Examining how Incremental Shifts in External Regulations Impact Student Performances

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Abstract

Increasing standards in education is frequently discussed on the national level but rarely studied on the local level. English/language arts teachers often use Accelerated Reading™ (AR) as a supplementary assessment tool. Students were required to read novels independently and, upon completion, take the AR multiple-choice test. The results are used to chart students’ performance. During implementation of the research, standards for AR were maintained the first week and then raised incrementally. Results indicated that students increased performance to meet the teacher’s regulation, but only to a point. In the last week, students came to what has been referred to as the “break” point, a point at which they could not meet the required standard. This research is significant for teachers and researchers interested in how students respond when academic standards are increased incrementally.

Key Words: Accelerated Reader; Adolescent Literacy; Assessment; Education Expectations; Motivational Theory; Flow; Self-Determination Theory
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Introduction

Students are motivated to complete assignments for many different reasons. Some students find much of their work to be enjoyable in and of itself, and feel motivated to complete assignments. Still, other students are motivated for a number of reasons. Some students seek praise from their parents or teachers, some want to make a good grade, some feel competitive towards their peers, and some simply want to avoid punishment for lack of achievement.

With increased accountability and assessment, students are annually required to meet certain standards, which at times are raised. This generates questions such as, how do students react to regulations? Will students always strive to meet these regulations? How many students will strive to go beyond the regulations set? This research explores these questions, as it relates to one aspect of students’ English/language arts (hereafter, E/LA) grade. Research on both motivational theories and regulatory assessment tools informed this study. No scholarship has explored the interconnection between teachers’ regulations and students’ performance responses in E/LA.

Accelerated Reader™ and Motivation

Teachers provide assignments and assessments to facilitate students’ learning. Students, however, complete assignments for a variety of reasons. As mentioned, some students seek rewards (i.e. verbal praise, a sense of accomplishment, a good grade, etc.), others avoid punishment (i.e. a low grade, a verbal reprimand, etc.), and still others invest themselves deeply in an assignment because they enjoy it and see it as meaningful and interesting. Previous behaviorist research has contextualized this paradigm to be binary and opposing, based on an
internal or external locus of control, and/or structured around the concept of extrinsic and intrinsic motivation (Deci, Vallerand, Pelletier, & Ryan, 1991; Kowal & Fortier, 1999). The first two reasons center on extrinsic motivation because they are structured around rewards, punishment, and/or punishment avoidance. The final reason—structured on enjoyment and/or perceptions of its relevance—centers on intrinsic motivation.

This paper examines the Accelerated Reading™ (hereafter, AR) program and its resultant impact on students’ motivation. While AR provides tangible extrinsic regulatory measures for assessing students’ reading, these readings are based on students’ choice, which hopefully elicits students’ intrinsic motivation (Deci et al., 1991). To best examine how AR impacts students’ motivation (and learning), this paper will detail the AR program—its purposes and applied methods—and then contextualize it within the paradigm of self-determination, a social psychological theory.

Accelerated Reader

Florida Center for Reading Research (FCRR) defines AR as “a computer based, reading management and motivational system designed to complement existing classroom literacy programs for grades K-12 (Johnson, 2014).” AR uses a Standardized Testing And Reporting (STAR): a multiple choice evaluation designed to assess students’ comprehension and indicates reading level uses a formula based on the book’s length, employed vocabulary, and complexity of sentence structure. These two assessments, of students and books, are intended to reciprocally complement each other to give students a list of books that are well within their reading range (Thompson, Madhuri, & Taylor, 2008). There is much research to support the use of the program in raising tests scores, as well as facilitating students’ motivation to read. The findings,
however, were all conducted by Renaissance Place, the makers of AR. No published research exists to verify the findings and resultant claims.

A study of 2,500 elementary, middle, and high schools noted that schools using the AR program performed better on standardized tests than those that did not (Paul, VanderZee, Rue, & Swanson, 1996). AR consists of a list of over 140,000 quizzes and vocabulary tests for selected novels. Students must pass a quiz, and then are rewarded points based on the length and grade level of the particular novel. Each student participating in the AR program is given some form of assessment to determine their respective reading grade level, and then given a specific range of which to choose books.

AR also seeks to facilitate students’ motivation to read based on a goal and some form of reward system (i.e. cashing in points earned, for prizes). While AR is meant to be an incentive program, with rewards (or regulatory measures) given based on goals met, many schools choose to simply have students earn points toward a goal and do not reward them. There is much literature about such incentive programs, with many researchers opining that an incentive program is actually detrimental to student motivation to read. Krashen, for instance, noted how the reward system in one study actually limited the amount of reading students were willing to do (Krashen, 2003). Many students read what was necessary to earn a reward, while another group of students who were not given a reward read well past their required amount.

In the AR program, students selected books based the AR list and then read them independently. Students should ideally have between 20 and 30 minutes of silent sustained reading (SSR) a day. Krashen noted that students who participated in SSR read more on their own that students who did not, even after such programs ceased to exist (Krashen, 2002). The AR program, initially based in theory on SSR and as a supplement to an existing reading
program, thus emerged in practice as both a substitute reading curriculum and a guide to enable students to find appropriate reading material.

While the above details the purpose and applied methods of AR along with the research literature surrounding AR, teachers assign reading homework and use AR to assess students’ completion of the reading. This is a regulatory paradigm. Students, however, fulfill these assignments for various reasons. Some complete assignments to receive rewards or to avoid punishments. For students in this group, completing the compulsory AR test is the main reason for reading. They are extrinsically motivated based on the external regulatory structure of the class’s assignments and AR’s assessments. Other students are deeply invested and interested in the reading content and would read with or without assigned material or assessment strategies. For students in the latter group, the compulsory AR test is simply a measure proving their reading completion. They are intrinsically motivated. Scholarship documents various contexts and incidents of extrinsic and intrinsic motivation (Deci et al., 1991). Self-Determination theory refines this paradigm to a more appropriate level of complexity (Deci et al., 1991; Kowal & Fortier, 1999). Applied to an educational context, self-determination theory informs—and complicates—teachers’ understandings of students’ motivations for completing assignments.

**Students’ Self-Determination**

According to self-determination theory, people are either intrinsically or extrinsically motivated. Intrinsic motivation is based on a deep interest in an activity simply because of enjoyment in the activity; extrinsic motivation can take many forms and is based on rewards and punishment (Deci et al., 1991; Gagne & Deci, 2005). While teachers use AR and assign all students the same tasks, students do not react in unison. Their reactions are based on multiple
forms of motivation. As previously noted, intrinsic motivation and extrinsic motivation are divergent: extrinsic motivation manifests in many forms while intrinsic motivation does not.

**Intrinsic motivation and flow.**

When a person cherishes an activity, they are intrinsically motivated. People’s “motivation, performance, and development” is maximized most in social contexts that are seen as relevant, at an appropriate level of challenge, and that facilitate their needs for “competence, relatedness, and autonomy (Deci et al., 1991, p. 326-327).” When applied to educational contexts, students’ motivation and understandings are enhanced when they internalize the goals as their own. Students’ internalization, thus, manifests as intrinsic motivation (Deci et al., 1991).

Students learn best when they internalize assignments and are intrinsically motivated. Research indicates that this occurs when students see the assignments as relevant, when the assignments have clear goals and are at an appropriate level of challenge, when students receive explicit and swift feedback, and, most importantly, when students take part in the activity even if there were no rewards and punishment (Csikszentmihalyi & LeFevre, 1989; Kowal & Fortier, 1999). In other words, students learn best and work most diligently when they find the activity meaningful, manageable, and internally rewarding (Csikszentmihalyi & LeFevre, 1989; Kowal & Fortier, 1999). Students experience what has been described as a state of *flow* when they are absorbed in such activities (Csikszentmihalyi & LeFevre, 1989). For illustrative purposes, athletes experience flow and are intrinsically motivated to run when they enjoy the act of running. These athletes would run with or without the regulatory measures of a coach or a game. In short, these intrinsically motivated athletes love running much like intrinsically motivated readers love reading.
AR is an educational assessment—or regulatory measure—based on assigned reading that provides opportunities for students’ internalization and flow. However, as previously mentioned, students do not react in unison to the same regulatory measure (Deci et al., 1991). For intrinsically motivated students, AR is simply a final assessment for an activity that they would do on their own. They accept the resultant rewards but do not base their behaviors on expected rewards. The rewards and punishments are external regulations that have little impact on their behaviors (Csikszentmikalyi & Lefervre, 1989). Most students’ behaviors, however, are impacted by such regulatory measures as rewards and punishments.

**Extrinsic motivation.**

As an educational assessment, AR provides opportunities for students’ intrinsic motivation, internalization, and flow. AR is also a regulatory measure based on rewards and punishment. If students are not intrinsically motivated, then behaviors are characterized as based on extrinsic motivation (Deci et al., 1991). In other words, extrinsic motivation manifests whenever intrinsic motivation is absent. Students’ extrinsic motivation can manifest in four forms: external regulation, introjected regulation, identified regulation, and integrated regulation. They are best understood when considered as located on a continuum of self-determination.

External regulation represents the far left section of the continuum of self-determination. Students are externally regulated when they only seek to receive rewards or avoid punishments (Deci et al., 1991, p. 329). If students only read and take the AR test to receive a high grade (or praise) or to avoid a low grade (or verbal reprimand), then they are externally regulated. For comparative purposes, this is akin to an athlete running sprints at the end of practice because if s/he does then the coach will provide praise or, if s/he does not run, the coach will castigate.
This athlete does not want to run, but does so only to comply with the coach’s external regulations; this is similar to a student who reads only to receive a reward or avoid punishment. External regulation, seen as the far left end of the continuum of self-determination, represents the least self-determined form of extrinsic motivation because the person would not conform without the external regulations.

Introjected regulation, a form of extrinsic motivation, is left-center on the continuum of self-determination (Gagne & Deci, 2005). Introjectedly regulated students “take in but do not accept” the assignments’ requirements (Deci et al., 1991, p. 329). In other words, such students internalize the rewards and punishments, but do not internalize (or identify with) the reading. To extend the sports analogy, this is similar to an athlete wanting to run sprints only because s/he wants to play in the game. The athlete, like the reader, internalizes the goal (the reward) but does not identify with the means to attain the goal (or reward).

Identified regulation, a form of extrinsic motivation, is right-center on the continuum of self-determination (Gagne & Deci, 2005). Students who value the behavior and identify with (and accept) the rewards and punishments demonstrate identified regulation (Deci et al., 1991). To build on the previous analogy, this is akin to an athlete wanting to run sprints because she sees the benefits as directly related to success in competition. She may not love to run sprints, but she loves to win. This is akin to a dedicated student who values good grades and sees the benefits in reading, even if she does not necessarily love the reading content. The athlete, like the reader, performs the task because of its usefulness towards goal attainment; it is relatively self-determined because it is done willingly (Deci et al., 1991).

Integrated regulation, a third form of extrinsic motivation, is far right on the continuum of self-determination (Gagne & Deci, 2005). The reader (or the athlete) identifies with the goal (or
reward), the means to attain the goal (or reward), and finds pleasure in both. As previously
articulated, “the regulatory process if fully integrated with the individual’s coherent sense of
self… [and it resembles] intrinsic motivation because both are forms of autonomous self-
regulation (Deci et al., 1991, p. 330).” Deci et al. (1991) and Gagne and Deci (2005) see
nuanced differences between integrated regulation and intrinsic motivation. They distinguish
intrinsic motivation as a reader’s (or athlete’s) interest in the activity as independent from any
and all rewards and punishments; a reader (or athlete) who displays integrated regulation
appreciates the activity as it relates to the end goal.

As mentioned, students’ responses to teachers’ regulatory measures vary greatly between
the binary concepts of intrinsic motivation and extrinsic motivation. Extrinsically motivated
students’ actions can be contextualized on a continuum of self-determination. As previously
mentioned, research indicates students learn best when they are intrinsically motivated and
experience flow (Csikszentmikalyi & Lefervre, 1989; Kowal & Fortier, 1999) or when their
motivation lies on the right-center or far right of the continuum of self-determination (Deci et al.,
1991; Gagne & Deci, 2005). These understandings should inform how educators view and
utilize AR.

**Conclusion Drawn from the Research**

Because AR is an external regulatory measure, many believe it provides students’ much-
needed rewards. Research indicates, however, such regulatory measures could negatively impact
students’ self-determination. The purpose of AR is to get children reading, with the hope that by
initially motivating them through external means, they will learn to love to read and find the
intrinsic value of the activity. This does not cohere with the research on students’ motivation
when set within the context of teachers’ regulatory measures because the teacher cannot control
students’ reactions to such external regulations. The teachers’ use of AR provides two measurable tools, each of which may positively impact students’ self-determination.

First, as a tool for assessment, AR is efficient, as judged by time expediency, and effective, as indicated by usefulness. AR also provides students with explicit and swift feedback. Taken cumulatively, AR has the potential to positively impact students’ efforts (Csikszentmihalyi & Lefervre, 1989; Kowal & Fortier, 1999).

Second, as a tool for guiding students’ book selections, AR provides options that are at an appropriate level of challenge. Due to AR’s ability to cross-reference, such guidance offers students relevant and readable options about which even the teacher may not be aware. Such characteristics also have the potential to positively influence students’ efforts (Csikszentmihalyi & Lefervre, 1989; Kowal & Fortier, 1999).

Like a coach and his whistle, AR provides external regulations that may force students to act, but it alone cannot compel students to internalize the coach’s goals or identify with the coach’s methods. Proper book selection can elicit students’ authentic interest in reading and, hopefully, facilitate students’ intrinsic motivation in ways similar to how timely and effective feedback can foster students’ identified or integrated regulation. As an assessment tool and as a guide for book selection, AR provides teachers much support. As a reading curriculum, AR falls short.

**Purpose**

The purpose of this study was to examine the following research questions:

1. Measured students’ responses to base external regulations
   a. How many met or exceeded the standards set?
   b. How many did not meet the standard set?

2. Measured students’ responses after external regulations are changed
a. How many met or exceeded the standard set?  
b. How many did not meet the standard set?

The district measured students’ completion of reading assignments is based on successful completion of AR tests. These were increased incrementally as students advanced by grade and matured during a given school year. Stated differently, the point values needed for successful completion of this task were raised as students progressed.

Methods

This section details the employed methodology. Each aspect is explored thoroughly within the subsequent subsections.

Participants

The sample was comprised of 74 sixth grade students from a rural middle level Midwestern school, all of whom were in the teacher-researcher’s E/LA classes. Prior to the beginning of the school year and throughout the entire research process, forty six students were placed in two advanced E/LA classes. These are denoted as class A and class B. To gain entry into these classes, students must have met or exceeded 6th grade E/LA standards on standardized tests administered by the state and the school district while they were in 5th grade. Students in these two classes were predominately white, middle class, with approximately 11% on free or reduced lunch and no reading or behavior disability. Twenty eight other students (signified as class C) were placed in the teacher’s other E/LA classroom; they did not meet or exceed the 6th grade E/LA standards on standardized tests while in 5th grade. The students in this class were predominately white, middle class, with approximately 42% on free or reduced lunch and approximately 20% having a reading or behavior disability.
Instruments and Curricular Content

Weekly reports from AR were used to chart students’ performance. The teacher-researcher could see the AR data on individual students or on whole classes. AR uses a formula based on word length and sentence structure, as well as length of a novel to assign a set number of points for a book, as well as a suitable grade level for the intended reader. The more challenging a book is to read, the higher the reading level and amount of points the book is worth. Renaissance Place, the makers of AR, made available thousands of tests for popular novels, as well as a test generator available for the teacher to make a test for newer novels. Students were allowed and encouraged to select any book that interested them. To facilitate their motivation, the teacher-researcher offered guidance but did not prescribe any titles or genre.

Procedures

Students were required, as a regulatory measure, to attain a certain amount of AR points each week. They were then required to read novels on their own and complete the Accelerated Reader competency test upon completion of the novel. Weekly points the students acquired were printed off on a spreadsheet. All data was collected at the school. Students were given a number and all names were removed from any progress reports used to assure anonymity. The information was not accessible to the public and names did not appear in this project. All data including identifiers were kept under a password and accessible only to the researcher and the media specialist at the school.

Prior to this study and as previously mentioned, students were ability grouped within their E/LA class. Classes A and B represent high achieving students; class C represents lower achieving students. During the four week study, data was collected through weekly reports.
illustrating the points earned by students. The reports were generated by the AR program and used as regulatory measures.

The researcher measured a base line of students’ AR scores during the 2nd quarter of the school year. This was a compilation of nine weeks worth of points. Students were required to read 16 AR points for the 2nd quarter, which was equivalent to 1.77 points a week. Weekly external requirements were then raised. Raised weekly requirements served as the external regulation for this study. The researcher then assessed students’ AR scores after increasing external regulatory measures (read: raised points required). AR scores were then examined to see how scores changed between the baseline and the raised weekly points.

Data Analysis and Results

Every quarter during the school year, the required amount of AR points needed for a grade were raised. As stated previously, the second quarter served as a baseline. During this quarter, students were required to earn 16 points, which was equivalent to 1.77 points per week. During this quarter, 87% (20 students per class) met this requirement in classes A and B, while 13% (3 students per class) did not. In class C, 64% (18 students) met the requirement, while 36% (10 students) did not. The following data (represented in Table 1) signifies the number of students per class who met the regulatory measure (seen in blue) and those who did not (shown in red).
As the above table reports, the vast majority of students in all three classes met the regulatory measure. While a significantly higher percentage of students in class C did not meet the regulatory, the majority did. It is noteworthy that a pattern was established by this baseline: a majority of students met the regulatory measure.

During the first week of changing regulatory measures, students were required to earn at least one AR point. This actually lowered the standard set for the school year. In class A, 40% (9 students) met or exceeded the standard set, while 60% (14 students) fell below. Class B only had 30% (7 students) meet the standard, with 70% (16 students) falling below. Class C only had 21% (6 students) students earn a point or more, while 79% (22 students) did not. These data are represented in Table 2 below.
Week two (seen in Table 3) found students striving to read and test on a novel worth at least two points. Class A had a slight drop in performance, with only 35% (8 students) students earning the required points, and 65% (15 students) falling below the benchmark. Class B showed improvement with 57% (13 students) meeting the standard, and only 43% (10 students) falling below the standard. Class C also made gains with 36% (10 students) meeting their goal, and 64% (18 students) falling below.
During week three (represented in Table 4), the number of students who reached the goal increased dramatically. This week, students were required to have read a book worth at least three points. In class A, nearly 96% (22 students) met or exceeded the goal set, while only 4% (1 student) fell below. Class B showed a rise with 87% (20 students) meeting or exceeding their goal and only 13% (3 students) failing to do so. Class C also saw a dramatic rise with 82% (23 students) meeting or exceeding their goal and 18% (5 students) not.
Week four, however, saw a fairly dramatic decrease in student performance, which is signified within table five. Class A showed a decline with 57% (13 students) meeting the standard, and 43% (10 students) failing to do so. Class B, had just the opposite with 43% (10 students) meting and 57% (13 students) falling below. Class C also decreased with 18% (5 students) meeting or exceeding the standard and 82% (23 students) falling short.
During the baseline 2\textsuperscript{nd} quarter, students were required to read an average of 1.77 points per week. Students were never told this was the amount of points they needed weekly; they only knew they needed to earn 16 points within the nine week marking period. During the first week of the changing regulatory measures, requirements were actually lowered by almost an entire point. Students were not aware of the weekly breakdown of points, so they did not understand that standards had been lowered. Then, standards were raised weekly, with an expectation the final week (4 points) more than twice the amount they were initially required. The data below, seen in Table 6, shows the increase of external regulations regarding the point system.

<table>
<thead>
<tr>
<th>Week</th>
<th>Required AR Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (%)</td>
<td>1.77</td>
</tr>
<tr>
<td>Week 1</td>
<td>1.67</td>
</tr>
<tr>
<td>Week 2</td>
<td>2.00</td>
</tr>
<tr>
<td>Week 3</td>
<td>3.00</td>
</tr>
<tr>
<td>Week 4</td>
<td>4.00</td>
</tr>
</tbody>
</table>

*Note: Baseline determined by 16 points per 9 weeks (1.77 per week)*
The above table details the external regulatory measure (set by the teacher) that students were required to meet. As mentioned previously, students react differently to changing regulatory measures.

The results show students reading levels dropped to meet the standard set by the teacher in week one and then gradually climbing to meet the standard set weekly. Class A had a slower start, actually falling in week two before climbing back up in week three. Classes B and C both showed a gradual climb, with a higher number of students meeting or exceeding the goal set as the weeks progressed. By week four, the external regulation was almost twice the amount the students were used to. This was a very ambitious amount of points to require, as this would move the requirement from 16 points a quarter to 36 points, more than doubling the amount of outside reading the student would be required to undertake. Students had a very hard time meeting this requirement and the students meeting and exceeding drastically dropped. Table 7 reports classes A, B, and C weekly progress.
These results suggest important implications for teachers. In short, external regulatory measures impacted students’ reading levels. The subsequent section explores this data-based finding more thoroughly.

**Findings, Action Plan, and Limitations**

Whereas intrinsically motivated students internalize and garner pleasure from the activity, extrinsically motivated students—wherever they are on the previously detailed continuum—respond to the external regulatory measure. While Deci et al. would argue that this study cannot determine students’ motivation with any certainty (Deci et al., 1991), it can assess how students responded to the external regulatory measure.

**Findings**

The above data and observations have consequential implications for educators. The data indicate that students adapted to changing external regulations. This pattern, when applied to motivation theory, indicated that students accommodated their behaviors to teacher-set regulations. Stated simply, students lowered their reading output when the standards decreased and increased their reading output when the standards increased, but only to a certain level. During week four, students met what researchers have termed the “break” point (Kowal & Fortier, 1999). This point of resistance (or an inability to adapt to external regulatory measures) can clearly be seen in Table 8.
Data in Table 8 indicated that students adapted their behaviors to cohere with external regulations. As external regulations decreased (unbeknownst to the students), students’ reading output decreased. As external regulations increased, students’ reading output increased. The key to this data, noted in week four, appears to be what has been described as the “break” point (Kowal & Fortier, 1999). Stated succinctly, students could not meet the demands requested.

To apply this pattern to previously reviewed research, the external regulatory measure of AR eliminated the possibility of intrinsic motivation in students (Deci et al, 1991). While some research suggests students’ performances on AR positively influenced standardized test scores (Paul et al., 1996), other research indicated a negative correlation between motivation and reward (Krashen, 2003). The latter finding coheres with self-determination theory (Deci et al., 1991; Gagne & Deci, 2005; Kowal & Fortier, 1999), which seeks to explain why students react differently to the same external regulation.

Since students’ preoccupation with adapting to the reward system inhibits flow and since they were required to engage in the activity, their responses can be described as being on some position within the continuum of extrinsic motivation (Csikszentmihalyi & Lefervre, 1989). While it is beyond the scope of the research to determine which form of extrinsic motivation,
research findings suggest varying levels introjected, identified, or integrated regulation (Deci et al., 1991).

**Limitations**

The AR program is a limitation within itself. AR tests are simply multiple choice comprehension tests and do not require any higher order of thinking skills. This is a problem when used as a sole tool to define if a student understood and finished a novel as students are simply asked to pick a right answer out a choice of wrong ones. Multiple choice tests which are computerized are also easier for students to find loop holes in the system, thus cheating can become an issue. To protect from this, students must have a teacher’s permission and the book they wish to test present. Students must also take all tests at school and only on certain computers. This drastically cuts down on students logging in under another student’s name and taking a test for them. While it is very probable that cheating still occurs, proactive steps have been taken in an attempt to maintain intellectual integrity of the tests. Also, by requiring students to read at home, the researcher is assuming that all students have a safe, quiet place outside of school in which to read their novels. This is not always the case for students in this socio-economic context.
References


