

Parent's Attitudes and Behavior, the Learning Environment, and Their Influence on Children's Early Reading Achievement

Salim Abu-Rabia, Inat Yaari

Faculty of Education, University of Haifa, Haifa, Israel
Email: Salimar@construct.haifa.ac.il

Received July 30th, 2012; revised August 30th, 2012; accepted September 7th, 2012

Three different models predict the relationship between parents' attitudes toward reading, their behavior and the learning environment that they provide, and their influence on the reading performance of their children in first grade. The first model specifies the direct influence of each of the independent variables (attitudes, behavior and learning environment) on the dependent variable (reading performance of the child). The second model emphasizes the behavior as mediator between attitudes and reading performance, and also the direct influence of learning environment on performance. In contrast, the third model relates to the influence of attitudes on reading performance, with behavior as a mediator just in a supportive learning environment. In order to examine these models, we investigated a population of fifty first-grade pupils and their parents, measuring these variables with the help of questionnaires, interviews, observations and reading tests. The findings suggest that parents' supportive attitudes have a significant positive influence on the reading performance of their children in first grade. This conclusion is actually consistent with all three models. The more specific conclusion, however, is that attitudes are partially mediated by parents' behavior in a supportive learning environment, which partially supports the third model.

Keywords: Early Literacy; Parental Attitudes; Parental Behavior; Learning Environment

Introduction

Children usually show curiosity in reading and writing activities in rich literacy learning environments. They experience literary activities in their homes and kindergartens. Literacy develops on a daily basis for the sake of accomplishing future literacy skills. Stroud (1995) found literacy props "to be promising in the development and practice of emergent reading and writing skills" (p. 13). Clay (1972) used the term "emergent literacy" to indicate that positive progress has taken place in children's attitudes toward books before they begin to learn reading and writing formally. Children show interest in certain books and from an early age keep asking their parents to read these particular books to them (Feitelson, 1988). Martnez and Roser (1985) argue that children should listen to repeated reading of stories. This type of repeated listening, according to Martnez and Roser (1985), stimulates the various verbal reactions of the children, focuses on different aspects of the story and develops a deep understanding of the story and ultimately better basic academic skills (Abu-Rabia, 2000).

As the first learning environment of children is their home, which can be enriched by the contribution of their close relatives, this study investigates parental attitudes toward reading behavior and toward the learning environment that these parents create, and their influence on the reading achievement of their first-grade children.

Three models are suggested to explain the relationship between attitudes, behavior and learning environment and their influence on the reading achievement of first-grade children. The first model highlights the direct influence of each of the independent variables. The second model highlights the par-

ents' behavior as a mediating factor between attitudes and reading achievement, in addition to a direct influence of learning environment on reading achievement. The third model, however, considers the influence of attitudes on reading achievement with behavior as a mediator only in a supportive learning environment.

Literature Review

Family and Early Reading

The early years of a child's life play a crucial role in the development of knowledge and reading skills, giving the child's home a major influence in this stage of life (Lombard, 1994). Feitelson (1988) argued that certain homes stimulate literacy whereas others do not. The former equip children with literary knowledge that enables them to acquire reading faster than others (Share, Jorm, Maclean, Matthews, & Waterman, 1983). Substantial evidence documented that children who are read to, acquire concepts about the functions of written language in books (Hiebert, 1988; Mason & Allen, 1986). Children also learn that print differs from speech (Smith, 1989) and that print, not pictures, contains the story that is being read. Mason and Allen (1986) observed that "while additional research is needed to identify factors on the causal chain, a reasonable conjecture is that story reading at home makes, if not necessary, contributions to later reading achievement" (p. 29). A number of researchers have argued that there are two types of family variables: family socioeconomic status (SES) (income of parents and education) and process variables (the level of home literacy and parental involvement in children's learning). Their results

indicated that these process variables predicted future reading achievement better than the SES variables (Hess & Holloway, 1983; Scott-Jones, 1984; Toomey, 1986; White, 1982). Other researchers found, however, that SES (income and education of parents) is correlated with reading achievement of children (Burger & Landerholm, 1991; Ho, Sui-Chu, & Willms, 1996); specifically, reading achievement is correlated with processes that occur inside the homes and with parents' education and income. Children from low SES families showed low reading achievement compared to high SES families (Hertzog & Birch, 1971). Furthermore, Davie, Butler and Goldstein (1972) indicated that the educational influence of each parent on their children's reading achievement can add an additional six months to these children's reading age.

Attitudes and Behavior

Attitude is a psychological state that is expressed through agreement or disagreement with a certain situation or value (Eagle & Chaiken, 1993). Attitude has a psychological evaluation state that mediates between the different components that define the object of attitude and the categories of the peoples' reactions (Eagle & Chaiken, 1993). People demonstrate their evaluations of situations through their reactions in various ways: identification with the situation, disagreeing with it, liking it or disliking it. The components of reaction are cognitive (beliefs), affective (feelings toward) and behavioral. Thus, if these are the components that constitute attitudes, then one can assume that there is a relationship between attitudes and behavior.

Zimbardo (1992) highlights the interrelationship between factors that are related to attitudes (attitude system). He suggested looking at attitudes as an evaluation based on cognition, affective reactions, behavioral intentions and prior behavioral intentions and that the attitudes influence cognition, emotional reactions and future behavior intentions (Zimbardo, 1992).

Some scholars argue that there is a reciprocal relationship between attitudes and behavior (Bentler & Speckart, 1979; Faxio, 1986; Festinger, 1957). They argue that people will always try to find some cognitive balance between their attitudes and their behavior. Other scholars (Ajzen & Fishbein, 1977, 1980; Fishbein & Ajzen, 1975), however, argue that the correlations between attitudes and behavior are relatively low because, in their opinion, they reflect the variance between the components that constitute attitudes. Further, they argue that, in order to clarify this relationship, scholars should define and test additional components of the attitude construct as independent components or mediators of the relationship between attitudes and behavior, for example, individual differences, situational differences and habits. Furthermore, to reach a real balance between attitudes and behavior, attitude should be redefined in terms of four elements: action, target, context and time.

Parental Attitudes towards Reading

In the last decade the topic of parental attitudes, beliefs and children's education has attracted the attention of scholars (Goodnow & Collins 1990; Holden & Edwards, 1989; Miller, 1988; Sigal, 1985), but only a few have addressed the relationship between parental attitudes toward reading and children's reading acquisition. Although we do not have documented data, we still can assume that there are differences between families' goals, values and ideas and that such differences might explain

the variance in children's reading experiences (Anderson & Stokes, 1984; Heath, 1983).

The verbal interaction between parent and child is essential in literacy development. The positive feedback of parents on their children's reading enhances children's motivation and stimulates their thinking. Parents who are not involved in their children's literacy development are characterized by their apathy towards their children's reading activities (Payaton, 1972; Penner, 1987; Whitehurst & Valdez-Menchaca, 1988). Some researchers found that parental attitudes toward reading are expressed differently and ultimately perceived by their children (Beech, 1990). Others have found that attitudes of parents affect children's perception of their learning ability, their learning attitude, and their orientation toward learning assignments (Stevenson & Newman, 1986; Eccles, 1983; Parsons, Adler, & Kaczala, 1982). Scarborough and Dobrich (1994) argue in their critical review of the literature that "...no firm conclusion can yet be drawn about the respective roles of parental shared practices and children's attitudes toward literacy in the development of literacy skills. Any complete theoretical account of early literacy acquisition, we feel will almost certainly have spell out the contribution of these two, potentially related, aspects of early development" (pp. 291-292).

Parental Behavior and Reading

The literacy behavior of parents seems to affect—directly and indirectly—their children's reading acquisition (Moon & Wells, 1979). The literary behavior of parents is expressed through reading to their children or creating reading and verbal interaction opportunities for their children (Briggs & Elkind, 1977; Morrow, 1983; Wells, 1985). Reading aloud to children contributes to establishing reading skills, and such behavior also stimulates important classroom discussion, which further enhances reading skills (Hess & Holloway, 1983). Further, parents and children learn and remember stories and parts of stories that enable children to enrich their language and use it when they tell stories and express themselves orally (Snow, Dubber & Deblauw, 1983). Others have found that when 7-year-old children read to their parents, the children improve their reading skills (Hewison & Tizard, 1980; Tizard, Schofield, & Hewison, 1982).

Numerous studies highlight the importance of creating verbal interaction opportunities between parents and children to enhance literacy skills in three ways: arbitrary semantic (to extend and explain children's verbal messages); scaffolding (the need to build-up tasks to ease children's early stages of reading acquisition); responsibility (where parents show accurate and consistent reading activities) (Arnold & Whitehurst, 1994; Dickinson, 1987; Heath, 1983; Goodsit, Ralton, & Perlmutter, 1988; Ninio, 1983; Snow, 1983; Snow & Ferguson, 1978; Scherer & Olswang, 1984; Stevenson & Fredman, 1991; Sorsby & Martlew, 1991; Teale, 1986; Wells, 1985).

There is a widespread agreement that joint parent-preschooler reading is a highly beneficial parental practice that promotes the acquisition of literacy-related knowledge and, consequently, paves the way for successful achievement (Adams, 1990; Goldfield & Snow, 1984; Teale, 1986). Furthermore, pleasurable and purposeful adult-guided parent-preschool reading is a more natural effective means of promoting the acquisition of literacy than are more traditional curricula (Taylor, Blum, & Logsdon, 1986). There are detailed observations that documented parent-

preschool reading activities, suggest wealth of opportunities for acquiring knowledge about reading and writing (Snow & Ninio, 1986; Tylor, 1983). Although these studies support children's benefit in their reading acquisition process, however it is difficult to establish definitive cause-and effect relations from such studies (Scarborough & Dobrich, 1994). Furthermore, Scarborough and Dobrich (1994) argue in a thorough review of the literature that the notion that reading to preschoolers makes an important contribution to literacy development has usually been accepted uncritically. They also discovered that the evidence in support of this assumption was not as strong as they had expected it to be, given the widespread acceptance of this hypothesis (Scarborough & Dobrich, 1994).

Learning Environment as a Mediator between Attitudes and Behavior

From the above literature we can argue that attitudes of parents alone do not determine their children's behavior. The environmental conditions explain from 25% to 40% of the variance of the learning achievement in grade 1 to grade 3 (Bradley & Caldwell, 1984; Gottfried, Gottfried, & Guerin, 1986), and a correlation of 0.35 was found between learning environment and learning achievement (Iverson & Walberg, 1982). Thus, there could be a direct or indirect relationship between learning environment and behavior.

Three factors that influence reading achievement are involved in the definition of the family as a learning environment: the expectations of the parents (Boocock, 1972; Entwisle & Hayduk, 1978; Hess, Holloway, Price, & Dickson, 1982), the availability of reading and writing materials (Briggs & Elkind, 1977; Briggs & Elkind, 1977; Clark, 1976; Durkin, 1966; Flood, 1975; Hansen, 1969; Morrow, 1983), and the creation of learning opportunities (Clark, 1983; Dave, 1963; Heath, 1983; Parkinson, Wallis, Prince, & Harvey, 1982; Wolf, 1964).

Critique on the Research on Family as a Learning Environment

The major critique on the research of family as a learning environment (Williams, 1974, 1976, 1979) is that, although researchers do distinguish between different forces in the learning environment (drives for achievement, language and intellectual environment), they still do not apply these factors in their research. Instead, they are satisfied with global measures of the relationship between family as a learning environment and learning achievement.

The second critique of Williams (1974, 1976, 1979) is that the factors that define family as a learning environment do not stand to be tested via confirmatory factor analysis. He continues that three factors are suggested based on his analysis: expectations of parents for learning achievement, social and physical stimulation that parents convey for their children to promote their learning achievement, and reinforcements that parents give to their children through involvement in reading and learning activities. This categorical division is similar to the categories applied in this study: the educational expectations of parents, the creation of learning opportunities, and the availability of reading and writing materials. Williams' reinforcement factor is tested in this study, however, in relation to behavior and not to learning environment.

The conclusion of Scarborough and Dobrich (1994) based on the reviewed literature, that, can it be said that "...reading aloud

to young children is the most single important activity for building the knowledge required for eventual success in reading? If so, then future research should be focused on pinning down the aspects of shared reading that are most beneficial. If it is not, then perhaps more attention should be directed to identifying and promoting other ways of enhancing children's preparedness for literacy acquisition" (p. 297). This conclusion is relevant to the purpose of our study and motivates its research question and its hypotheses.

The purpose of the present study was to test the relationship between parental attitudes towards reading, behavior and the learning environment that they create and their influence on the reading achievement of their first-grade children.

Research Hypotheses

Based on the reviewed literature, we have tested three models:

1) Parental attitudes towards reading, behavior, and the learning environment that families convey to their children directly affect reading achievement (each variable has a separate independent influence on reading).

2) Parental attitudes and learning environment do not directly affect reading achievement but are mediated via parental behavior. In other words, parental attitudes and learning environment affect reading achievement only when they accompany behavior that supports reading achievement (indirect relationship).

3) Parental attitudes affect reading achievement when they are mediated by behavior, only in environments that support learning.

Method

Participants

The sample consisted of two groups: Fifty first-grade pupils (25 male and 25 female were sampled from two elementary schools), fifty parents of the 50 pupils (44 mothers and six fathers). Then pupils were selected at random from each class. These two elementary schools attracted students from middle to low SES. Most of the parents work in unprofessional jobs.

Tools

Attitude questionnaire of parents toward reading. The questionnaire was adapted from Debaryshe and Binder (1994). The final version consisted of 39 items divided into 6 concepts. Parents were asked to rate their answers on a Likert scale (4 = certainly agree, 3 = agree, 2 = do not agree, 1 = certainly do not agree). The 7 concepts were: *Teaching efficacy* ($\alpha = 0.88$)—tests the parent's active ability to equip his/her child with reading skills, e.g., "As a parent, I have a very essential role in my child's development." This concept consisted of 8 items. *Positive affect* (0.81)—assesses a positive influence of their child's reading habits on the parents, e.g., "Reading aloud is a special time that I like to share with my child." This concept consisted of 11 items. *Verbal participation* ($\alpha = 0.85$)—deals with the importance of verbal behavior of the child as perceived by the parent, for example, "While reading to my child, I want my child to participate with me in telling the story." It consisted of 8 items. *Reading instructions* ($\alpha = 0.86$)—assesses direct instructions in reading by the parents. For example, "While read-

ing I like it when my child points to letters or numbers in the book.” This concept consisted of 3 items. *Knowledge* ($\alpha = 0.84$)—assesses knowledge that the child acquires from books as perceived by the parents, e.g., “Reading helps my child to learn about new things that he/she never experienced”. It consisted of 5 items. *Resources* ($\alpha = 0.80$)—assesses availability of parents for reading aloud to their child. For example, “Usually, I am eager to read to my child, but I am too busy and too tired to do it.” This concept consisted of 4 items. Parents’ behavior. Parents’ behavior was defined according to 4 measures.

1) *Knowledge*: was tested by a questionnaire of writer identification ($\alpha = 0.80$) (Stanovich & West, 1989; Shatil, 1997). A list of 55 names of writers and non-writers was presented and the participant had to identify the real writers; a questionnaire of journal identification (Shatil, 1997) ($\alpha = 0.85$) consisted of 50 real names of journals and other fake names, and parents had to identify the real journal names.

2) Reading habits questionnaire (Beech, 1990) ($\alpha = 0.86$) consisted of nine statements that depict parental reading habits; e.g., “I’d rather watch TV than read a book”. Parents had to answer yes or no. In addition, two more statements were added: “I have a library card,” and “I use the TV weekly directory booklet”.

3) Parental early literacy encouragement ($\alpha = 0.88$). This tool was built for the purposes of this study. It consisted of 6 statements. Parents had to answer statements on a scale from 1 = rarely to 4 = frequently. For example, “I read a book/magazine with my children.”

4) Observation on parental early literacy engagement ($\alpha = 0.86$). This questionnaire was built for the purposes of this study. Seven statements had to be filled out by the observer about the interaction of parents with their children on a scale of 1 - 4, where 4 indicated a high literary engagement and 1 indicated a low literary engagement. For example, “When the parent and child are reading, they discuss issues related to the content of the text”.

Learning Environment

The learning environment is defined by 4 measures:

1) Parental educational expectations (Seginer, 1984) ($\alpha = 0.89$). These were tested by 4 statements that parents had to answer. For example, “What grade can your child optimally achieve?”, “What grades would you like your child to achieve?” “What does good achievement mean for you?” “What is low achievement for you?” Parents had to answer on a scale between 1 = achievement is not too important or I do not know and 4 = very important.

2) The availability of reading materials ($\alpha = 0.91$). This is tested by a list of 6 items; books, cassettes, children’s books, dictionary, computer educational programs and computerized reading programs. The parents had to answer about the availability of these items on a scale from 5 = very much to 1 = not at all.

3) Literary occasions ($\alpha = 0.92$). This concept was tested via six statements that reflect children’s literacy occasions. For example, “My child watches educational TV programs,” “My child talks about stories that have been read to him/her,” “My child listens to taped stories.” The parents had to answer on a scale of 5 = very much to 1 = not at all.

For more statistical information about the tools, means and

standard deviations of variables, factor analysis loadings of variables, and Pearson intercorrelation matrix, see Appendix.

Reading Achievement

Reading comprehension (Artor & Sagev, 1970), consisted of 44 questions: in 24 of the questions, a picture appears with 4 possible answers. The children had to mark the word that matches the picture. Further, 20 written questions were presented with four possible answers, and children had to choose one answer.

Word naming (Balgor, 1968). The list consisted of 24 basic words. Children had to read the words aloud. They were tested for reading accuracy.

Narrative text reading (Greenboim & Lekhter, 1996). The text consisted of 36 words. Children had to read them aloud. They were tested for reading accuracy.

Procedure

The children were assessed in February to give them enough time to adjust to their schooling environment. Each child was tested in two meetings: in the first the following tests were given: word naming, text reading. It took between 10 - 20 minutes for each child to finish the two tests. The children were tested individually. The reading comprehension test, however, was administered collectively for the whole group. The attitudes questionnaire was administered to the parents at their homes while conducting observations and semi-structured interviews.

Results

Hypothesis 1

The first hypothesis tested the influence of attitudes, behavior and learning environment on reading achievement. The assumption was that all variables would affect reading achievement of the children. It was tested via multiple regression analysis when only the emotional dimension of attitudes was tested. The regression model was statistically significant ($F(3,44) = 8.79, p < 0.001$) and predicts 35.3% ($R^2 = 0.355$) of the variance (see **Table 1**). The hypothesis was partially confirmed because only attitudes had a significant effect on reading achievement. Similar results were obtained in the linear and the stepwise regression. The variables, behavior and environment did not reveal any significant effect (For more statistical information about the tools, means and standard deviations of variables, factor analysis loadings of variables, and Pearson intercorrelation matrix, see Appendix).

Table 1. Results of multiple regression analysis of attitudes, behavior and environment on reading achievement.

Variable	Beta	T	P
Attitude	-0.468	3.28	0.002
Behavior	-0.121	.81	0.422
Environment	-0.206	1.64	0.108

Note: *The values of Beta are negative because the reading achievement scores were the number of errors.

Hypothesis 2

The second hypothesis states that attitudes do not influence reading achievement directly but are mediated via behavior but that environment still does affect reading achievement. To test the hypothesis, path-analysis procedure (Schumacke & Lomax, 1996) was employed, and the mediation was tested via the model suggested by Baron and Kenny (1986). To test the mediation, four possibilities should be checked:

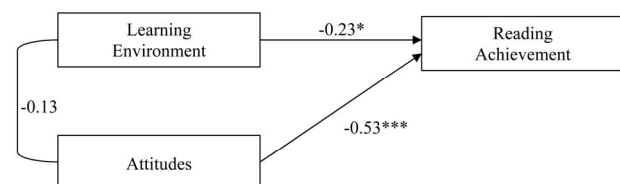
- 1) To test the effect of attitudes on reading achievement in a direct model (see **model 1**). There was a significant correlation between attitudes (emotions) and reading achievement ($r = -0.56, p < 0.0001$).
- 2) To test the effect of the mediating variable, behavior, on reading achievement. The correlation between behavior and reading achievement was ($r = -0.44, p < 0.005$).
- 3) To test the effect of attitudes and behavior on reading achievement in a mediating model (see **model 2**).
- 4) To test the regression in the strength of the direct effect of attitudes on reading achievement between the direct model (**model 1**) and the mediating model (**model 2**).

The regression in the strength of the direct effect indicates the power of the mediating process. Regression of the direct significant effect to a zero effect indicates a full mediating process, whereas regression of the direct significant effect to a level above zero indicates a partial mediating process (Hoyle & Kenny, 1999).

Model 1 tests the direct effect of attitudes and learning environment on reading achievement. The strength of the effect of attitudes on reading achievement will constitute the crucial basis for the mediating model testing (For more statistical information about the tools, means and standard deviations of variables, factor analysis loadings of variables, and Pearson intercorrelation matrix, see Appendix).

This mediating **model 2** tests the joint influence of attitudes and behavior on reading achievement.

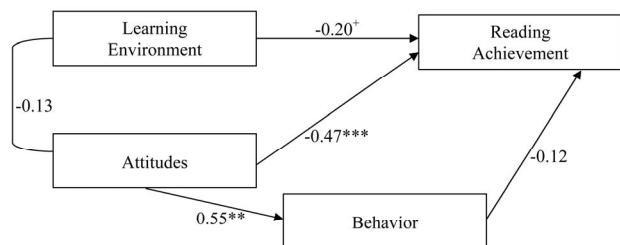
Comparison of **model 1** with **model 2** reveals that the direct significant effect of attitudes on reading achievement becomes



*p < 0.1; *p < 0.05; **p < 0.01

Model 1.

Direct model of attitudes, learning environment and reading.



+p < 0.1; *p < 0.05; **p < 0.01

Model 2.

Mediating model of attitudes, behavior and reading.

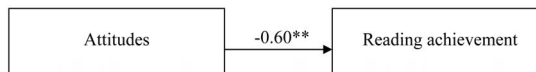
lower, -0.53 to -0.47 , but the correlation is still significant. The explained variance of **model 1** is 28.1%, and it is 22.1% in **model 2**. In other words, there is a significant positive relationship between attitudes of parents and their behavior, but no significant relationship between behavior of parents and reading achievement in **model 2**, which enhances the notion that a partial mediating process is occurring. In addition, the learning environment has a low but significant direct effect on reading achievement (For more statistical information about the tools, means and standard deviations of variables, factor analysis loadings of variables, and Pearson intercorrelation matrix, see Appendix).

Hypothesis 3

The third hypothesis assumes integration between two models: mediator model and moderator model. In other words, behavior (that is supposed to be a predictor of reading achievement) is the mediator of the direct influence of attitudes on reading achievement. This mediating model will exist, however, only in environments that support learning, and other non-supportive learning environments will find this model irrelevant.

To test the third hypothesis, two mediating models were tested: one for learning environment and the second for a non-learning environment. Testing the mediation was done according to the four stages of Baron and Kenny (1986):

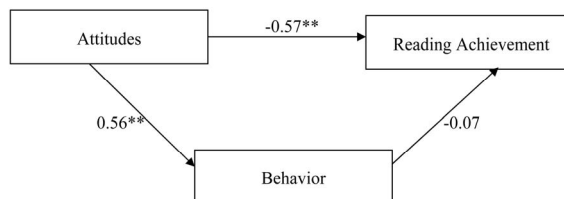
- 1) Testing the direct effect of attitudes on reading achievement regarding all levels of the moderator variable. For a non-supportive learning environment, the correlation between attitudes and reading achievement was significant, $r = -0.60, p < 0.01$ (see **model 3**), and there was a similar result regarding the supportive learning environment ($r = -0.56, p < 0.01$).
- 2) Testing the direct influence of parental behavior on reading achievement regarding all levels of the moderator variable. For the unsupportive learning environment, there was a significant correlation between behavior and reading achievement ($r = 0.39, p < 0.05$), and a significant correlation between supportive learning environment and reading achievement ($r = 0.44, p < 0.05$).
- 3) Testing the joint influence of attitudes and behavior on the reading achievement (see **models 4 and 5**).
- 4) Testing the regression in the direct influence of the attitudes on reading achievement between the direct models (models 3 and 6) and the mediating models (**models 4 and 5**).



*p < 0.05; **p < 0.01

Model 3.

Direct model of the unsupportive learning environment.



*p < 0.05; **p < 0.01

Model 4.

Mediating model of the unsupportive learning environment.

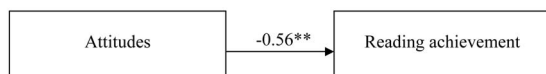
Models 3 and 4 reveal that there is a direct significant influence of attitudes on reading achievement for an unsupportive learning environment. There is no proof for the mediating model, however, as the direct influence of the attitudes on reading achievement remained close to the same value in both models (-0.60 and -0.57). There is virtually no correlation (-0.07), however, between behavior and reading achievement; that is, behavior does not mediate the influence of attitudes on reading achievement. Further, the models also reveal that attitudes have a direct influence on behavior (For more statistical information about the tools, means and standard deviations of variables, factor analysis loadings of variables, and Pearson intercorrelation matrix, see Appendix).

Models 5 and 6 reveal that there is a partial proof for a mediating process. There is a regression in the magnitude of the direct influence of attitudes on reading achievement (-0.56 to -0.45). The explained variance was regressed in models 5 (20.3%) 6 (31.4%) and to 11.1% of the reading achievement explained by attitudes. There is still a significant effect of attitudes on reading achievement and a nonsignificant behavior effect on reading achievement. Thus, the mediating model is partially supported. Attitudes, however, do have a direct effect on behavior.

From the four models we could conclude that the hypothesis was partially supported. It seems that parental behavior is not a mediating variable between attitudes and reading achievement when the learning environment is less supportive. When the learning environment is supportive, however, there is a partial mediating role played by the parents' behavior (For more statistical information about the tools, means and standard deviations of variables, factor analysis loadings of variables, and Pearson intercorrelation matrix, see Appendix).

Discussion

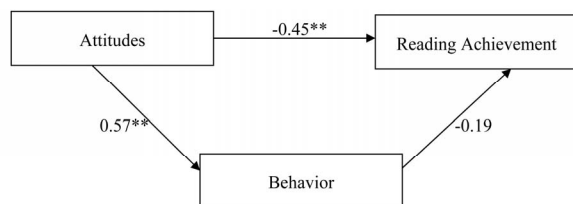
The purpose of this study was to test three models that describe the effect of parental attitudes towards reading, behavior, and the learning environment on their children's reading achievement. The first model highlights the direct influence of each of the variables involved (attitudes, behavior and learning environment) on children's reading achievement. The second model suggests behavior as a mediator between attitudes and reading achievement and a direct influence of learning environment on reading achievement. Finally, the third model ar-



* $p < 0.05$; ** $p < 0.01$

Model 5.

Mediating model for supportive learning environment.



* $p < 0.05$; ** $p < 0.01$

Model 6.

Direct model for supportive learning environment.

gues that attitudes affect reading achievement only when behavior is a mediator in supportive learning environments. The consistent result of this study is that parental attitudes positively affect the reading achievement of first-grade children. Parental behavior and learning environment, however, were not found to be significantly correlated with the reading achievement of first-grade children. This finding partially confirms the first model but raises questions regarding the direct influence of parental attitudes and learning environment on the reading achievement of first-grade children. Because attitudes are constructed of behavioral, cognitive and affective factors (Eagly & Chaiken, 1993; Zimbardo, 1992), it is possible to attribute the influence of attitudes on reading to the mentioned three components of attitudes, but each component alone does not affect reading achievement.

Eagly and Chaiken (1993) highlight the need to trace the processes that affect the relation between attitude and behavior. This is in addition to the focus on the statistical significance of the results. This way, the statistical results become more meaningful. In this regard, there is a need to locate the direction of causality. In other words, do attitudes cause behavior or vice versa? Due to the complexity of the relationship between attitudes and behavior, it has been tested in the literature in different ways: correlations, regression and path analysis. The conclusions regarding this relationship, however, vary according to the type of statistical analysis that was employed (see McGillicuddy-Delisi, 1982a; McGillicuddy-Delisi, 1982b). Additional support comes from testing the second model. It revealed a significant positive relationship between parental attitudes and behavior, but there was a non-significant relationship between parental behavior and reading achievement. Because a lower correlation was revealed between parental attitudes and reading achievement as compared to the first model, we deduce that the mediating hypothesis is partially supported.

According to the above, parental attitudes affect children's reading achievement without the direct mediation of behavior, e.g., hidden and clear messages, not doing reading activities at home, and not providing a positive learning atmosphere. Significant positive correlations were found between attitudes and reading achievement, however, but they were not significantly related to parental behavior (McGillicuddy-Delisi, 1985). Holden and Edward (1989) highlight the role of attitude in affecting children's learning. They argue that parental attitude should be consistent, coherent and should also reflect the behavior of the parents. Other researchers argue, however, that attitudes in relation to reading/learning can be tested without considering the behavior of the parents (Goodnow & Collins, 1991).

It is important to notice that the results of testing **models 1 and 2** showed that the influence of learning environment was not significantly high. In **model 1**, the influence of learning environment was low but significant and in **model 2** (without behavior) it was not significant. This finding enhances the relationship between learning environment and behavior—as two variables that share some common characteristics.

The third model suggests that the behavior mediates the direct influence of attitudes on reading achievement only in environments that support learning. The results revealed that in environments that do not support learning, behavior does not mediate the influence of attitudes on reading achievement. These results partially confirm **model 3**.

Rowe (1991) claimed a relationship between environmental conditions and reading achievement. He tested the relation

between the environmental conditions that families provide for their children, socioeconomic status, home reading activities, and reading achievement. The results revealed that home reading activities directly affect reading achievement, while socioeconomic status did not show a significant influence. In addition, the effect of reading activities on reading achievement at home rises with the age of readers, indicating a cumulative effect on reading achievement (Rowe, 1991). Thus, we can assume that the effect of the supportive learning environment on the relationship between attitudes and reading achievement, which is mediated via behavior, depends on the age at which the reading achievement is tested. This may be because first grade readers are still in stage one of the reading acquisition when the influence of the learning environment is not yet fully evident. After these young readers pass the initial stage of reading acquisition, however, the influence of a supportive learning environment becomes stronger. Finally, Rowe (1991) asserts that it is difficult to reach clear conclusions regarding the factors that influence the reading achievement of young readers not only because of the variety of correlations that have been found between the various factors, but also due to the different data collection methods and the various statistical methods used in the analysis of the data.

In sum, partial confirmation of **model 3** highlights the importance of three variables: attitude, behavior and learning environment and their influence on reading achievement. The overall relationship between them is still not clear, however. Behavior partially mediates between attitudes and reading achievement while the influence of attitudes on reading achievement is direct and statistically significant.

There are two future directions in this research; we suggest investigating the behavior in long-term observations with larger samples. The second approach is to focus more on the cognitive and affective components of attitudes as separate and independent variables affecting reading achievement. There is also a need to test the third model among second and third graders when reading acquisition has already been mastered. Further, there is also a need to test the gender of parents and young readers as an interesting variable that may affect reading achievement.

REFERENCES

- Adams, M. J. (1990). *Beginning to read*. Cambridge: MIT Press.
- Ajzen, L., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84, 888-918. doi:10.1037/0033-2909.84.5.888
- Ajzen, L., & Fishbein, M. (1980). *Understanding attitude and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Alexander, K. L., & Entwisle, D. R. (1988). Achievement in the first 2 years of school: Patterns and processes. *Monographs of the Society for Research in Child Development*, 53, 1-139. doi:10.2307/1166081
- Anderson, A. B., & Stokes, S. J. (1984). Social and institutional influences on the development and practice of literacy. In: H. Goelman, A. A. Oberg, & F. Smith (Eds.), *Awakening to literacy* (pp. 24-37). Portsmouth, NH: Heinemann.
- Arnold, D. S., & Whitehurst, G. J. (1994). Accelerating language development through picture book reading: A summary of dialogic reading and its effect. In D. K. Dickinson (Ed.), *Bridges to literacy* (pp. 103-128). Oxford: Blackwell.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical consideration. *Journal of Personality and Social Psychology*, 51, 1173-1182. doi:10.1037/0022-3514.51.6.1173
- Beech, J. (1990). Parents' attitudes and the reading performance of their children. *Perceptual and Motor Skills*, 70, 1387-1392.
- Bentler, P. M., & Speckart, G. (1979). Models of attitude-behavior relations. *Psychological Review*, 86, 452-464. doi:10.1037/0033-295X.86.5.452v
- Boocock, S. P. (1972). *An introduction to the sociology of learning*. Boston: Houghton Mifflin Co.
- Bradley, R., & Caldwell, B. (1984). The relation of infants' home environment to achievement test performance in first grade: A follow-up study. *Child Development*, 55, 803-809.
- Briggs, C., & Elkind, D. (1977). Characteristics of early readers. *Perceptual and Motor Skills*, 44, 1231-1237. doi:10.2466/pms.1977.44.3c.1231
- Burger, M. L., & Landerholm, E. (1991). A library based program for parents and their preschool children. *Early Child Development and Care*, 70, 37-43. doi:10.1080/0300443910700104
- Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65, 1-21.
- Clark, M. M. (1976). *Young fluent readers: What can they teach us?* London: Heinemann Educational Books.
- Clark, M. (1983). *Family life and school achievement. Why poor black children succeed or fail*. Chicago, IL: University of Chicago Press.
- Clay, M. M. (1972). *Reading: The patterning of complex behaviour*. Auckland: Heinemann Educational.
- Coulmas, F. (1989). *The writing systems of the world*. Oxford: Blackwell.
- Dave, R. H. (1963). *The identification and measurement of environmental process variables that are related to educational achievement*. Ph.D. Dissertation, Chicago, IL: University of Chicago.
- Davie, R., Butler, N., & Goldstein, H. (1972). *From birth to seven*. London: Longman.
- Debaryshe, B. D., & Binder, J. C. (1994). Development of an instrument for measuring parental beliefs about reading aloud to young children. *Perceptual and Motor Skills*, 78, 1303-1311. doi:10.2466/pms.1994.78.3c.1303
- Dickinson, D. K. (1987). Oral language, literacy skills and the response to literacy. In J. Squire (Ed.), *The dynamics of language learning: Research in the language arts* (pp. 147-183). Urbana, IL: National Council of Teachers of English.
- Durkin, D. (1966). *Children who read early*. New York: Teachers College Press.
- Eagly, A., & Chaiken, S. (1993). *The psychology of attitudes*. New York, NY: Harcourt Brace Jovanovich College Publishers.
- Eccles, J. (1983). Expectancies, values and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives: Psychological and sociological approaches* (pp. 75-146). San Francisco, CA: Freeman.
- Ellis, H. (1926). *A study of British genius*. Boston: Houghton Mifflin.
- Entwisle, D. R., & Hayduk, L. A. (1978). *Too great expectation: The academic outlook of young children*. Baltimore, MD: The Johns Hopkins University Press.
- Fazio, R. H. (1986). How do attitudes guide behavior? In R. M. Sorrentino, & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (pp. 204-243). New York: Guilford.
- Feitelson, D. (1988). *Facts and fads in beginning reading*. Norwood, NJ: Ablex.
- Festinger, L. A. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Goldfield, B. A., & Snow, C. E. (1984). Reading books with children: The mechanics of parental influence on children's reading achievement. In J. Flood (Ed.), *Promoting reading comprehension* (pp. 204-215). Newark, DE: International Reading Association.
- Flood, J. E. (1975). *Predictors of reading achievement: An investigation of selected antecedents to reading*. Ph.D. Dissertation, Stanford, CA: Stanford University.
- Goodnow, J. J., & Collins, W. A. (1990). *Development according to*

- parents: *The nature, sources and consequences of parents' ideas*. Hillsdale, NJ: Erlbaum.
- Goodnow, J. J., & Collins, W. A. (1991). Development according to parents: The nature, sources and consequences of parents' ideas. In: H. McGurk (Ed.), *Essays in developmental psychology*. Hillsdale, NJ: Erlbaum.
- Goodsit, S., Ralton, J. G., & Perlmutter, M. (1988). Interaction between mothers and pre-school children when reading a novel and a familiar book. *International Journal of Behavioural Development*, 114, 489-508.
- Gottfried, A. W., Gottfried, A. E., & Guerin, D. (1986). The relationship of early home environment to cognitive ability and achievement in the school entry years. *International Conference on Infant Studies*. Boston, 10 April 1980.
- Hansen, H. S. (1969). The impact of home literacy environment on reading attitude. *Elementary English*, 46, 17-24.
- Heath, S. B. (1983). *Ways with words: Language, life and work in communities and classrooms*. New York: Cambridge University Press.
- Heath, S. B. (1989). The learner as cultural member. In M. L. Rice, & R. L. Schiefelbusch (Eds.), *Teachability of language*. Baltimore, MD: Brooks.
- Hertzog, M. E., & Birch, H. G. (1971). Longitudinal course of measured intelligence in preschool children of different social and ethnic backgrounds. *American Journal of Orthopsychiatry*, 41, 416-426. doi:10.1111/j.1939-0025.1971.tb01128.x
- Hess R. D., & Holloway, S. D. (1983). Family and school as educational institutions. In R. D. Parke (Ed.), *Review of child development research*, 7, *The family*. Chicago, IL: University of Chicago Press.
- Hess, R. D., Holloway, S. D., Dickson, W. P., & Price, G. G. (1984). Maternal variables as predictors of children's school readiness and later achievement in vocabulary and mathematics in sixth grade. *Child Development*, 55, 1902-1912.
- Hess, R. D., Holloway, S. D., Price, G. G., & Dickson, W. P. (1982). Family environments and the acquisition of reading skills: Toward a more precise analysis. In L. M. Laosa, & I. E. Sigel (Eds.), *Families as learning environments for children*. New York: Plenum.
- Hewison, J., & Tizard, J. (1980). Parental involvement and reading attainment. *British Journal of Educational Psychology*, 50, 209-215. doi:10.1111/j.2044-8279.1980.tb00803.x
- Hiebert, E. H. (1988). The role of literacy experiences in early childhood programs. *The Elementary School Journal*, 89, 161-171. doi:10.1086/461570
- Ho, S.-C. E., & Willms, J. D. (1996). Effects of parental involvement on eight-grade achievement. *Sociology of Education*, 69, 126-141. doi:10.2307/2112802
- Holden, G. W., & Edwards, L. A. (1989). Parental attitudes toward child rearing: Instruments, issues and implications. *Psychological Bulletin*, 106, 29-58. doi:10.1037/0033-2909.106.1.29
- Hoyle, R. H., & Kenny, D. A. (1999). Statistical power and tests of mediation. In R. H. Hoyle (Ed.), *Statistical strategies for small sample research*. Newbury Park: Sage.
- Iverson, B. K., & Walberg, H. J. (1982). Home environment and learning: A quantitative synthesis. *Journal of Experimental Education*, 50, 144-151.
- Jae-On, K., & Mueller, W. C. (1978). *Introduction to factor analysis: What it is and how to do it*. Newbury Park: Sage University Papers.
- Jordan, C. (1992). The role of culture in minority school achievement. *The Kamehameha Journal of Education*, 3, 53-67.
- Keeves, J. P. (1986). Motivation and school learning. *International Journal of Educational Research*, 10, 117-127.
- Lombard, A. D. (1994). *Success begins at home. The past, present and future of the home instruction program for preschool youngsters* (2nd ed.). Guilford, CO: The Dushkin Publishing Group, Inc.
- Marjoribanks, K. (1972). Environment, social class and mental abilities. *Journal of Educational Psychology*, 43, 103-109. doi:10.1037/h0032384
- Marjoribanks, K. (1979). *Families and their learning environments: An empirical analysis*. London: Routledge & Kegan Paul.
- Martinez, M., & Roser, N. (1985). Read it again: The value of repeated reading during storytime. *Reading Teacher*, 38, 782-786.
- Mason, J., & Allen, J. B. (1986). A review of emergent literacy with implications for research and practice in reading. *Review of Research in Education*, 13, 3-47.
- McGillicuddy-Delisi, A. V. (1982a). Parental beliefs about developmental processes. *Human Development*, 25, 192-200. doi:10.1159/000272796
- McGillicuddy-Delisi, A. V. (1982b). The relationship between parents' beliefs about development and family constellation, socioeconomic status, and parents' teaching strategies. In L. M. Laosa, & I. E. Sigel (Eds.), *Families as learning environments for children* (pp. 261-299). New York: Plenum. doi:10.1007/978-1-4684-4172-7_9
- McGillicuddy-Delisi, A. V. (1985). The relationship between parental beliefs and children's cognitive level. In I. E. Sigel (Ed.), *Parental belief systems: The psychological consequences for children*. Hillsdale, NJ: Erlbaum.
- Miller, S. A. (1988). Parents' beliefs about children's cognitive development. *Child Development*, 59, 259-285. doi:10.2307/1130311
- Moon, C., & Wells, G. (1979). The influence of home on learning to read. *Journal of Research in Reading*, 2, 53-62. doi:10.1111/j.1467-9817.1979.tb00191.x
- Morrow, L. M. (1983). Home and school correlates of early interest in literature. *Journal of Educational Research*, 76, 221-230.
- Ninio, A. (1983). Joint book reading as a multiple vocabulary acquisition device. *Developmental Psychology*, 19, 445-451. doi:10.1037/0012-1649.19.3.445
- Parkinson, C. E., Wallis, S. M., Prince, J., & Harvey, D. (1982). Research note-rating the home environment of school-age children: A comparison with general cognitive index and school progress. *Journal of Child Psychology and Psychiatry*, 23, 329-333. doi:10.1111/j.1469-7610.1982.tb00077.x
- Parsons, J. E., Adler, T. F., & Kaczala, C. M. (1982). Socialization of achievement attitudes and beliefs: Parental influences. *Child Development*, 53, 310-321. doi:10.2307/1128973
- Payton, N. (1972). *Mother child verbal communication: The relationship between mother question-asking behavior and child response*. MS Thesis, Jerusalem: The Hebrew University.
- Penner, S. G. (1987). Parental responses to grammatical and ungrammatical utterances. *Child Development*, 58, 376-385. doi:10.2307/1130514
- Rowe, K. J. (1991). The influence of reading activity at home on students' attitudes towards reading, classroom attentiveness and reading achievement: An application of structural equation modelling. *Journal of Educational Psychology*, 61, 9-35.
- Scarborough, H. S., & Dobrich, W. (1994). On the efficacy of reading to preschoolers. *Developmental Review*, 14, 245-302. doi:10.1006/drev.1994.1010
- Scherer, N. J., & Olswang, L. B. (1984). Role of mothers' expansions in stimulating children's language production. *Journal of Speech and Hearing Research*, 27, 387-396.
- Schumacker, E. R., & Lomax, G. R. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Erlbaum.
- Scott-Jones, D. (1984). Family influences on cognitive development and school achievement. In E. W. Gordon (Ed.), *Review of research in education*, 11 (pp. 259-306). Washington DC: American Educational Research Association.
- Share, D. L., Jorm, A. F., Maclean, R., Matthews, R., & Waterman, B. (1983). Early reading achievement, oral language ability, and a child's home background. *Australian Psychologist*, 18, 75-87. doi:10.1080/00050068308256241
- Shatil, E. (1997). *Predicting reading ability: Evidence for cognitive modularity*. Ph.D. Thesis, Haifa: University of Haifa.
- Siegel, L. S. (1984). Home environment influences on cognitive development in preterm and full-term children during the first 5 years. In A. W. Gottfried (Ed.), *Home environment and early cognitive development* (pp. 197-233). New York: Academic Press.
- Sigel, I. E. (1985). *Parental belief systems: The psychological consequences for children*. Hillsdale, NJ: Erlbaum.
- Smith, C. B. (1989). Emergent literacy—An environmental concept. *The Reading Teacher*, 42, 528-528.
- Snow, C. E., & Ninio, A. (1986). The contracts of literacy: What children learn from learning to read books. In W. H. Teale, & E. Sulzby

- (Eds.), *Emergent literacy: Writing and reading* (pp. 116-138). Norwood, NJ: Ablex.
- Snow, C. E., & Ferguson, K. (1978). *Talking to children*. New York: Cambridge University Press.
- Snow, C. E., Dubber, C., & DeBlauw, A. (1980). Routines in mother-child interaction. *Annual Meeting of the American Education Research Association*. Boston, 10 April 2012..
- Snow, C. E. (1983). Literacy and language: Relationships during the pre-school years. *Harvard Education Review*, 53, 165-189.
- Snow, C. E., Barnes, W. S., Chandler, J., Goodman, I. F., & Hemphill, L. (1991). *Unfulfilled expectation: Home and school influences on literacy*. Cambridge, MA: Harvard University Press.
- Sonnenschein, S., Brody, G., & Munstermari, K. (1996). The influence of family beliefs and practices on children's early reading development. In L. Baker, P. Afflerbach, & D. Reinking (Eds.), *Developing engaged readers in school and home communities* (pp. 3-20). Mahwah, NJ: Erlbaum.
- Sorsby, A., & Martlew, M. (1991). Representational demand in mothers' talk to preschool children in two contexts: Picture book reading and a modelling task. *Journal of Child Language*, 18, 373-396. [doi:10.1017/S0305000900011119](https://doi.org/10.1017/S0305000900011119)
- Stanovich, K. E., & West, R. F. (1989). Exposure to print and orthographic processing. *Reading Research Quarterly*, 24, 402-433. [doi:10.2307/747605](https://doi.org/10.2307/747605)
- Stevenson, H. W., & Newman, R. S. (1986). Long-term prediction of achievement attitudes in mathematics and reading. *Child Development*, 57, 646-659. [doi:10.2307/1130343](https://doi.org/10.2307/1130343)
- Stevenson, H. W., Chen, C., & Uttal, D. (1990). Beliefs and achievement: A study of black, white, and hispanic children. *Child Development*, 60, 508-521. [doi:10.2307/1131111](https://doi.org/10.2307/1131111)
- Stevenson, J., & Fredman, G. (1991). The social environmental correlates of reading ability. *Journal of Child Psychology and Psychiatry and Applied Disciplines*, 31, 681-698. [doi:10.1111/j.1469-7610.1990.tb00810.x](https://doi.org/10.1111/j.1469-7610.1990.tb00810.x)
- Stroud, J. E. (1995). Block play: Building a foundation for literacy. *Early Childhood Education Journal*, 23, 9-13. [doi:10.1007/BF02353373](https://doi.org/10.1007/BF02353373)
- Takagi, S. F. (1975). Responses of three-year-old children to storytelling of a Japanese picture book. *Science of Reading*, 18, 105-113.
- Teale, W. (1986). Home background and children's literacy development. In W. Teale & E. Sulzby (Eds.), *Emergent literacy* (pp. 173-205). Norwood, NJ: Ablex.
- Tizard, J., Schofield, W. N., & Hewison, J. (1982). Collaboration between teachers and parents in assisting children's reading. *British Journal of Educational Psychology*, 52, 1-15. [doi:10.1111/j.2044-8279.1982.tb02498.x](https://doi.org/10.1111/j.2044-8279.1982.tb02498.x)
- Toomey, D. M. (1986). Involving parents in their children's reading. *Collected Original Resources in Education*, 10, 1-70.
- Taylor, D. (1983). *Family literacy: Young children learning to read and write*. Exeter, NH: Heinemann.
- Taylor, N. E., Blum, I. H., & Logsdon, D. M. (1986). The development of written language awareness: Environmental aspects of and program characteristics. *Reading Research Quarterly*, 21, 132-149. [doi:10.2307/747841](https://doi.org/10.2307/747841)
- Wells, G. (1985). *Learning, language and education* (pp. 74-99). Philadelphia, PA: Nfer-Nelson.
- White, K. R. (1982). The relation between socio-economic status and academic achievement. *Psychological Bulletin*, 91, 461-481. [doi:10.1037/0033-2909.91.3.461](https://doi.org/10.1037/0033-2909.91.3.461)
- Whitehurst, G. J., & Valdez-Menchaca, M. C. (1988). What is the role of reinforcement in language acquisition? *Child Development*, 59, 430-440. [doi:10.2307/1130322](https://doi.org/10.2307/1130322)
- Williams, T. (1974). *Competence dimensions of family environments*. AERA Annual Meeting, Chicago, IL, 10 April 2012.
- Williams, T. (1976). Abilities and environments. In W. H. Sewell, R. M. Hauser, & D. L. Featherman (Eds.), *Schooling and achievement in American society*. New York: Academic Press.
- Williams, T. (1979). *Another view*. Unpublished manuscript. Australian Council for Educational Research, Melbourne.
- Wolf, R. (1964). *The identification and measurement of environmental process variables related to intelligence*. Unpublished Ph.D. Thesis, Chicago, IL: University of Chicago.
- Zimbardo, P. (1992). *The psychology of attitude change and social influence*. New York: McGraw Hill.

Appendix

Table 2.
Means and Standard Deviations of Attitudes.

Attitudes	X	SD	Min	Max
Teaching efficacy	3.31	0.3	2.44	3.92
Positive effect	3.42	0.4	2.45	4.00
Verbal participation	3.32	0.4	2.25	4.00
Reading instruction	2.65	0.7	2.33	4.00
Knowledge	3.35	0.4	2.60	4.00
Resources	3.45	0.6	1.50	4.00
Learning environment	2.60	0.6	1.50	4.00

Note: 4 = certainly agree, 1 = certainly do not agree, n = 50.

Table 3.
Factor Analysis Loading of the Attitudes.

	Tools/Techniques	Affection
Verbal participation	.90	.15
Knowledge	.78	.28
Reading instruction	.76	-.02
Resources	-.11	.92
Positive effect	.88	.31
Teaching efficacy	.75	.64
Eigenvalue	2.53	2.27
R ₂ %	42.1%	3.78%

Table 7.
Pearson Intercorrelation Matrix, Attitudes, Behavior, Environment.

Variables	(1)	(2)	(3)	(4)	(5)
1) Attitudes-tools/technique	0.40**				
2) Attitudes-affection	0.13				
3) Behavior that promotes reading	0.33*	0.15			
4) Achievement		-0.56***	-0.09		
5) Learning supportive environment		-0.44**	0.55***	0.00	
	-0.29*				

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, n = 50.

Table 4.
Factor Analysis Loadings of the Behavioral Variables.

Behavior	Behavior that promotes reading
Self report	-.77
General knowledge in the field	.76
Observations	-.25
Frequency of behavior	.70
Eigenvalue	1.72
R ₂ %	43.1%

Table 5.
Factor Analysis Loading of the Environmental Variable.

Environment variables	Learning environment
Expectations	.88
Availability of tools/material	.75
Literary occasions	.31
Eigenvalue	1.44
R ₂ %	47.8%

Table 6.
Factor Analysis Loading of the Achievement Variable.

Achievement variables	Achievement
Reading comprehension	.96
Reading aloud (words)	.94
Reading aloud (text)	.89
Eigenvalue	2.60
R ₂ %	86.5%