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The Effects of a Token Reward System on Reading Comprehension

Sarah Boyer

Abstract

In our educational system today, a student's academic success is the result of good classroom management and self-reinforcement. While some students can achieve success in school due to intrinsic motivation, others may need more. Reading comprehension skill is essential for the early education years and is critical in all aspects of a student's life. The aim of this study was to analyze the relationship between a token reward system and reading comprehension scores. This study was structured as a quasi-experimental AB design and included two separate phases over a course of 12 weeks with 12 middle school participants. Phase A was a six-week treatment phase in which a token reward system was implemented to test its effects on reading comprehension scores. Phase B was the second half of the study, where the token reward system was discontinued and reading comprehension scores continued to be monitored. Data was collected and analyzed on the effects the token reward system had on reading comprehension scores using a paired sample t-test. This author hypothesized that with the implementation of a token reward system, the participants' combined reading comprehension scores would increase. Results showed a significant difference in reading comprehension scores between Phase A and Phase B, in which during Phase A with the implementation of a token reward system, reading comprehension scores increased.

Achieving academic success in school is something to which most students strive. The foundation of this academic success is one's reading ability. Reading ability provides the foundation for success in cross-content areas such as math and social studies. (Yuvaci & Demir, 2016). Results from the most recent administrations of the NAEP (National Assessment of Educational Progress), found that more than 60% of eighth graders and 60% of twelfth graders scored below proficiency levels in literacy achievement (Haynes, 2016). Many students with a behavior disorder are usually one to two years behind their peers academically (Hopewell, McLaughlin, & Derby, 2011). This includes discrepancies in most core subjects such as math, writing, and reading. Previous research has shown that in society today, many Americans struggle with reading comprehension, which is one of the first skills taught in elementary school (Papatga & Ersoy, 2016). A national study done on 7,900 fourth graders showed the results that less than 1/3 of those participants were reading at or above grade level (Daly, Bonfiglio, Mattson, Persampieri, & Foreman-Yates, 2005). One of the goals as an educator is to provide quality instruction and assist students in learning (Barbetta, Norona, & Bicard, 2005). This may help improve not only comprehension, but fluency as well (Taguchi, Gorsuch, Takayasu-Maass, & Snipp, 2012). A student can become successful at reading comprehension, which is the understanding of what was just read, by using a variety of strategies such as repeated reading and computer based programs (Papatga & Ersoy, 2016). In elementary schools and middle schools, most students prefer to use technology and electronic text rather than read printed books (Ciampa, 2012).

Issues with Comprehension

The No Child Left Behind Act was implemented to close the achievement gap to ensure no child is left behind, and that all public students perform at grade level in reading proficiency. Unfortunately, about 69% of students in the fourth-grade cannot read at grade level (Wanek, Wexler, Vaughn, & Ciullo, 2009). Only 3% of direct instructional time is focused on coaching and teaching students about different reading comprehension strategies that are necessary to understand the text (Ness, 2007). One of the goals as an educator is to provide quality instruction and assist students in learning (Barbetta, Norona, & Bicard, 2005). Teaching academic skills such as reading comprehension can contribute to achievement in other subjects, including math and science (Akbash, Sahin, & Yaykiran, 2016). Education is an important aspect of anyone's life, and skills learned in school are used lifelong. Education prepares students to enter the world with necessary reading, writing, and social skills. However, eleven percent of all adults living in the US are non-literate, and an additional 13-20%

lack basic reading skills (Kutner, Greenberg, Jin, Boyle, Hsu, & Dunleavy, 2003). Many students may struggle with multiple aspects of reading, including comprehension, word-recognition and repetition. These students may need more than one intervention to address difficulties in reading (Hulme & Snowling, 2011).

Past Research on Reading

How effective a person is with reading comprehension is directly correlated with other academic skills & factors. A study completed in 2015 focused on four different factors that impacted reading comprehension (Gentaz, Sprenger-Charolles, & Theurel, 2015). Three hundred ninety-two children living in France from 30 different schools were selected to participate in a study examined four different factors and their impact on reading comprehension. These four factors were decoding, vocabulary knowledge, listening comprehension and phonemic awareness. Participants were categorized into three different groups based on their decoding ability. Two hundred sixty-seven students were identified as being average decoders ($M = 27.91$; $SD = 6.72$), 63 students were found to be good readers ($M = 45.88$; $SD = 7.90$), and 63 were poor ($M = 10.87$; $SD = 4.17$). Results from the t-test indicate decoding skills (12.10% of the participants) are most effective in improving reading comprehension, followed by listening (7.28%), then vocabulary (4.57%) and lastly phonemic awareness (3.34%).

Teaching contingency-based strategies and interventions can assist students with not only maintaining appropriate classroom behavior but can also help increase academic performance. Gatti (2011) studied the effects of SuccessMaker for students in the fifth and seventh grade. These strategies consist of self-monitoring skills and self-recording skills; both encourage growth and maintenance of academic success (Reiber & McLaughlin, 2004). Another strategy suggested by the WWC (What Works Clearinghouse) is to offer computer-based courses that would be an extension of students' direct, in class, reading instruction. SuccessMaker, one example of these computer-based strategies teaches students how to improve in multiple areas of reading, including comprehension.

Gatti's study took place in seven different states and 641 fifth grade students participated in this study. Of those participants, 342 of those fifth graders received the intervention SuccessMaker and 299 received the regular literacy/language arts program. Out of the 453 seventh-graders, 254 of those seventh-graders received the SuccessMaker intervention, and 199 received the regular literacy/language arts program. Results for the intervention group of fifth graders had an overall $SD = 12.93$, and the comparison or control group has an overall $SD = 12.75$. Within the seventh grade, the intervention group had an $SD = 14.00$, and the comparison/control group had an $SD = 16.07$ and $p < .001$. The WWC calculated the p-value and determined that there was neither a positive or negative significant effect on reading comprehension. While this study's results were insignificant, nonetheless, computer-based interventions to assist with reading comprehension is just one of many strategies educators can use.

Kutner et al. (2003) completed a study with 13 different measures that were used to assess word recognition, reading fluency and oral language skills. One of the measures used in this study was to assess the number of correctly read words per minute, across four different passages. There were 476 adult participants who read at or below the seventh-grade level. All participants completed between one and 12 years of schooling and 29% of those adult participants received special help with reading during their school years. The results of this study showed that four of the 13 measures were significantly discrepant. The mean of the participants reading fluency was 95 correct words per minute, which is what is expected of a third or fourth grader. Participants scored at the first-grade level when it came to basic phonemic decoding. Results of this study suggest that despite participants' age and experience with the English language, the sum of vocabulary levels ($SD = 14$) and oral comprehension language ($SD = 16$), and reading fluency ($SD = 25$) were only slightly higher than their reading levels. These findings support the claim that reading comprehension is a skill necessary to be literate as an adult, and supports the notion that teaching basic reading skills is necessary.

Despite past research on using computer-based strategies to teach reading comprehension, the use of technology and computer based programs may not be appropriate or widely available. The purpose of reading should be comprehension; the ability to obtain information from text (Sackstein, Spark, & Jenkins, 2015).

When a student is able to comprehend what they are reading, there is a higher probability the student will be able to either relate to what was read or personally tie it to themselves (Camargo & Navarro, 2010). This allows for a connection to be made as students are reading, and there would be more of an interest in reading for middle school students. According to an academic guide, direct instruction in reading comprehension should be taught at a younger age, even before word skills are clearly established (Shanahan, Callison, Carriere, Duke, Pearson, Schatschneider, & Torgesen, 2010).

Token Reward Economies

Motivation is a key component of good classroom management, promoting appropriate behaviors, and achieving academic success (Ihiegbulem, Ihiegbulem, & Igwebuike, 2011). Token reward systems consist of presenting a reward contingent on behavioral or academic improvement. This token reward system can be designed for either whole groups or individuals (Reiber & McLaughlin, 2004). Tokens should be motivating incentives to the students, and be rewards students look forward to working for. (Ihiegbulem, Ihiegbulem, & Igwebuike, 2011). When educators disregard the quality of work and only provide rewards based on completion of a number of tasks or appropriate behavior, this results in limited and negative effects on post-treatment academic achievement (Deci, Koestner, & Ryan, 2001).

Sran and Borrero (2010) looked at the effects of offering a choice of multiple token rewards. The study included four, four-year-old preschool participants who were being tested to see if having choices of edible tokens would influence academic achievement. This study was a combined reversal and multi-phase design. During the first phase, no rewards were given and a baseline was collected. During the second part of the phase, each participant first rated, on a scale of one through five, what their most preferred item was, prior to the assessments. Available tokens were one fruit snack, one piece of candy, one marshmallow, one cookie and one piece of chocolate.

For the no-choice condition, participants worked a red worksheet and exchanged their token for the most preferred item on their list. During the single-choice condition, participants worked a yellow sheet and exchanged their tokens for five, identical edible items, such as different colored fruit snacks. The experimenter gave the participant the opportunity to choose only one piece of those five, colored fruit snacks. For the varied choice condition, participants worked a blue sheet and exchanged their token for one of five items (Sran & Borrero, 2010).

The results of this study are as follows: the baseline of participants had a mean of .044, which suggested: "there was no reinforcement effect when the edible items were available, but participants were not allowed to choose" (Sran & Borrero, 2010). One participant had a 42% preference for the varied choice conditions, another participant had an 81% strong preference for the varied choice conditions, and results indicated that all four participants preferred a token reward system in which they had the ability to choose their reward. According to Stockdale & Williams (2004), when utilizing a token reward system, there should be a reward contingency, meaning the token is given out when appropriate behavior is displayed.

While there is a great amount of research on the different types of methods used to teach reading comprehension and the effects of token rewards on behavior, this author believes more research is needed when it comes to studying the connection between a token reward system and academic achievement in a single subject area, such as reading comprehension. This study focused less on the specific method of testing reading comprehensions [IE: computer based verse textbook], but more on the effects a reward system had on increasing comprehension scores.

Purpose Statement

When it comes to reading comprehension, vocabulary is not a significant factor in mastering reading comprehension of adults with a low rate of literacy (Kutner, et al., 2003). It is important to utilize an abundance of different instructional techniques when assessing reading comprehension. Out of these different instructional methods or interventions, the reinforcement method has shown to be more effective in academic achievement (Gao & Ma, 2006). There needs to be a wider area of research on the relationship between a reward system and increasing overall reading comprehension.

This study focused on whether or not the implementation of a token reward system affected students' academic achievement on weekly reading comprehension scores. Data was collected and analyzed over a twelve-week period using an AB, quasi-experimental design, with twelve middle school participants. This author hypothesized that with the implementation of a token reward system, there would be an increase in the combined participants' reading comprehension scores during the treatment phase, and once the treatment was discontinued, reading comprehension scores would decrease.

Methods

Participants

This study took place in an Eastern Iowa public school district with 120,689 students. All participants were in an off-site, tier three, behavior-focused program that was located within a public school. While there are different tiers of behavior focused programs, tier three/level three is the most restrictive due to behavior concerns. Participants were given a ten-minute oral introduction and explanation of this author's research proposal. Information given to the students consisted of this author's proposed research question, an explanation of what a token reward system is, what three tokens were used during this study, and a breakdown of how the study would be completed. At the end of the introduction, each of the participants was given a piece of paper that allowed them to check a box marked 'yes' or 'no' indicating whether they wanted to volunteer to be a participant. All twelve participants agreed voluntarily to be a part of this study. Out of the twelve participants, eleven were males and one female. Of the eleven male participants, three were Caucasian and eight were African American; the female participant was African American as well. Out of the twelve participants, two were in the sixth-grade, seven were in the seventh-grade and three were in the eighth-grade. The participants' ages ranged from eleven to thirteen years old, with the average age being twelve. Each of the twelve participants had an IEP with different goal areas: behavior, math, reading, and writing. Of the twelve participants, 91% were on a free and reduce lunch due to socio-economic status, and 100% of the participants came from a family where only one parent was involved.

Materials

CBM Maze Probe Passages. This study utilized MAZE comprehension passages. (Figure 1). The CBM Maze passages included a short, multiple choice task in which students read the passage silently to themselves for three minutes, and at different intervals within the passage, there were three words inside the parenthesis. The participants had to choose which of the three given words would fit the best in that sentence. The CBM Maze Passages were used for progress monitoring due to the Maze Passages being time-efficient, easy to administer and allows the educator to track progress throughout the school year (Tolar et al., 2012).

Data Collecting Spreadsheet. To promote independence and responsibility, participants were required and reminded to use the Data Collecting Spreadsheet (Figure 2). On the spreadsheet, the participant would record two pieces of information: their correct number of chosen responses and their preferred choice token reward. Using this spreadsheet encouraged the skill of self-monitoring, or having the ability to critique the

quality of one's own work (Sharma & Bewes, 2011). During this study, participants' self-monitoring allowed them to track and observe their reading comprehension scores over the course of twelve weeks.

Token Rewards. Whenever the participant increased the number of correctly chosen words from one week to the next, the participant had the opportunity to choose one of three possible token rewards. The use of the token rewards has been known to yield positive effects on motivation for students (Adibsereshki, Abkenar, Ashoori, & Mirzamani, 2014). Three possible tokens were used in this study that allowed participants to choose a reward based on their preference. The three choices of tokens were: one PARRT ticket, 100+ bonus points or one colorful pencil. A system was in place throughout the school, and the PARRT acronym stands for Personal Best, Active Listening, Respect, Responsibility and Trustworthiness. Both the PARRT ticket and 100+ bonus points could be exchanged for a tangible item in the school store.

Measures

Number of correctly chosen words. The CBM Maze Probe consisted of passages that contained approximately 250 words, with the seventh word deleted and a choice of three possible answers given in parenthesis. Students read the passage and choose the correct words they come across in their reading. Data was collected on a weekly basis and each participant's number of correctly chosen words was recorded on the data tracking spreadsheet.

Change in scores from week to week. Due to this study's design as an AB, quasi-experiment, each participant acted as their own control group. Each individual participant recorded their number of correctly chosen words on the data tracking spreadsheet. Tracking changes from week to week allowed participants to track their individual progress and showed the effectiveness of the token reward system. See Table 1 through 4 to see week to week progress that was made for the combined participants' reading comprehension scores.

Participants' choice of token rewards. When a participant achieved a higher score in the number of correctly chosen words from one week to the next, they were able to choose one of three token rewards. The three choices of tokens were: one colorful pencil (1CP), 100+ bonus points (BP) or one PARRT ticket (1PT). The participant's choice of token was then recorded on the data tracking spreadsheet. The PARRT ticket could be exchanged for an item in the school store.

Procedure

This study included two phases that occurred over a period of twelve weeks. Prior to the start of the study, participants were told that a reward would be provided if they increased the number of correctly chosen words on a reading comprehension probe from one week to the next.

During Phase A, the first six-weeks of implementing a token reward system, on Wednesdays, each participant was given a MAZE Passage Probe and had three minutes to read the passage. While reading, participants were required to choose the correct word that best fit the sentence.

This author scored the participants' individual scores that afternoon, and then participants recorded their score on the data tracking spreadsheet the following day. After recording their score, participants returned the data tracking spreadsheet to this author who maintained it until the following week.

If a participant increased their number of correctly chosen words from the previous week, they were allowed to choose one of the three token rewards; a PARRT ticket, 100 Bonus Points or one colorful pencil. Once a token was chosen, each participant was given their file folder and were asked to record which token they had chosen.

During Phase B, the last six-weeks of this study, the token reward system was discontinued, but participants were still given the MAZE Passage probe each Wednesday and were still required to record their number of correctly chosen words. This allowed each participant to visually see his or her scores throughout the twelve-week study.

Data Analysis

Reading comprehension scores were measured by using CBM Maze Probe Passages. Data was collected and analyzed at the start and end of each phase. The first six weeks, known as Phase A, consisted of the implementation of a token reward system to test its effects on improving reading comprehension scores. Before week one of treatment, baseline scores were established, against which the combined participants' scores could be compared throughout the duration of the study. The second six-weeks, known as Phase B, is when the token reward system was discontinued, but reading comprehension scores continued to be tracked.

The main focus during the study was collecting data on the combined participants' overall reading comprehension scores. A paired sample *t*-test was used to compare the participants' baseline and post-treatment scores.

Results

During the first six-weeks of the study, also known as Phase A, a token reward system was implemented. The paired samples *t*-test suggested a significant difference between the beginning and end of Phase A, $t(11) = -17.16$; $p < .001$. The mean for baseline scores was 13.67 (SD = 5.22) and the mean for week 6, the last week of treatment, was 28.92 (SD = 4.98). This data indicated that the participants' combined reading comprehension scores at the end of Phase A, ($M = 28.92$; $SD = 4.98$) had significantly increased compared to the baseline scores ($M = 13.67$; $SD = 5.22$).

During the last six-weeks of the study, known as Phase B, the token reward system was discontinued. The paired samples *t*-test suggested a significant difference between the beginning and end of Phase B, $t(11) = 15.34$; $p < .001$. The means scores for Week 7 was 26.57 (SD = 5.05) and the means score for Week 12 was 15.58 (SD = 5.299). This data indicates that the participants' combined reading comprehension scores at the end of Phase B decreased significantly after the token reward system was discontinued after Week 6.

Table 1
Phase A Descriptive Statistics

Treatment	<i>M</i>	<i>SD</i>	<i>n</i>
Baseline	13.67	5.228	12
Week 1	15.92	4.926	12
Week 2	18.17	5.237	12
Week 3	20.08	5.600	12
Week 4	22.75	5.029	12
Week 5	25.75	4.634	12
Week 6	28.92	4.981	12

Table 2
Phase B Descriptive Statistics

Treatment	<i>M</i>	<i>SD</i>	<i>N</i>
Week 6	28.67	5.211	12
Week 7	26.57	5.051	12
Week 8	24.58	5.035	12
Week 9	21.67	5.015	12
Week 10	19.17	6.221	12
Week 11	17.42	5.680	12
Week 12	15.58	5.299	12

Discussion

The goal of this study was to test the impact a token reward system would have on reading comprehension scores of a group of twelve participants. Phase A consisted of measuring reading comprehension scores while the token reward system was implemented, and Phase B measured reading comprehension scores once the token reward system was discontinued. After the twelve-week study, this researcher's hypothesis was confirmed that a token reward system had a significant effect on reading comprehension scores during the first six weeks.

This study supported current and previous research surrounding the use of tokens as reinforcers of appropriate behaviors and in increasing academic achievement. Past research has focused on the many different methods of how to teach reading comprehension such as using computer based programs, implementing token rewards contingent on behavior, and the value and relevance of specific tokens. Ihiegbulem, et al. (2011) mentioned that tokens should be motivating for students and that pairing student preferred tokens with a token reward system contingent on academic achievement can lead to success in the classroom.

Results

The results from this study showed there was a significant difference between Week One baseline scores compared to Week Six scores during Phase A. During the second phase, Phase B, the token reward system was discontinued. Results showed that there was a significant difference between the first and last week of Phase B, suggesting that the token reward system did have a positive effect on reading comprehension scores.

Limitations

As a result of this researcher's current teaching position, there were many limitations to this study that would be beneficial to address in future studies. The first limitation was the small sample size. There were only twelve participants and all but one was male. This study's results and the small sample with limited demographic diversity would not be ideal to use across a broad spectrum.

A second limitations were the student inconsistencies which made it difficult to obtain accurate information; from being absent or refusing to attend school to needing police involvement for behaviors. Due to this program being small with only twelve students, any disruptions in the hallways or other rooms proved to be a nuance to the learning environment. There were also consistencies in the number of students transferring in and out of the pogrom during the middle of the study.

A third limitation this researcher had to overcome was the quality of the tokens. The participants had a limit of three tokens to choose from. Ideally, it would have been more interesting to have the participants brainstorm lists of what token they would like to receive on a weekly basis.

The last limitation of this study pertains to the short amount of time this researcher had. Twelve weeks to measure reading comprehension limits the possibilities of finding out any longitudinal results. This researcher believes a yearlong study over the course of thirty-six weeks would have presented more detailed results.

Suggestions for Future Research

This researcher suggests a longer time period for the study, ideally thirty-six weeks, which would be the whole school year. Another suggestion would be to collect data across different content areas. This would open the door for possible research into how students read in Literacy versus Social studies versus Science. Third, having a larger population sample in general education rather than behavior focused special education

would be more beneficial, and would allow other researchers to use the results from this study across a broader range.

In this study, the combined participants' reading comprehension scores were measured and analyzed. For future research, this author would suggest comparing each individual participant's scores against themselves...IE: Each participant would act as their own 'control' group, and the results would focus on individual growth rather than combined growth in reading comprehension.

Implications

Token reward systems have been and continue to be effective at increasing both appropriate classroom behaviors and increasing academic achievement in comprehension. Allowing participants to have input on the specific token rewards might motivate them to give their best effort, and continue to want to improve academically. As educators, we strive to show our students the importance of school and the lifelong impact a good education has on the rest of our lives.

Conclusion

Reading comprehension is an essential skill for lifelong learning. Being able to understand and process what one reads can contribute to intellectual development, including personal and professional success. Academic success in multiple disciplines can also be enabled when reading comprehension skills are mastered. In addition to personal development, our physical and virtual communities are more likely to favorably develop and flourish when a greater number individuals possess a solid foundation in reading comprehension. Those who acquire and demonstrate reading comprehension are likely to assist in passing those skills from one generation to the next. A commitment by educators, and by those who can pass along this crucial skill, will ensure future students are fundamentally equipped to become productive and actively engaged members of the workforce and of our society.

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