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Accelerated Reader: The Relation To Age Of Entry Into Formal Education

Tiffani Long
Fort Hays State University

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ACCELERATED READER: THE RELATION TO AGE OF
ENTRY INTO FORMAL EDUCATION

being

A Field Study Presented to the Graduate Faculty
of the Fort Hays State University in
Partial Fulfillment of the Requirements for
the Degree of Education Specialist

by

Tiffani Long

M.S., Fort Hays State University

Date _____

Approved _____
Major Professor

Approved _____
Chair, Graduate Council

ABSTRACT

The current study examined the relationship between ages of entry into formal education and the effects it had on participation in the Accelerated Reader program. More specifically, the variables being compared were: the child's age in months, gender, average number of AR points accumulated, the number of quizzes passed, and finally the number of quizzes taken. It was hypothesized that those children who are younger than their peers are going to earn fewer points than their older peers. Additionally, a gender difference was also hypothesized, predicting that female students would earn more points than their male classmates.

Data was gathered from the 2009-2010 school year from two small elementary schools in mid-west Kansas, each enrolling students kindergarten through fifth grades. Results of the independent samples t-test revealed significant differences between the two schools at the 2nd, 3rd, and 4th grades on total points earned ($M_{School 1}=45.86$, $M_{School 2} = 63.92$), quizzes passed ($M_{School 1}=30.79$, $M_{School 2}=70.61$), and quizzes taken ($M_{School 1}=34.11$, $M_{School 2}=77.00$). To further investigate these findings, results were sorted by grade level and another independent samples t-test was performed. In 2nd grade, the total number of points accumulated ($M_{School 1}=42.27$, $M_{School 2} = 52.13$), quizzes passed ($M_{School 1}=59.08$, $M_{School 2} =103.51$) and quizzes taken ($M_{School 1}=66.24$, $M_{School 2} =110.21$) were significantly different, while in 3rd and 4th grades the only significant findings were the quizzes passed (3rd Grade: $M_{School 1}=24.80$, $M_{School 2}=70.35$, 4th Grade: $M_{School 1}=8.62$, $M_{School 2} = 36.63$) and quizzes taken (3rd Grade: $M_{School 1}=26.86$, $M_{School 2}=79.30$, 4th Grade: $M_{School 1}=9.31$, $M_{School 2} =40.55$). Additionally, a Pearson's Correlation

revealed a positive, linear relationship between age in months in 4th grade, quizzes passed, and quizzes taken. Finally, an independent samples t-test was used to determine if there were any significant differences between genders only revealing a difference on average percent correct.

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INTRODUCTION

A popular topic among parents of young children is the correct age to begin formal education. The popularity of this topic could, in part, be due to anecdotal stories indicating that children who are held back a year before starting kindergarten outperform their peers in the classrooms. Like parents, social scientists are interested in empirically determining if delaying age of entry into kindergarten, sometimes referred to as “academic red-shirting,” has potential benefits to children. Specifically, research in this area has examined varying ways that delayed entry could benefit a child including: self-constructs, social-constructs, academic predictors, physical and psychological well-being, and classroom dysfunctions. In order to better understand the complex relationship between age of entry into kindergarten and potential benefits, the relevant literature in the respective areas will be reviewed. Following this review, information will be provided on participation in Accelerated Reader (AR); a topic that has received very little attention in relation to age of entry into formal education.

There are many different aspects of self-construct that can be used as a tool in determining whether or not a child is ready to begin formal education. One important and highly researched aspect is self-regulation. Matthews (2008) notes that self-regulation involves not only staying on task and modulating emotions, but also cognitive processes such as sustaining attention. These components to self-regulation involve voluntary and conscious processes (Bronson, 2000), hence age of child is an important predictor of self-regulating behaviors.

Research on the topic has also investigated how self-regulation influences the learning environment (Normandeau & Guay, 1998). Results indicate that children's ability to engage in self-control, concentrate on a task, and pick-up on the routine of school; are important factors in academic achievement overall (Alexander, Entwisle, & Dauber, 1993; Kendall, 1993). Thus, one could conclude that delaying age of entry into formal education could have a positive impact on the child due to increases in self-regulating behaviors.

Social constructs is a second factor to consider in this discussion. When looking specifically at the effects of social-constructs and the age in which a child begins formal education, there does not appear to be any differences between normal or later entry (Lincove & Painter, 2006; Loeb, Bridges, Bassock, Fuller, & Rumberger, 2005; Sarosky, 2009). However, when the social-constructs are paired with other variables, relationships emerge (Peisner-Feinberg, Burchinal, Clifford, Culkin, Howes, Kagan, & Yazejian, 2001; Ladd, Birch, & Buhs, 2003; Spitzer, Cupp, & Parke, 2002). For instance, academic self-concept was found to directly contribute to the development of antisocial behaviors in early adolescence (Pisecco, Wristers, Swank, Silva, & Baker, 2001) and deficits in a child's self-oriented social skills significantly predicted peer victimization, which then predicted depressive symptoms (Perren & Alsaker, 2009). Stapel and Tesser (2001) also found that activating self-constructs elicits social norm concerns. Thus, social-constructs and self-perceptions of children can influence peer relations.

There are a handful of studies indicating that later entry into formal schooling

positively influences academic measures. Barua and Lang (2008) used an instrumental variable estimation strategy and found that children who started formal schooling a year later perform better on test scores compared to younger children in the same grade. In addition, these children who were a year older were 19 % less likely to be retained a grade. Cromwell (1998) also observed that children with delayed entry into kindergarten were less likely to have repeated first or second grade, and received less negative feedback from teachers in regard to their academic performance. West, Meek, and Hurst (2000) also reported that parents of children with delayed entry were less likely to receive negative feedback from teachers and those children were half as likely to repeat a grade as those children who entered on time or early.

While research shows that academically there are some positive effects for delaying entry into kindergarten as mentioned above (Baru & Lang, 2008; Cromwell, 1998; West, et al., 2000), it has also been shown that delaying age of entry has no academic advantages (Grissom, 2004; Martin, 2009; Stipek & Byler, 2001) and if advantages do exist, they dissipate rather quickly. For example, research has found that by third or fourth grade any advantages for children entering school at a later age are gone (Bickel, Zigmond, & Strayhorn, 2004; Stipek & Byler, 2001). Similarly, Oshima and Domaleski (2006) found that any academic differences with regard to age of entry were apparent only through fifth grade. Other factors such as socio-economic status appear to be related to the issue, although the direction of the relationship is not clear. Specifically, Elder and Lubotsky (2009) found that the advantages based on entrance age

were very pronounced in upper income families, while there is also research showing that these effects are more prevalent among disadvantaged, or high risk children (e.g., Leuven, Lindahl, Oosterbink, & Webbink, 2010). Finally, age of entry into formal education is related to special education services for a child. Martin, Foels, Clanton, and Moon (2004) not only showed lower achievement of summer born children (June – August), but also greater rates of Specific Learning Disability diagnosis.

It should be noted that there is even research indicating that early entry into formal education, rather than late entry, has benefits. For example, Black, Devereux, and Salvanes (2008) conducted a study using the population data from Norway, and found evidence for a positive effect of starting school younger on IQ scores when measured at age 18. Similarly, Dobkin and Ferreira (2007) also found that younger children tend to have a higher academic attainment. Finally, a study by *Early Education and Development* (2007) revealed higher scores for children who entered kindergarten at younger ages on the Woodcock-Johnson Letter-Word Recognition subtest, with family background factors and early child-care experience controlled for in the first 54 months.

As demonstrated in this review, the literature on age of entry into formal education and potential benefits is conflicting. While some research denotes positive effects (e.g., Baru & Lang, 2008; Cromwell, 1998; West, et al., 2000), there are an equal number of studies illustrating no benefits or potential negative consequences (e.g., Grissom, 2004; Martin, 2009; Stipek & Byler, 2001). One area that has not been researched is how age of entry into kindergarten influences participation in AR. The

Renaissance Learning website describes the AR program in the following way:

Accelerated Reader (AR) is a computerized, personalized practice and progress monitoring tool that provides reliable and valid feedback on comprehension of books and other materials students have read. For students, this feedback is motivational. For teachers, the information is used to carefully monitor and guide each student's independent reading practice. This includes guiding students to books at appropriate levels, closely monitoring their progress, and intervening with appropriate instruction when necessary. Guided independent reading practice has been shown to accelerate reading growth for all students, regardless of ability (www.renlearn.com).

Generally, AR is adopted by schools and children earn points for demonstrating comprehension of books they have read. Schools also frequently promote the AR program and encourage student participation by providing prizes to children based on the number of points earned within specific periods of time.

There are many studies looking at the effectiveness of AR, including the use of experimental and quasi-experimental research. The *Renaissance Learning* website makes the majority of these studies easily accessible on their website (www.renlearn.com). For example, Paul, Vanderzee, Rue, and Swanson (1996) compared a representative sample of 2,500 grade school, middle school, and high school students whose schools owned the AR program to 3,500 students that were similar in geographic location and demographics whose schools did not own the AR software. Results indicated that on every subject test

including reading, math, science, social studies, and writing, the schools who had the AR program performed significantly better than those schools that did not have the AR program. Similarly, Carter (1996) found that AR may increase standardized test scores. When studies look at the effects of the AR program on reading comprehension, there appears to be an overall, positive effect. Johnson and Howard (2003) found that as long as the AR program was used daily, it proved effective in improving comprehension and vocabulary. Children who read under grade level benefited the most from the program; however they had the lowest level of participation on a daily basis. Facemire (2000) also found a significant positive effect on reading comprehension among 3rd graders who used the AR program for 9 weeks, compared to another 3rd grade class in the same school that did not use the program. Cuddeback and Ceprano (2002) concluded that AR was successful in improving young emergent reader's comprehension when it was used along with other materials and teaching procedures.

While the website provides the research supporting the AR program, there are several studies that argue the opposite; an overall lack of experimental evidence and questioning of the effectiveness of the program (e.g., Biggers, 2001; Krashen, 2002, 2003, 2005). Motivation and achievement are other highly researched areas that are questioned among the AR program (e.g., Bert, 2005; Bouche, 2008; Thompson, Maduri, & Taylor, 2008). For example, Carter (1996) found that AR, among other computerized reading management programs, not only decreases motivation for reading, but also places less emphasis on the practice of reading, limits the material selection, discourages

independent selection of books, and puts an emphasis on testing rather than books themselves. Trevino-Diaz (2009) conducted a qualitative study examining the AR program and its influence on students. The findings suggest that the program can be a great source for reading motivation. However, in addition to just the program, it requires other support including family, peer, or teachers to influence the passion of students to read more. When reading comprehension is considered by itself, the results tend to point to significant gains (Bryant, 2008), however; when looking at reading achievement growth among two groups of fifth-grade students where one group used the AR program for one year, and the other did not, results showed that those who used the program scored significantly lower than those who did not use the program on a pretest-posttest measure (Melton, Smothers, Anderson, Fulton, Replogle, & Thomas, 2004). When looking at children who participated in independent reading compared to AR, Toro (2001) found that there was no difference in comprehension among a second grade class over a six week time frame.

Electronic Bookshelf, Reading Counts!, and Book Adventure are just a few other reading programs out there, although AR appears to be the most popular. Both Electronic Bookshelf (EBS) and Reading Counts are very similar to the AR program with a few minor differences. EBS, Reading Counts, and Book Adventure allow for test retaking where AR only allows for a test to be taken once. EBS also allows for the point value of a book to be changed by the teacher, while AR's point value of a book remains the same for consistency and fairness. Similarly, AR does not allow the teacher to change the number

of correct answers in order to pass a test. Some teachers prefer Electronic Bookshelf over AR simply because it gives them flexibility to meet the individual needs of students.

Reading Counts, also has a 30 item test bank available per each title so the same questions are not asked each time. On Book Adventure, the children accumulate points based on their quiz percentage and then trade them in for prizes.

In a study done by Trueb (2010), Reading Counts and AR were compared on literacy improvement among at-risk elementary students. Trueb used a sample of students from a school in Missouri which had regularly performed below-average in literacy and reading comprehension on the standardized Missouri Assessment Programs test. Results suggested that both programs improved the reading skills of at-risk elementary students. Brown (2008) compared AR with sustained silent reading among 108 sixth grade students that attended two different schools in Tennessee. Data were gathered from the Tennessee Comprehensive Assessment Program for three consecutive years beginning in the 2004-2005 school year. Brown found that the students who used the AR program had a significant increase in their reading-language arts scale score for three consecutive years.

As can be seen from the current literature review, both the topics of age of entry into formal education and success of reading programs such as AR have resulted in an extensive body of knowledge. However, no research to date has explored how age of entry into school is related to participation in AR. This topic is worth investigating for several reasons. First, early entry into education could create a situation where a child may not be socially and emotionally mature enough to function in the classroom,

adversely affecting their academic performance, specifically reading. Next, with the results of this research, we can see the importance of why the Accelerated Reader program needs to be implemented differently across grade levels and gender, as previous research has revealed differing motivations between males and females (Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992).

The purpose of the current study was to explore the relationship between age of child and participation in the AR program. It was predicated that children who are chronologically younger than their peers will earn fewer points than their peers who are older. A gender difference between boys and girls was also predicated. This prediction was made because the bulk of previous research points to girls outperforming boys in their reading abilities. Specifically, it was hypothesized that girls were going to obtain more points than their male classmates (Gates, 1961; Johnson 1973; Logan & Johnston 2009).

METHOD

Participants

Data was collected from the 2009-2010 school year from two Midwestern elementary schools. Data consisted of each enrolled child's age in months, sex, number of AR points accumulated for the entire academic year, average percent correct on quizzes, the number of quizzes passed, and the number of quizzes taken. Though every student enrolled in each school was entered into the Accelerated Reader database, data of children with disabilities, not capable of participating in the program, and those children not taking the tests in English were excluded as an attempt to obtain more accurate results of the population.

Statistics from the previous year, taken from the National Center for Education Statistics (NCES) 2008-2009, provided useful information on the demographics of the first elementary school. First, the student- teacher ratio was 16 to 1. This was slightly higher than the state average of, 14 to 1. Of the student body, 88 % were- Caucasian, 5 % were Asian/Pacific Islander, 5 % were Hispanic, 1% were American Indian, and less than 1 % were African American. The state average of students qualifying for free and reduced lunches was 43%, and 38% of the students from this school qualified. In terms of performance on standardized tests, for the third and fourth grades, 100% of students met or exceeded standards on the reading standardized test. The state average was 84% for third grade and 86% for fourth grade. Ninety-one percent of fifth grade students met or exceeded these standards and the state average was 84%.

School 2 had a slightly lower student- teacher ratio than school 1, though equal to the national average at 14 to 1. The student body was made up of 88% Caucasian, less than 1% Asian Pacific Islander, less than 1% Hispanic, less than 1% African American, and less than 1% two or more races. Of the student population, 41% received free or reduced lunches which is 2% lower than the national average. Identical to school 1 on the reading standardized test, 100% of the students met or exceeded standards in the 3rd and 4th grades, while 80% of students in the 5th grade met or exceeded standards, 11% less than the performance of school 1 (NCES 2008/2009).

Though the statistics of each school are very similar, the administration of the AR program was slightly different. In school 1, the students began completing Accelerated Reader quizzes during their Kindergarten year, whereas school 2 did not allow students to participate in the AR program until their 2nd grade year. The grade allowed to begin testing was the only known difference in the administration; all other aspects appeared to be constant, noting that the attitudes of the teachers at each school were unable to be obtained.

Materials and Procedure

Permission was obtained from the AR Director and Principals of the schools to collect data (see Appendix A). There was no identifying information on a specific child collected. To help protect the welfare of the children, permission was obtained from the Internal Review Board (IRB) at FHSU. The IRB reviewed my research protocol and granted permission to collect the desired information. In addition, the information

provided to the researcher on AR activity was already collected by the AR program and stored by the elementary school.

Finally, a two part survey was constructed for the teachers in an attempt to discover the attitudes of the teachers towards the Accelerated Reader program (see Appendix B). The first survey asked how long he/she had been teaching and what grade he/she currently teaches. Along with these questions, teachers had to determine how they felt towards specific aspects of the AR program by using a 4-point Likert scale ranging from “I have *never* felt this way” to “I have felt this way *often*”. The second part of the survey also used a Likert scale with 7-points ranging from “*very* satisfied” to “*very* dissatisfied” in response to how satisfied he/she is with specific features of the AR program. Before the teachers were given surveys, they were required to sign and date an informed consent page (see Appendix C) agreeing to participate in the study. Afterwards, a debriefing statement was administered to each participant (see Appendix D).

RESULTS

Prior to data analysis, general frequencies were calculated to determine the average number of points earned, average percent correct, quizzes passed, and quizzes taken by grade level (See table 1). First, a series of independent samples t-test were performed to compare the two schools at the second, third, and fourth grades before the data was collapsed for further investigation. The independent samples t-test were conducted to determine if points earned, average percent correct, quizzes passed, and quizzes taken varied between the two schools. Although there were no significant differences on the average percent correct, there were significant differences between the schools and total points earned, $t(2) = -2.22, p < .05$, quizzes passed, $t(2) = -8.79, p < .001$, and quizzes taken, $t(2) = -8.72, p < .001$. See table 2 for means and standard deviations of schools on each variable.

As a result of finding unexpected differences between the schools, another series of independent sample t-test were performed. The results were sorted by grade level to determine if the differences between the schools were being driven by a difference at a specific grade level. In second grade, there were significant differences in the average percent correct, $t(89) = -2.05, p < .05$, the quizzes passed, $t(89) = -6.11, p < .001$, and quizzes taken, $t(89) = -5.61, p < .001$, while the total points earned was not significant. At the third grade level there was a significant difference found between the schools on quizzes passed, $t(76) = -8.63, p < .001$, and quizzes taken $t(76) = -8.32, p < .001$. The total points earned and the average percent correct were not significantly different. In

fourth grade, the number of quizzes passed, $t(88) = -8.14, p < .001$, and quizzes taken, $t(88) = -8.89, p < .001$ were again significant, while the total points earned and the average percent correct were insignificant. See table 3 for means and standard deviations. Due to the fact that very few differences between the schools existed for percent correct, the schools were collapsed for further data analysis.

A series of correlations were conducted to examine the relationships between age in month by grade levels and the variables of: total points earned, average percent correct, quizzes passed, and quizzes taken. Results indicated that there are no correlations in kindergarten, first, second, and third grades. However, age in months during fourth grade positively correlated with quizzes passed, $r(89) = .264, p < .01$, as well as quizzes taken, $r(89) = .250, p < .01$.

Finally an independent samples t-test was conducted to examine gender differences between total points earned, average percent correct, quizzes passed, and quizzes taken. The average percent correct was the only significant difference that was found, $t(3) = -2.01, p < .05$. See table 4 for means and standard deviations.

DISCUSSION

Although there is no previous research when looking at the age of entry into formal education and its effects on the Accelerated Reader program, research consisting of early education as a whole has yielded conflicting results in regards to which is more beneficial for a child, early versus delayed entry. Research in support of early entry into formal education reports findings such as higher IQ scores when measured at the age of 18 (Black et al., 2008), an over-all higher academic attainment (Dobkin & Ferreira, 2007), and finally higher scores on the Woodcock-Johnson Letter-Word Recognition subtest when early childcare experience and family background factors were controlled for in the first 54 months, or 4 ½ years (*Early Education and Development*, 2007).

When discussing delayed entry, there is research revealing positive effects of delaying entry into formal schooling as well as studies indicating negative effects of delayed entry. For example, Barua and Lang (2008), Cromwell (1998), and West et al. (2000) found that later entry into formal education positively influenced academic measures, while Grissom (2004), Martin (2009), and Stipek and Byler (2001) showed that delaying age of entry had no academic advantages. Additionally, there is research supporting that if differences were found they more often than not dissipated by third, fourth, and fifth grades (Bickel et al., 2004; Oshima & Domaleski, 2006; Stipek & Byler, 2001). Socioeconomic status was another factor that appeared to be related to this topic though it is unclear as to the direction of the relationship (Elder & Lubotsky, 2009; Leuven et al., 2010).

The purpose of the present study was to explore the relationship between a child's age in months and their participation in the AR program, which led to looking specifically at the total number of points earned, the average percent correct on AR tests, the number of quizzes passed, and the number of quizzes taken. It was expected that chronologically younger students would earn fewer points than their classmates, as well as a gender difference with the expectation that girls would obtain more points than their male classmates. This prediction was made in conjunction with previous research suggesting that girls more commonly obtain higher scores on reading assessments (e.g., Gates, 1961; Johnson 1973; Logan & Johnston 2009) and older children are more socially adjusted for the classroom setting and tend to reach higher scores on academic measures (e.g., Barua & Lang, 2008; Cromwell, 1998; Ladd, et al., 2003; Spitzer, et al., 2002; West et al., 2000).

Results of this study did not reveal any significant differences among the younger and older students of each grade until the fourth grade. In fourth grade the results indicated a significant positive correlation in the number of quizzes passed as well as the number of quizzes taken, partially supporting the hypothesis. These results are contrary to previous research findings suggesting that differences start to dissipate in later grades (Bickel et al., 2004; Oshima & Domaleski, 2006; Stipek & Byler, 2001), however, when Piaget's stages of cognitive development are taken into account, they help to elucidate these findings.

Jean Piaget's stages of cognitive development progress in age from birth through

adolescence. Though the ages he presents are variable to each person, the sequence of stages will remain the same. While Piaget presents four stages in his theory of cognitive development, only the second and third stage are pertinent to the interpretation of these findings. During the second stage, the preoperational stage, which begins when the child starts to talk and lasts until around age seven, the child is applying his/her new knowledge of language and also using symbols to represent objects. This symbolic thinking moves beyond connecting sensory information to physical actions. The third stage is the concrete operational stage which lasts until early adolescence. During this stage the child is learning to think abstractly and reason logically (Piaget, 1983). Tadlock (1980) takes into account Piaget's stages of cognitive development in relation to reading, explaining that the concrete operational thought comprises an important and necessary contingency for being able to read. She describes the preoperational stage as missing multiple characteristics and complex relationships when using symbols to make sense of language. Tadlock makes the claim that print, on the other hand, requires forming these relationships and making mental comparisons to uncover any similarities and differences that have to be discovered through reason. With the understanding that these stages of cognitive development are progressively reached, and that the age in which a stage is reached is based upon on the rate of progression of each individual child, this fact is a great indicator as to why differences were found in fourth grade between the number of quizzes passed and the number of quizzes taken and not previous grades. Generally speaking, children in fourth grade range from 102 to 112 months, which is the same age

in which children are slowly progressing through the concrete operational stage.

When gender was taken into account, the results showed findings in support of the hypothesis that females had a higher average percent correct on the AR quizzes than their male peers. These findings may be explained, in part, due to motivation. A previous study conducted by Vallerand et al. (1992) showed the differences in motivation between males and females. The authors discussed three different types of motivation including, intrinsic motivation, extrinsic motivation, and amotivation. The study conducted by Vallerand et al. (1992) uncovered that males scored higher on amotivation (individuals who are neither intrinsically nor extrinsically motivated, and experience feelings of incompetence and uncontrollability), while females scored higher on the extrinsic motivation-regulation subscale (associated with regulating behavior by using rewards and/or constraints) and significantly higher on all three measures of intrinsic motivation than did males. With the explanation that females tend to be more intrinsically motivated while males are more commonly amotivated may be an indicator as to why females had a significantly higher average percent correct on AR tests than the males. These gender differences coincide with previous research showing that females generally outperform males in areas of reading, as well as their attitudes towards reading and their attitudes toward school (Logan & Johnston 2009).

Though differences between the schools were not predicted, the numbers of quizzes passed and quizzes taken were consistently significantly different at each grade level between the two schools. These differences are thought to stem from the fact that

school 2 does not allow their students to begin participating in the Accelerated Reader program until the second grade, while school 1 allows their students to start participating in the program in kindergarten. Delaying participation may build up a heightened excitement and eagerness to participate explaining the higher numbers in school 2. The cultural diversity between the two schools varied minutely, with school 1 having a more diverse enrollment. The two schools are consistent in the sense that they use the same AR director so for the most part the implementation of the program should be very consistent between the schools. Additionally, the data that was taken from both schools came from every child that completed AR quizzes. These numerous similarities provide more support for the hypothesis that delaying participation may increase rates in later years.

An additional factor that may help explain the differences between the two schools is that school 1 is reading higher level books by the time they are in 2nd grade and averaging six points per book, where as school 2 at 2nd grade is starting at the beginning level of the AR program averaging two points per book. By reading smaller books, school 2 is able to read more books in a shorter amount of time, which provides an explanation as to why they have significantly more quizzes passed and quizzes taken. Additionally, by the time the students from school 2 get to 4th grade they still have many options of book titles to choose from, while school 1 who has been reading AR books since Kindergarten, is going to be more limited in their options.

A primary limitation involved in this study is that teacher input from each school and grade level was not obtained. The dispositions and attitudes of teachers toward the

accelerated reader program may be impacting the attitudes of their students in one direction or another. There is a large body of research indicating that teacher dispositions will strongly impact student learning and achievement (Collinson, Killeavy, & Stephenson, 1999; Combs, 1974). Additionally, the National Council for the Accreditation of Teacher Education (NCATE) has integrated professional disposition into their standards to become an accredited institution. Part of NCATE's definition of professional disposition taken from Hallam (2009) includes, "Professional attitudes, values, and beliefs demonstrated through both verbal and non-verbal behaviors as educators interact with students, families, colleagues, and communities. These positive behaviors support student learning and development... (p. 27)."

Another limitation related to this study is that correlations were used to determine any relationships between age and total points earned, average percent correct, the number of quizzes passed and the number of quizzes taken. Due to correlations being the only statistic used there are no grounds for determining that age was the cause for any of the previously mentioned variables. The only inferences that can be made from the results of the correlations is that there is a strong positive relationship between age in months while in fourth grade and quizzes passed and taken. A final limitation is a threat to type I error (i.e., rejecting the null hypothesis when it is actually true, Bonds-Raacke & Raacke, 2012). Alpha was set at .05 for each statistic that was conducted and multiple t-tests were performed. Although the number of analyses increased the risk for type I error, the study is exploratory in nature and future research needs to be conducted to replicate the

findings.

Despite the limitations involved with this study, the data collected and the results obtained add to the body of research and may be beneficial in helping to assist educators in determining how to implement AR at varying grade levels and across genders. For instance, as a result of males more commonly being amotivated and having poorer attitudes towards reading, devising an activity that makes male students realize reading does not have to be negative may help with their attitude. Also, this research extends body on knowledge of how age of entry into formal education impacts other factors. Additionally the results of this study add to the knowledge of gender differences in academia.

In light of the aforementioned data, future research should take into account the existing literature on the topic of teacher's disposition impacting achievement and attitudes. Due to this topic being so significant in the area of education and achievement, obtaining the attitudes and beliefs of different classroom teachers where data is being collected is highly recommended. If the current study was able to obtain that additional data it may have provided a more definitive explanation for the differences that were found between the two schools.

Additionally, by extending this research into the fifth and sixth grades it will show if the trend lines tend to level off as a result of the younger students finally graduating the concrete operational stage, or if major differences really become apparent as the reading content and specific content required to remember become increasingly more difficult.

Other theorists posit that differences that come about in later grades can be attributed to a negative reading attitude and a lack of reading pursuit that stems from the Accelerated Reading program being used as a motivational tool early on (Bouche, 2008; Pavonetti, Brimmer, & Cipielewski, 2003; Thompson, Madari, & Taylor, 2008). Thompson et al. (2008) found that AR proved to be counterproductive among adolescence stating that “The results suggest that reading reform strategies that may work at the elementary level may not be as effective for adolescents, and that in order for true high school and reading reform to occur, the views and unique needs of older students must be examined and taken more seriously” (abstract).

Moreover, future research should take into account those students who take their accelerated reader tests in another language. For instance, in the current study, data from those students who completed their AR tests in another language was not controlled for which may have skewed the results, especially with school 1 being more diverse. The Accelerated Reader program allows tests to be taken in either Spanish or English. However, even if second language learners are proficient in reading in their native language, they tend to resort to poor reading strategies such as incorrectly sounding out words, a difficult process that can make reading tiresome which also inhibits their ability to retain what they have read (Law & Eckes, 1990).

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Table 1

Mean Values of Dependent Variables by Grade Level

<u>Grade</u>	<u>Points Earned</u>	<u>Percent Correct</u>	<u>Quizzes Passed</u>	<u>Quizzes Taken</u>
Kindergarten	2.77	82.25	6.04	6.78
First	24.38	90.96	45.75	46.63
Second	48.01	85.34	84.96	91.85
Third	45.86	84.19	49.91	55.77
Fourth	73.19	82.61	24.49	27.01

Table 2

Means and Standard Deviations of Dependent Variables by School

<u>Total Points Earned</u>	<u>Mean</u>	<u>Standard Deviation</u>
School 1	45.86	70.38
School 2	63.92*	60.15
<u>Average Percent Correct</u>		
School 1	83.31	12.36
School 2	84.61	10.67
<u>Quizzes Passed</u>		
School 1	30.79	30.62
School 2	70.61***	39.78
<u>Quizzes Taken</u>		
School 1	34.11	33.51
School 2	77.00***	43.03

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Means and Standard Deviations of Dependent Variables by Grade Level per School

2nd Grade	<u>Mean</u>	<u>Standard Deviation</u>
<u>Total Points Earned</u>		
School 1	42.27	29.65
School 2	52.13*	22.43
<u>Average Percent Correct</u>		
School 1	83.14	10.88
School 2	86.92	6.71
<u>Quizzes Passed</u>		
School 1	59.08	30.38
School 2	103.51***	36.69
<u>Quizzes Taken</u>		
School 1	66.24	33.28
School 2	110.21***	39.28
3rd Grade	<u>Mean</u>	<u>Standard Deviation</u>
<u>Total Points Earned</u>		
School 1	38.44	49.31
School 2	51.90	22.74
<u>Average Percent Correct</u>		
School 1	83.52	10.90
School 2	84.73	9.05
<u>Quizzes Passed</u>		
School 1	24.80	21.33
School 2	70.35***	24.59
<u>Quizzes Taken</u>		
School 1	26.86	21.11
School 2	79.30***	32.05

Table 3 Continued

4th Grade	<u>Mean</u>	<u>Standard Deviation</u>
<u>Total Points Earned</u>		
School 1	56.02	106.15
School 2	86.31	93.93
<u>Average Percent Correct</u>		
School 1	83.29	14.98
School 2	82.09	14.30
<u>Quizzes Passed</u>		
School 1	8.62	9.79
School 2	36.63***	19.69
<u>Quizzes Taken</u>		
School 1	9.31	9.59
School 2	40.55***	20.27

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Means and Standard Deviations of Dependent Variables by Gender

<u>Total Points Earned</u>	<u>Mean</u>	<u>Standard Deviation</u>
Male	43.12	60.77
Female	46.99	58.99
<u>Average Percent Correct</u>		
Male	83.57	10.32
Female	86.07*	12.98
<u>Quizzes Passed</u>		
Male	46.88	42.47
Female	45.65	38.48
<u>Quizzes Taken</u>		
Male	51.75	46.02
Female	48.56	41.20

* $p < .05$, ** $p < .01$, *** $p < .001$

APPENDIX A: Institutional Consent Form

Dear Principal and Accelerated Reader Committee,

Hello. My name is Tiffani Long. I am currently a graduate student at Fort Hays State University in the School Psychology program. One of the requirements of my master's degree is completion of a thesis. My thesis topic is on the relationship between age of entry into formal education and participation in the Accelerated Reader Program. My hypothesis based on previous research is that children who are chronologically older will earn more AR points in a given school year and that these differences will likely dissipate by fourth or fifth grade.

I am writing you to ask for assistance in gathering data for my thesis. Specifically, I am looking to obtain the following information: age of child in months, gender and total accumulated AR points for the 2009-2010 school year for all grades at your school participating in the AR program. Please note that I am not requesting any identifying information and thus a specific child cannot be linked to responses. To help protect the welfare of the children, I have obtained permission from the Internal Review Board (IRB) at FHSU. The IRB has reviewed my research protocol and granted me permission to collect the desired information.

In addition, the teacher of each grade will be given the option to fill out a self-constructed survey pertaining to the Accelerated Reader program to help extend my research. When results are obtained, information will be shared with the scientific community in aggregate form and will contain no names or identifying information.

Your participation will help us learn more about topic areas in school psychology, in particular Accelerated Reader. You may choose to stop your participation in this study at any time. You will not receive financial compensation for your participation. There are no costs for participating in this study other than the time the teachers will spend completing the survey. There is no outside funding for this research project.

It is unlikely that participation in this project will result in harm to participants. It is unlikely that you are at risk for psychological, legal, physical, social harm or any risk that is more than minimal. However, should anyone feel distressed or become upset by participating; they may contact the Psychology Department Ethics Chair, Dr. Janett Naylor at jmnaylor@fhsu.edu.

Again, your assistance is invaluable. If you are interested in the results of my findings, please let me know.

Tiffani Long
email: talong@scatcat.fhsu.edu
phone: (785) 216-0126

CONSENT:

I have read the above information about Accelerated Reader: The Relation to Age of Entry into Formal Education, and grant the researcher permission to collect the specified information from my school. By signing this, I agree to release the Accelerated Reader records with no identifying information and allow the researcher to survey teachers in the agreed upon manner. I have been given a copy of this signed consent document for my own records. I understand that I can withdraw my consent at any time. By signing this consent form I am not giving up my legal rights. I am 18 years or older.

Principal's signature and date

AR's signature and date

APPENDIX B: Teacher Survey

SURVEY

What grade do you teach? _____

How long have you been teaching?

_____ 1- 10 years

_____ 11-20 years

_____ over 20 years

Indicate how often you have felt the way described in each statement using the following scale:

4 = "I have felt this way *often*."

3 = "I have felt this way *sometimes*."

2 = "I have felt this way *rarely*."

1 = "I have *never* felt this way."

___ 1. Students are **not** allowed to retake quizzes.

___ 2. Accelerated Reader provides children with incentives upon completing goals.

___ 3. The grade level of a book **cannot** be changed by the teacher.

___ 4. Children must pass quizzes made up by Accelerated Reader in order to obtain points.

___ 5. The number of correct answers on a quiz **cannot** be changed to determine what is passing.

___ 6. Children can only choose from books that are within their Accelerated Reader grade level.

___ 7. The same questions are asked for each book title.

___ 8. Children are required to obtain a specified number of points within a certain time frame.

___ 9. The point value of a book **cannot** be changed by the teacher.

___ 10. The competition to obtain points in Accelerated Reader is motivating for the child.

Please rate on the following scale how satisfied you are with the following features of the Accelerated Reader program.

7 = Very satisfied

6 = Satisfied

5 = Somewhat Satisfied

4 = Undecided

3 = Somewhat Dissatisfied

2 = Dissatisfied

1 = Very Dissatisfied

___ 1. Accelerated Reader is the best program out there.

___ 2. The children benefit in many academic areas due to their participation in Accelerated Reader.

___ 3. Accelerated Reader can be overwhelming at times.

___ 4. I do not see how Accelerated Reader is any more successful than independent reading.

___ 5. I question the effectiveness of Accelerated Reader.

___ 6. I feel that younger students in my class are more successful in the Accelerated Reader program.

___ 7. I question how this program benefits a child's reading abilities.

___ 8. Children who have been retained are more successful in the Accelerated Reader program.

___ 9. I can see in the children's reading abilities that Accelerated Reader produces great

results.

___ 10. If I had the choice, I would continue to use the Accelerated Reader program with each student.

___ 11. The Accelerated Reader program requires a lot of work on behalf of the teachers and staff.

___ 12. Parties are a great way to motivate children to read.

___ 13. I find that student's read more when incentives are provided.

___ 14. I feel that older children in my classes are more successful in the Accelerated Reader program.

___ 15. Children performing under grade level appear to benefit most from Accelerated Reader.

APPENDIX C: Informed Consent Form

CONSENT TO PARTICIPATE IN RESEARCH

Department of Psychology, Fort Hays State University

Study title: Accelerated Reader: The Relation to Age of Entry into Formal Education

Name of Researchers: Tiffani Long

Contact Information: talong@scatcat.fhsu.edu

Name of Faculty Supervisor & Contact Information, if student research:

Dr. Jenn Bonds-Raacke

Email: jmbondsraacke@fhsu.edu

Phone: 785.628.4403

You are being asked to participate in a research study. It is your choice whether or not to participate. Your decision whether or not to participate will have no effect on your work-related duties, evaluation of your job performance, or services to which you are otherwise entitled. Please ask questions if there is anything you do not understand.

What is the purpose of this study? The purpose of the study is to investigate the relationship between the age of a child and participation in the Accelerated Reader program.

What does this study involve? If you decide to participate in this study, you will view a survey and answer questions about the survey. You will not be required to provide your name or any other identifying information. If you decide to participate in this research study, you will be asked to sign this consent form after you have had all your questions answered and understand what will happen to you. Consent forms will be stored separately from survey responses. After completing the survey, the survey will be collected and you will be read a debriefing statement. The length of time of your participation in this study is 10 minutes. Approximately 70 participants will be in this study.

Are there any benefits from participating in this study? There will be no benefits to you should you decide to participate in this study. Your participation will help us learn more about topic areas in school psychology, in particular Accelerated Reader.

Will you be paid or receive anything to participate in this study? You will not receive financial compensation for your participation.

What about the costs of this study? There are no costs for participating in this study other than the time you will spend completing the survey.

What are the risks involved with being enrolled in this study? It is unlikely that participation in this project will result in harm to participants. It is unlikely that you are at risk for psychological, legal, physical, social harm or any risk that is more than minimal. However, should you feel distressed or become upset by participating; you may contact the the Psychology Department Ethics Chair.

How will your privacy be protected? No names or identifying information will be asked. Responses to survey questions will be entered into a computer program and stored for 5 years, after which the data will be deleted. Original survey documents will be shredded after the information is entered into the computer program. Only the student researchers and faculty advisors will have access to the database. Results of the survey will be shared with the scientific community through presentation and possible publication. When results are shared, information will be presented in aggregate form and will contain no names or identifying information.

Other important items you should know:

- **Withdrawal from the study:** You may choose to stop your participation in this study at any time.
- **Funding:** There is no outside funding for this research project.

Whom should you call with questions about this study? Questions about this study can be directed to the Ethics Chairperson in Psychology: Dr. Janett Naylor at jmnaylor@fhsu.edu or the faculty advisor of this study: Dr. Jenn Bonds-Raacke at jmbondsraacke@fhsu.edu. If you have questions, concerns, or suggestions about human research at FHSU, you may call the Office of Scholarship and Sponsored Projects at FHSU (785) 628-4349 during normal business hours.

CONSENT

I have read the above information about Accelerated Reader: The Relation to Age of Entry into Formal Education and have been given an opportunity to ask questions. By signing this I agree to participate in this study and I have been given a copy of this signed consent document for my own records. I understand that I can change my mind and withdraw my consent at any time. By signing this consent form I understand that I am not giving up any legal rights. I am 18 years or older.

Participant's Signature and Date

APPENDIX D: Debriefing Statement

Debriefing

The purpose of the current study is to investigate the relationship between the age of a child at entry into formal education and participation in the Accelerated Reader program. It is predicted that children who are chronologically younger than their peers will earn fewer points than their peers who are older. A gender difference is also predicted. Specifically, it is hypothesized that girls are going to obtain more points than their male classmates within a designated academic year.

The responses that you provided on the survey will be viewed in aggregate form and will be used to help interpret the research findings. It is predicted that teachers at younger grade levels will rate age of entry into formal education as more of an important factor in the use of AR than teachers at older grade levels. If you would like the results from this study, we would be happy to provide you with a copy of them. No names or identifying information would be on the results.

We do not predict any adverse effects due to participating in this study. However, if after participating in this research, you are feeling distressed in any manner, the following resources can offer you professional support and counseling.

School Psychologist (this will be filled in for each individual school)

Name:

Phone:

Email:

If you have questions or concerns about your rights as a participant, you may contact faculty supervisor, Dr. Bonds-Raacke at jmbondsraacke@fhsu.edu or (785) 628-4403, or myself, Tiffani Long, at talong@scatcat.fhsu.edu or (785) 216-0126.

Thank you for your participation!