientation to peer relationships are expected to influences the child's orientations to peer relationship. (Howes, Hamillion and Matheson, 1994). Teacher dependent children, for instance, would be less competent with press because their dependent behavior would affect the development of peer relationship; they tend to withdraw from the group and solely rely on the teacher to solve problems with peers.

The emotionally secure (close) preschoolers seek instrumental assistance from the teacher when the child demands. But, the dependent one seeks attentions and contact with the teacher demanding help without trying to solve problems on his own. This kind of dependent child may complicate the emerging child-centered instruction and impose unnecessary burden on the kindergarten teacher.

4.3 Gender Differences in Teacher -Child Relationship and in School Adjustment.

Gender differences for both teacher-child relationship and school adjustment variables were not statistically significant (table 6) ($t = .449, df 303, p > .65$) for the former, and ($t = 1.82, df 303, p > .07$) for the later. A similar study by Pianta and Steinberg (1992), and Pianta (1996) also reported statistically insignificant differences between the two sexes with respect to teacher -child relation and school adjustment variables.

The underlining explanation for the non- presence of gender differences may be the instability of gender stereotyping attribution in the early ages (Sroufe 1995).

“We also do not expect more gender -differentiated interactions /relationships to appear before the shift to the middle childhood period.” (Lynch and Cichetti, 1992).

In the present study, the kindergarten boys and girls, nearly equally distributed in the three different teacher -child relationship patterns and school adjustment. In the more positively involved (close/warm) relationship pattern ($n = 106$, boys = 55, Girls = 51); in the moderately positively involved (functional average) Pattern ($n = 132$, Boys = 78, Girls = 54), and the negatively involved (problematic) relationship pattern ($n = 67$, Boys = 36, Girls = 31). see Appendix F for detail). Therefore, as in the other studies in the area, gender difference was not found for both teacher -child relationship and the Childs school adjustment in this study.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

This study investigated to answer the following basic question:

1. What types of teacher -child relationship patterns are there in kindergarten?
2. Is there a significant difference in the children's school adjustment among the relationship patterns?
3. Does the teacher -child relationship pattern significantly different for boys and girls?

Based on this, the following results were obtained.

- Three types of teacher -child relationship patterns are described. In addition, the children in these patterns significantly differ for their relationship with the teacher.
- The children in the three teacher -child relationship patterns were found to differ significantly in school adjustment such as school readiness, social relations competence, personal maturity, and conduct problems. The more positive relationship the children have with their teacher the more they become well adjusted to school.
- In this study, a statistically significant gender differences are not reported for both teacher-child. relationship and children's school adjustment variable

5.2 CONCLUSION

Child -adult relationship is a particular social- context that has salience for the development of a number of social and academic outcomes in early childhood particularly in teacher-child relationship serve as regulatory functions with respect to emotional and academic skill development. In so doing, they have enormous influence on a child's competence in early childhood settings.

The results of this study indicate differential school adjustment of kindergarten children of the relationship patterns. Children in the positively involved pattern were better adjusted, and children in the functional average pattern were fairly adjusted in a number of areas such as school readiness, social relations competence and personal maturity than the children in the negatively involved relationship pattern.

Teacher - child relationships are believed to be part of a developmental process that have complex and multifactor determinates, as does adjustment. In fact, it is highly likely that factors other than the teacher -child relationship (such as parenting style) may contribute to the child's school adjustment. However, the value of assessing teacher-child relationships rely in relation to promoting motivation to the well adjusted group, and in intervention for present and subsequent adjustment problems. Teacher child relationships and interactions may represent a potential arena for intervention that was not usually considered by educators, yet is often acknowledge as the key to success especially for high risk children.

However, it has to be taken care of that improving teacher -child relationship does not guarantee improved school adjustment. Nevertheless, this study indicates that teacher - child relationship may play a role in adjustment to school and may be a useful target in a

comprehensive program of intervention involving multiple focuses within the classroom, school, home, and the peer context.

5.3 RECOMMENDATION

There are a number of implications of this study for practice and research in school psychology. Based on the findings in this research, the following recommendations are given.

- Identification of children's competence behavior and problem behavior must be facilitated as early as possible.
- Intervention schemes especially for those with high-risk problematic children must be easily maintained in the early, sensitive, and formative years.
- Educators in general and school psychologists in particular must play a major role in extending research to the school context, and apply research outcomes in the process of schooling to enhance the child's welfare.
- By using identification and intervention schemes in the early years kindergarten administrators, teachers, and school counselors in cooperation with parents must optimize the individual child's adjustment in the school program.
- Kindergarten teacher -training contents need to be focused in line with social process of learning.
- The criteria for selecting candidates of kindergarten teacher training need to be thoroughly studied and outlined to strength the situations
- Further research development in the area of teacher -child relationship and children's adjustment in the kindergarten is necessary.

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APPENDICES

Appendix A

A list of kindergartens Included in the Area

1. Mount Olive
2. Adventist
3. SOS
4. Yenegew Sew
5. Biruh Tesfa
6. Union
7. Sun Light
8. Hiwot Birhan

በአዲስ አበባ ዩኒቨርሲቲ
ድህረ ምረቃ ት/ቤት
የሳይክሎጂ ትምህርት ክፍል

በአፀደ ህፃናት የመምህር- ህፃን ቀረቤታን በተመለከተ በመምህሩ የሚሞላ መጠይቅ።

የመጠይቁ ዓላማ፡- በአፀደ ህፃናት መምህራንና ህፃናት መካከል ያለውን የቀረቤታ ዓይነት ለይቶ ለመተንተንና የህፃኑን ት/ቤት የመላመድ ሁኔታ ለማጤን ነው።

መመሪያ፡- ለርስዎ ተስማሚ የሆነውን መልስ በዚህ ምልክት « ✓ » ሳጥኑ ውስጥ ያመልክቱ።

መጠይቁን በእርጋታ እንድሞሉ አየጠየኩ ስለ ትብብርዎ በቅድሚያ አመሰግናለሁ።

ሀ. የአፀደ ህፃናቱ ሥም _____

ለ. የህፃኑ ሥም _____

ፆታ _____ ዕድሜ _____

ተራ ቁ.	የቅርርብ ሁኔታ	ሙሉ በሙሉ ትክክል ነው	በአብዛኛው ትክክል ነው	እርግጠኛ መሆን ያዳግተኛል	በአብዛኛው ትክክል አይደለም	ሙሉ በሙሉ ትክክል አይደለም
1	ይህ ህፃን ከእኔ ጋር ያለውን ቀረቤታ ዋጋ ይሰጠዋል					
2	ይህ ህፃን ከተመሰገነና ከተበረታታ ደስ ይለዋል					
3	ይህ ህፃን በማንኛውም ጊዜ ስለ ራሱ ሁኔታ ሀሳብ ያከፍለኛል					
4	ከዚህ ህፃን ጋር ጠበቅ ያለ አስደሳች ቀረቤታ እንጋራለን					
5	ይህ ህፃን ብዙውን ጊዜ ከእኔ ጋር አይስማማም					
6	ይህ ህፃን በተናደደ ጊዜ እንዳያናወደ ይፈልጋል					
7	ይህ ህፃን ከስህተቱ እንድማር ሳይደርገው የሚጨቁነው ይመስለዋል					
8	ይህ ህፃን ከመጠን ያለፈ በእኔ ላይ ጥገኛ ይሆናል					
9	ይህ ህፃን በእኔ በቀላሉ ይናደዳል ይቆጣልም					
10	ህፃኑ በሩ ሁኔታ እንዳልተንከባከብኩት ይሰማዋል					
11	ይህ ህፃን ብዙውን ጊዜ አኔን ለማስደሰት ይሞክራል					

ተራ ቁ.	የቅርርብ ሁኔታ	ሙሉ በሙሉ ትክክል ነው	በአብዛኛው ትክክል ነው	እርግጠኛ መሆን ያዳግተኛል	በአብዛኛው ትክክል አይደለም	ሙሉ በሙሉ ትክክል አይደለም
12	ይህ ህፃን ሲረብሽ ከተገለፀ አይቀበልም ወይም ያኮርፋል					
13	ይህ ህፃን በማያስፈልገው ጊዜ ጭምር እርዳታዬን ይጠይቃል					
14	ይህ ህፃን እኔን የሚገሚተኝ በቀጭነት ብቻ ነው					
15	ይህ ህፃን የእኔን ተግባር ሲከተል አስተወያዋለሁ					
16	የዚህ ህፃን ጠባይ ያሰለቸኛል					
17	ይህ ህፃን ከእኔ አንድ ነገር ከፈለገ በቁጣ መንፈስ ይጠይቀኛል					
18	ይህ ህፃን ስለ እኔ ያለው አመለካከት ተለዋዋጭ ነው					
19	ከዚህ ህፃን ጋር ያለን መቀራረብ የወጤታማነት መንፈስ እንድናረኝ ያደርጋል					
20	ይህ ህፃን ብያስፈልገው እንኳን የእኔን ድጋፍ ለመቀበል ፊቃደኛ ሆኖ አይገኝም					
21	ይህ ህፃን ስሜቱንና ልምዱን በግልጽ ይነግረኛል					

በአዲስ አበባ ዩኒቨርሲቲ
ድህረ ምረቃ ት/ቤት
የሳይክሎጂ ትምህርት ክፍል

በአፀደ ህፃናት የመምህር- ህፃን ቀረቤታን በተመለከተ በመምህሩ የሚሞላ መጠይቅ።

የመጠይቁ ዓላማ፡- በአፀደ ህፃናት የህፃኑን የመላመድ ደረጃ ለማጤን ነው።

መመሪያ፡- ለርስዎ ተስማሚ የሆነውን መልስ በዚህ ምልክት « ✓ » ሳጥኑ ወ.ስጥ ያመልክቱ።

መጠይቁን በእርጋታ እንድሞሉ አየጠየኩ ስለ ትብብርዎ በቅድሚያ አመሰግናለሁ።

ሀ. የአፀደ ህፃናቱ ሥም _____

ለ. የህፃኑ ሥም _____

ያታ _____ ዕድሜ _____

ተራ ቁ.	የቅርርብ ሁኔታ	ሙሉ በሙሉ ትክክል ነው	በአብዛኛው ትክክል ነው	እርግጠኛ መሆን ያዳግተኛል	በአብዛኛው ትክክል አይደለም	ሙሉ በሙሉ ትክክል አይደለም
1	ይህ ህፃን ለትምህርት ሥራ አዎንታዊ ዝንባሌ አለው					
2	ህፃኑ አዳዲስ ሃሳቦችን የማፍለቅ ችሎታ አለው					
3	ይህ ህፃን ለትምህርቱ በቂ ትኩረት ይሰጣል					
4	ይህ ህፃን የግል ፍላጎቶቹን በገልጽ ያውቃል					
5	ህፃኑ የእኔን ትዕዛዝናመመሪያ ይቃረናል					
6	ህፃኑ አፀደ ህፃናት ሲሆን ይዝናናል					
7	ይህ ህፃን በቂ የቋንቋ ችሎታ አለው					
8	ይህ ህፃን አግባብነት ያላቸው ወቀሳና ትችቶችን ይቀበላል					
9	ይህ ህፃን የመጫወቻ ቁሳቁሶችን በቀላሉ መጠቀም ይችላል					
10	ይህ ህፃን ከጓደኞቹ ጋር አዎንታዊ የሆነ መቀራረብ አለው					
11	ህፃኑ ተናጻጅና ቁጡ ነው					
12	ህፃኑ የሚፈልገውን ነገር በበቂ የቋንቋ ችሎታ መጠየቅ ይችላል					
13	ይህ ህፃን እንግዳ ከሆኑ አዋቂ ሰዎች ጋር ፈጥኖ መግባባት ይችላል					
14	ይህ ህፃን ለአዲስ ተግባር አዎንታዊ ዝንባሌ አለው					
15	ህፃኑ የሚሰጠውን መመሪያ በአትኩሮት ይከታተላል					

16	ይህ ህፃን ለማንኛውም ነገር የእኔን ማረጋገጫ ይፈልጋል					
17	ህፃኑ በአፀደ-ህፃናት ግቢ ውስጥ መሆን ያስደስተዋል					
18	ይህ ህፃን ረባሽና በመማር ማስተማሩ ሥራ ላይ ተጽእኖ የሚያሳድር ነው					
19	ይህ ህፃን ከሌሎች ህፃናት ጋር ይጣላል					

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUTE STUDIES
DEPARTEMENT OF PSYCHOLOGY

The purpose of the study is to identify pre school teacher-child relationship pattern. Hence, you are kindly requested to respond to every item in the questionnaire. Your correct and complete response to this questionnaire will have a great effect on the success or failure of the study.

Thank you in Advance for your cooperate.

- **Direction:** - Please indicate your, response to each item using a tick mark (✓) in the appropriate response category.

Before going to the questionnaire, please, furnish the following.

Name of the kindergarten _____

Name of the child: _____

Sex: _____

Age: _____

Part - I

No	Child- Teacher Relationship	Definitely Applies	Applies Some What	Neutral Not sure	Not Really	Definitely Does not apply
1	This child values his/her relationship with me					
2	When I praise this child ,he/she beams with pride					
3	This child spontaneously shares information about himself/herself					
4	I share an affectionate and warm relationship with this child					
5	This child and I always seem to be struggling with each other.					
6	If gets upset ,this child seeks comfort from me					

No	Child- Teacher Relationship	Definitely Applies	Applies Some What	Neutral Not sure	Not Really	Definitely Does not apply
7	This child appears hurt or embarrassed when I correct him/her					
8	This child is overly dependent on me					
9	This child easily becomes angry with me					
10	This child feels that I treat him/her unfairly					
11	This child tries to please me					
12	This child remains angry or resistant after being disciplined					
13	This child asks for my help when he/she really does not need help					
14	The child sees me as a source of punishment or criticism					
15	I have noticed this child copying my behavior or ways of doing things					
17	This child whines or cries when he/she wants something from me					
18	This child's feeling toward me can be unpredictable or can change suddenly					
19	My interactions with child make me feel effective and confident					
20	This child does not accept my help when he/she needs it					
21	This child openly shares his/her feelings and experiences with me					

Part II

No	School Adjustment	Definitely Applies	Applies Some What	Neutral Not sure	Not Really	Definitely Does not apply
1	The child has a positive attitude to work /learning activities					
2	He/she is creative and forward original ideas					
3	This child has a satisfactory level of concentration					
4	He/she is able to cope with personal needs					
5	This child is resistant to the teacher's command and instruction					
6	This child settles in school					
7	This child is able in verbalizing his/her school work					
8	This child accepts genuine criticism and blame					
9	He/she can easily manipulate play materials					
10	This child has a positive relationship with peers					
11	This child easily annoyed or became angry					
12	This child competently verbalizes his wants and needs					

No	School Adjustment	Definitely Applies	Applies Some What	Neutral Not sure	Not Really	Definitely Does not apply
13	This child can relate maturity with unfamiliar adults					
14	This child has a positive attitude towards new activities					
15	This child follows instructions curiously					
16	This child often seek the teacher's attentions					
17	This child has interest in the school environment					
18	This child is disruptive and influences the classroom mood					
19	This child is in rows with other children					

Appendix D

Distribution of Teacher-Child Relationship Scores for Boys and Girls

Boys						Girls				
80	72	76	93	96	80	89	87	80	79	72
72	75	76	94	91	71	84	86	86	77	76
95	74	80	84	65	85	85	81	84	99	88
68	75	78	62	96	90	50	72	86	65	80
91	91	93	83	102	71	88	86	85	60	78
90	82	97	67	102	81	57	82	92	64	76
73	85	92	89	59	78	61	80	97	87	50
93	91	92	70	71	91	83	81	98	90	77
97	82	90	87	65		87	76	74	71	
87	85	77	86	55		88	62	79	71	
77	91	73	97	87		68	90	53	47	
94	97	76	111	74		91	85	84	76	
65	89	69	68	53		103	68	83	57	
89	86	77	65	82		78	92	89	83	
91	82	63	93	91		74	60	83	80	
93	86	91	59	74		72	67	72	85	
63	85	84	58	81		93	58	96	56	
79	85	76	65	69		100	62	86	74	
89	82	99	80	82		61	77	68	100	
91	86	85	90	72		75	71	92	102	
89	74	76	80	74		96	100	100	88	
89	79	67	76	77		105	76	68	65	
80	79	61	80	71		91	78	70	69	
87	64	69	72	98		97	85	90	91	
99	53	78	77	74		90	87	68	90	
91	64	84	85	91		86	92	84	78	
74	76	94	74	52		88	85	58	79	
90	82	73	56	61		87	79	95	94	
82	68	97	59	57		56	74	96	92	
75	84	62	65	74		62	77	77	66	
81	86	71	76	71		66	91	82	68	
94	78	61	84	83		65	85	97	78	

Appendix E

Distribution of School Adjustment Scores for boys and girls

Boys					Girls				
75	91	76	41	71	59	80	89	73	60
75	88	87	65	67	77	71	78	72	68
79	88	85	62	72	78	82	51	75	66
58	82	78	57	55	72	72	60	69	80
76	79	73	75	65	84	73	58	48	74
79	85	72	77	72	84	89	57	79	69
82	90	61	88	77	72	72	71	68	55
73	89	81	60	75	64	48	84	71	84
73	82	64	57		76	85	88	62	
68	56	76	79		76	85	79	70	
77	62	79	83		74	72	88	83	
78	56	78	43		69	65	94	71	
66	64	77	75		75	83	73	73	
67	73	67	81		77	73	68	74	
65	77	80	75		66	82	84	77	
67	82	77	50		55	57	83	89	
70	75	73	75		63	62	68	84	
58	73	71	77		56	90	70	60	
62	77	62	59		77	78	70	68	
70	59	80	70		65	78	79	79	
75	58	89	63		84	87	80	84	
74	66	75	75		72	73	80	77	
69	62	60	64		66	81	38	57	
72	74	77	67		72	68	77	73	
71	79	87	60		73	73	51	72	
55	79	59	42		78	75	58	90	
75	63	72	91		78	68	86	91	
68	69	87	81		71	73	91	79	
76	73	87	74		73	46	84	72	
58	69	75	32		72	58	64	90	
68	74	75	52		78	68	91	91	
58	75	76	54		83	81	89	72	

Appendix F

Frequency Table of Relationship cluster Membership of boys & girls

Cluster	Total	Number of boys	%	Number of girls	%
1	106	55	52%	51	48%
2	132	78	59%	54	40.9%
3	67	36	53.7%	31	46.3%
Grand Total	305	169	54.9%	136	45.1%

Appendix G
Multiple Comparison Results
(Post hoc test Results)

Score of X	Cluster Case (i)	Cluster Case(j)	Mean Difference (i - j)	Standard error	Sig.
Tukey HSD	1	2	14.04	.62	.00
		3	29.82	.74	
	2	1	-14.04	.62	.00
		3	15.78	.71	
	3	1	-29.82	.74	.00
		2	-15.78	.71	
Score of Y			--	--	---
Tukey HSD	1	2	9.51	1.00	.00
		3	20.92	1.20	
	2	1	-9.51	1.00	.00
		3	11.41	1.15	
	3	1	-20.92	1.20	.00
		2	-11.42	1.15	

Score of X = Teacher-child relationship

Score of Y = School Adjustment

Appendix –H

Subscale Score Means and Standard Deviations for the three clusters

Subscale	Cluster Case					
	1(N=106)		2(N=132)		3(N=67)	
	Mean	SD	Mean	SD	Mean	SD
Close Relationship	39.61	12.14	32.78	21.35	26.13	25.91
Conflict Relationship	11	8.53	15.86	10.89	22.28	15.24
Over dependency relationship	5.84	4.18	7.81	4.65	10.07	7.44
Adjustment	61.19	30.15	50.56	46.63	33.81	39.05
Conduct problems	10.17	5.26	13.27	10.77	15.79	15.15

The maximum score for:

- * Close Relationship = 45
- * Conflict relationship = 25
- * Over-dependency = 15
- * Adjustment = 70
- * Conduct problems = 25

Use for MSD = $y_{\bar{x}} \sqrt{\frac{10}{n}}$

Error df	α	$k = \text{number of means or number of steps between ordered means}$									
		2	3	4	5	6	7	8	9	10	11
5	.05	3.64	4.60	5.22	5.67	6.03	6.33	6.58	6.80	6.99	7.17
	.01	5.70	6.98	7.80	8.42	8.91	9.32	9.67	9.97	10.24	10.48
6	.05	3.46	4.34	4.90	5.30	5.63	5.90	6.12	6.32	6.49	6.65
	.01	5.24	6.33	7.03	7.56	7.97	8.32	8.61	8.87	9.10	9.30
7	.05	3.34	4.16	4.68	5.06	5.36	5.61	5.82	6.00	6.16	6.30
	.01	4.95	5.92	6.54	7.01	7.37	7.68	7.94	8.17	8.37	8.55
8	.05	3.26	4.04	4.53	4.89	5.17	5.40	5.60	5.77	5.92	6.05
	.01	4.75	5.64	6.20	6.62	6.96	7.24	7.47	7.68	7.86	8.03
9	.05	3.20	3.95	4.41	4.76	5.02	5.24	5.43	5.59	5.74	5.87
	.01	4.60	5.43	5.96	6.35	6.66	6.91	7.13	7.33	7.49	7.65
10	.05	3.15	3.88	4.33	4.65	4.91	5.12	5.30	5.46	5.60	5.72
	.01	4.48	5.27	5.77	6.14	6.43	6.67	6.87	7.05	7.21	7.36
11	.05	3.11	3.82	4.26	4.57	4.82	5.03	5.20	5.35	5.49	5.61
	.01	4.39	5.15	5.62	5.97	6.25	6.48	6.67	6.84	6.99	7.13
12	.05	3.08	3.77	4.20	4.51	4.75	4.95	5.12	5.27	5.39	5.51
	.01	4.32	5.05	5.50	5.84	6.10	6.32	6.51	6.67	6.81	6.94
13	.05	3.06	3.73	4.15	4.45	4.69	4.88	5.05	5.19	5.32	5.43
	.01	4.26	4.96	5.40	5.73	5.98	6.19	6.37	6.53	6.67	6.79
14	.05	3.03	3.70	4.11	4.41	4.64	4.83	4.99	5.13	5.25	5.36
	.01	4.21	4.89	5.32	5.63	5.88	6.08	6.26	6.41	6.54	6.66
15	.05	3.01	3.67	4.08	4.37	4.59	4.78	4.94	5.08	5.20	5.31
	.01	4.17	4.84	5.25	5.56	5.80	5.99	6.16	6.31	6.44	6.55
16	.05	3.00	3.65	4.05	4.33	4.56	4.74	4.90	5.03	5.15	5.26
	.01	4.13	4.79	5.19	5.49	5.72	5.92	6.08	6.22	6.35	6.46
17	.05	2.98	3.63	4.02	4.30	4.52	4.70	4.86	4.99	5.11	5.21
	.01	4.10	4.74	5.14	5.43	5.66	5.85	6.01	6.15	6.27	6.38
18	.05	2.97	3.61	4.00	4.28	4.49	4.67	4.82	4.96	5.07	5.17
	.01	4.07	4.70	5.09	5.38	5.60	5.79	5.94	6.08	6.20	6.31
19	.05	2.96	3.59	3.98	4.25	4.47	4.65	4.79	4.92	5.04	5.14
	.01	4.05	4.67	5.05	5.33	5.55	5.73	5.89	6.02	6.14	6.25
20	.05	2.95	3.58	3.96	4.23	4.45	4.62	4.77	4.90	5.01	5.11
	.01	4.02	4.64	5.02	5.29	5.51	5.69	5.84	5.97	6.09	6.19
24	.05	2.92	3.53	3.90	4.17	4.37	4.54	4.68	4.81	4.92	5.01
	.01	3.96	4.55	4.91	5.17	5.37	5.54	5.69	5.81	5.92	6.02
30	.05	2.89	3.49	3.85	4.10	4.30	4.46	4.60	4.72	4.82	4.92
	.01	3.89	4.45	4.80	5.05	5.24	5.40	5.54	5.65	5.76	5.85
40	.05	2.86	3.44	3.79	4.04	4.23	4.39	4.52	4.63	4.73	4.82
	.01	3.82	4.37	4.70	4.93	5.11	5.26	5.39	5.50	5.60	5.69
60	.05	2.83	3.40	3.74	3.98	4.16	4.31	4.44	4.55	4.65	4.73
	.01	3.76	4.28	4.59	4.82	4.99	5.13	5.25	5.36	5.45	5.53
20	.05	2.80	3.36	3.68	3.92	4.10	4.24	4.36	4.47	4.56	4.64
	.01	3.70	4.20	4.50	4.71	4.87	5.01	5.12	5.21	5.30	5.37
∞	.05	2.77	3.31	3.63	3.86	4.03	4.17	4.29	4.39	4.47	4.55
	.01	3.64	4.12	4.40	4.60	4.76	4.88	4.99	5.08	5.16	5.23

Table : Critical Values of t -test

$t_{2,3} = 10$
10/10

df/n-2	Level of significance for one-tailed test					.0005
	.10	.05	.025	.01	.005	
	Level of significance for two-tailed test					
	.20	.10	.05	.02	.01	.001
1	3.078	6.314	12.706	31.821	63.657	636.619
2	1.886	2.920	4.303	6.965	9.925	31.598
3	1.638	2.353	3.182	4.541	5.841	12.941
4	1.533	2.132	2.776	3.747	4.604	8.610
5	1.476	2.015	2.571	3.365	4.032	6.859
6	1.440	1.943	2.447	3.143	3.707	5.959
7	1.415	1.895	2.365	2.998	3.499	5.405
8	1.397	1.860	2.306	2.896	3.355	5.041
9	1.383	1.833	2.262	2.821	3.250	4.781
10	1.372	1.812	2.228	2.764	3.169	4.587
11	1.363	1.796	2.201	2.718	3.106	4.437
12	1.356	1.782	2.179	2.681	3.055	4.318
13	1.350	1.771	2.160	2.650	3.012	4.221
14	1.345	1.761	2.145	2.624	2.977	4.140
15	1.341	1.753	2.131	2.602	2.947	4.073
16	1.337	1.746	2.120	2.583	2.921	4.015
17	1.333	1.740	2.110	2.567	2.898	3.965
18	1.330	1.734	2.101	2.552	2.878	3.922
19	1.328	1.729	2.093	2.539	2.861	3.883
20	1.325	1.725	2.086	2.528	2.845	3.850
21	1.323	1.721	2.080	2.518	2.831	3.819
22	1.321	1.717	2.074	2.508	2.819	3.792
23	1.319	1.714	2.069	2.500	2.807	3.767
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690
28	1.313	1.701	2.048	2.467	2.763	3.674
29	1.311	1.699	2.045	2.462	2.756	3.659
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
20	1.289	1.658	1.980	2.358	2.617	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.291

Table D. Critical Values of the Pearson Product Moment Correlation Coefficient

<i>degrees of freedom</i> $df = N - 2$	Level of significance for one-tailed test				
	.05	.025	.01	.005	.0005
	Level of significance for two-tailed test				
	.10	.05	.02	.01	.001
1	.9877	.9969	.9995	.9999	1.0000
2	.9000	.9500	.9800	.9900	.9990
3	.8054	.8783	.9343	.9587	.9912
4	.7293	.8114	.8822	.9172	.9741
5	.6694	.7545	.8329	.8745	.9507
6	.6215	.7067	.7887	.8343	.9249
7	.5822	.6664	.7498	.7977	.8982
8	.5494	.6319	.7155	.7646	.8721
9	.5214	.6021	.6851	.7348	.8471
10	.4973	.5760	.6581	.7079	.8233
11	.4762	.5529	.6339	.6835	.8010
12	.4575	.5324	.6120	.6614	.7800
13	.4409	.5139	.5923	.6411	.7603
14	.4259	.4973	.5742	.6226	.7420
15	.4124	.4821	.5577	.6055	.7246
16	.4000	.4683	.5425	.5897	.7084
17	.3887	.4555	.5285	.5751	.6932
18	.3783	.4438	.5155	.5614	.6787
19	.3687	.4329	.5034	.5487	.6652
20	.3598	.4227	.4921	.5368	.6524
25	.3233	.3809	.4451	.4869	.5974
30	.2960	.3494	.4093	.4487	.5541
35	.2746	.3246	.3810	.4182	.5189
40	.2573	.3044	.3578	.3932	.4896
45	.2428	.2875	.3384	.3721	.4648
50	.2306	.2732	.3218	.3541	.4433
60	.2108	.2500	.2948	.3248	.4078
70	.1954	.2319	.2737	.3017	.3799
80	.1829	.2172	.2565	.2830	.3568
90	.1726	.2050	.2422	.2673	.3375
100	.1638	.1946	.2301	.2540	.3211

Table 16.2

Scores of three groups of subjects in a hypothetical experiment

Group 1		Group 2		Group 3	
X_1	X_1^2	X_2	X_2^2	X_3	X_3^2
4	16	12	144	1	1
5	25	8	64	3	9
4	16	10	100	4	16
3	9	5	25	6	36
6	36	7	49	8	64
10	100	9	81	5	25
1	1	14	196	3	9
8	64	9	81	2	4
5	25	4	16	2	4
$\Sigma 46$	292	78	756	34	168

$$n_1 = 9, \quad \bar{X}_1 = 5.11 \quad n_2 = 9, \quad \bar{X}_2 = 8.67 \quad n_3 = 9, \quad \bar{X}_3 = 3.78$$

$$\Sigma X_{\text{tot}} = 46 + 78 + 34 = 158.$$

$$\Sigma X_{\text{tot}}^2 = 292 + 756 + 168 = 1216.$$

$$N = 27.$$

The following steps are employed in a three-group analysis of variance:

Step 1. Employing formula (16.2), the total sum squares is

$$\Sigma x_{\text{tot}}^2 = 1216 - (158)^2/27 = 291.41.$$

Step 2. Employing formula (16.5) for three groups, the between-group sum squares is

$$\Sigma x_B^2 = (46)^2/9 + (78)^2/9 + (34)^2/9 - (158)^2/27 = 114.96.$$

Step 3. The within-group sum squares may be obtained by employing formula (16.3) for three groups:

$$\Sigma x_W^2 = (292 - (46)^2/9) + (756 - (78)^2/9) + (168 - (34)^2/9) = 176.45.$$

You may obtain the within-group sum squares by subtraction, that is,

$$\Sigma x_W^2 = \Sigma x_{\text{tot}}^2 - \Sigma x_B^2 = 291.41 - 114.96 = 176.45.$$

Step 4. The between-group variance estimate is

$$df_B = k - 1 = 2, \quad s_B^2 = 114.96/2 = 57.48.$$

Step 5. The within-group variance estimate is

$$df_W = N - k = 24, \quad s_W^2 = 176.45/24 = 7.35.$$

Step 6. Employing formula (16.11) we find that the value of F is

$$F = 57.48/7.35 = 7.82, \quad df = 2:24.$$

To summarize these steps, we employ the format shown in Table 16.3.

Table 16.3

Summary table for representing the relevant statistics in analysis-of-variance problems

Source of variation	Sum squares	Degrees of freedom	Variance estimate	F
Between-groups	114.96	2	57.48	7.82
Within-groups	176.45	24	7.35	
Total	291.41	26		

By employing the format recommended in Table 16.3, you have a final check upon your calculation of sum squares and your assignment of degrees of freedom. Thus, $\sum x_B^2 + \sum x_W^2$ must equal $\sum x_{tot}^2$. The degrees of freedom of the total are found by

$$df_{tot} = N - 1. \quad (16.12)$$

In the present example, the number of degrees of freedom for the total is

$$df_{tot} = 27 - 1 = 26.$$

16.6 THE INTERPRETATION OF F

When we look up the F required for significance with 2 and 24 degrees of freedom, we find that an F of 3.40 or larger is significant at the 0.05 level.

Since our F of 7.87 exceeds this value, we may conclude that there is a significant difference among the means of our three experimental groups. Now, do we stop at this point? After all, are we not interested in determining whether or not one of the three methods of instructing the fundamentals of arithmetic is superior to the other two? The answer to the first question is negative, and the answer to the second is affirmative.

The truth of the matter is that our finding an overall significant F -ratio now permits us to investigate specific hypotheses. In the absence of a significant F -ratio, any significant differences between specific comparisons would have to be regarded as suspicious—very possibly representing a chance difference.

Over the past ten years, a large number of tests have been developed which permit the researcher to investigate specific hypotheses concerning population parameters. Two broad classes of such tests exist:

1. **A priori or planned comparisons:** When comparisons are planned in advance of the investigation, an *a priori* test is appropriate. For *a priori* tests, it is not necessary that the overall F -ratio be significant.
2. **A posteriori comparisons:** When the comparisons are not planned in advance, an *a posteriori* test is appropriate.

In the present example, we shall illustrate the use of an *a posteriori* test for making pairwise comparisons among means.

Tukey (1953) has developed such a test which he named the HSD (honestly significant difference) test. To employ this test, the overall F -ratio must be significant.

A difference between two means is significant, at a given α -level, if it equals or exceeds HSD, which is:

$$HSD = q_\alpha \sqrt{\frac{s_W^2}{n}} \quad q_\alpha \sqrt{\frac{S_{M,W}^2}{n}} \quad (16.13)$$

in which

s_W^2 = the within-group variance estimate,

n = number of subjects in each condition,

q_α = tabled value for a given α -level found in Table P for df_W

and

k = number of means.

each pair of means.

Table 16.4
Differences among means

	\bar{X}_1	\bar{X}_2	\bar{X}_3
$\bar{X}_1 = 5.11$...	3.56	1.33
$\bar{X}_2 = 8.67$	4.89
$\bar{X}_3 = 3.78$

Step 1. Prepare a matrix showing the mean of each condition and the differences between pairs of means. This is shown in Table 16.4.

Step 2. Referring to Table P under error $df = 24$, $k = 3$ at $\alpha = 0.05$, we find $q_{0.05} = 3.53$.

Step 3. Find HSD by multiplying $q_{0.05}$ by $\sqrt{\frac{s_w^2}{n}}$. The quantity s_w^2 is found in Table 16.3 under within-group variance estimate. The n per condition is 9. Thus:

$$\begin{aligned} \text{HSD} &= 3.53 \sqrt{\frac{7.35}{9}} \\ &= 3.53(0.90) \\ &= 3.18 \end{aligned}$$

Step 4. Referring back to Table 16.4, we find that the differences between \bar{X}_1 vs. \bar{X}_2 and \bar{X}_2 vs. \bar{X}_3 both exceed $\text{HSD} = 3.18$. We may therefore conclude that these differences are statistically significant at $\alpha = 0.05$.

Declaration

This thesis is my original work and has not been presented for degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

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Signature: 

Date of Submission: July, 2006

