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Second Year Analysis of a Hybrid Schedule High School

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Abstract

The current study examined two independent sophomore cohorts from a mid-western high school that had implemented a multi-schedule system (i.e., traditional, block, hybrid). The purpose of the study was to examine differences among the schedule types, gender, and GPA group on a state mandated standardized test. Analysis of covariance was used to examine the differences. Results indicate that a significant difference among schedule types was observed for only one cohort and for only one test (mathematics-computation). Results also indicate that schedule type did not significantly interact with gender or GPA group. The authors conclude that for these cohorts the type of schedule does not negatively or positively influence achievement.

The reorganization of class scheduling is one current trend in education designed to increase student achievement. One particular reform, called block scheduling, has drawn a great deal of attention over the past decade (Canady & Rettig, 1995). Specifically, questions have been raised concerning the effects of block scheduling on student performance. Survey research has reported that many teachers, students, and parents support the block reform initiative, but survey data only offer evidence regarding the perceived impact of block scheduling. Lacking in the educational research journals are studies that directly compare the effects of schedule types on student achievement. In addition, previous studies have not systematically investigated which students benefit from the implementation of block scheduling. Responding to these relatively neglected areas, this study uses state mandated achievement tests in specific subject areas to examine the overall effects of schedule type and potentially differential effects by gender and grade point average.

Literature Review

The move to block scheduling has found its way into all types of high schools and some middle schools in the United States and Canada (Canady & Rettig, 1995; Cobb, Abate, & Baker, 1999). For this reason, educators, administrators, teachers, and parents have vigorously argued the merits and pitfalls of block scheduling. Supporting evidence on both sides is often drawn from surveys (Salvaterra, Lare, Gnall, & Adams, 1999; Sessoms, 1995; Tanner, 1996; Veal & Flinders, 1999) or from trend data (Buckman, King, & Ryan, 1995; Edwards, 1993; Holmberg, 1996; Schoenstein, 1995). However, there have been only a handful of comparative studies (Bateson, 1990; Cobb, Abate, & Baker, 1999; Hess, Wronkovich & Robinson, 1998; Veal & Schreiber, 1999), and some of these studies have focused on the outcomes of standardized tests (see also, Lockwood, 1985; Wild, 1998). As with survey and trend observations, results of comparison studies sometimes report benefits for block scheduling, sometimes report no difference, and sometimes report lower achievement than found in traditional scheduling.

Only a handful of studies have examined the effects of block scheduling on academic achievement by gender, again with inconclusive results (Cobb, Abate, & Baker, 1999; Lockwood, 1995). Outside the literature on block scheduling, however, gender differences in achievement are one of the most hotly debated topics in education. In mathematics, for example, Freidman (1989) conducted a meta-analysis of 98 studies, concluding that there was little evidence of gender difference in achievement for students up to the age of ten (e.g., Callahan & Clements, 1984; Dossey, Mullis, Lindquist, & Chamber, 1988). If differences were found at this level, the differences favored females (e.g., Hawn, Elliot, & Des Jardines, 1981; Potter & Levy, 1968). At the middle school level, Friedman found widely mixed results. Some results favored females (Tsai & Walber, 1979), others favored males (Hilton & Berglund, 1974), and some were conflicting (Circicelli, 1967; Fennema & Sherman, 1978). At the high school level, Friedman examined seven studies on mathematics achievement and gender. Five of the seven studies reported males outperforming females with the remaining two studies showing no difference. A host of theories have been offered to explain this trend across grade levels, most of which focus on societal factors and/or school practices (e.g., Brophy & Good, 1974; Fennema & Sherman, 1977; Leder, 1986; Linn & Peterson, 1986; Lee & Bryk, 1986).

In the areas of reading and language, studies of gender and achievement across grade levels suggest a different pattern. Thorndike (1973) analyzed international reading achievement data, finding that high school female achievement was slightly higher than achievement for males but not strong enough to be conclusive. Other studies suggest that males' reading and verbal skills were lower throughout and after high school (Backman, 1972; Droege, 1967; Mondary, Hout, & Luntz, 1967; Rosenberg & Sutton-Smith, 1969; Very, 1967). Hogrebe, Nist, and Newman (1985) using the High School and Beyond data observed that by the time students reach high school, the magnitude of reading achievement differences between males and females is small and accounts for less than one percent of the variation in scores. More recently, differences favoring female students in the areas of spelling, (Stanley, Benbow, Brody, Dauber, and Lupkowski, 1992), reading comprehension (Hedges and Newell, 1995), and writing (U.S. Department of Education, 1997) have been observed.

Purpose

The main purpose of the following study is to compare student achievement on state mandated achievement tests at a unique high school currently using three different schedule types (traditional, block, hybrid). In particular, the data and analyses focus on how scheduling differentially influence achievement in the areas reviewed above: mathematics, reading, and language. An important element in the design of this study was the building of a replication. Two different groups of similar sophomore students took the same achievement test in consecutive years. Specific research questions are:

1. Is student achievement in the three subject areas influenced by the type of schedule?
2. Is student achievement in the three subject areas related to gender?
3. Is student achievement in the three subject areas influenced by GPA?
4. Is there an interaction between gender and schedule type in the three subject areas?
5. Is there an interaction between GPA and schedule type in the three subject areas?
6. Are the results observed on research questions 1-5 consistent across cohorts?

Methods

This study was conducted at a large, four-year high school located in a medium-sized city in Indiana. The student population consists of approximately 1800 is mostly white children from the town and rural areas of the county. In the fall of 1997, the school began a tri-schedule format running at the same time during the school day. The tri-schedule format includes three schedule types: 4 X 4 block, traditional schedule, and hybrid. The 4 X 4 block schedule consists of four, 87-minute daily classes taught for one semester. The traditional schedule consists of six, 55-minute daily classes that meet for the entire school year. The hybrid schedule consists of three traditional and two block classes each day.

Under this format, both traditional and block courses were offered in all subject areas except the performing arts and Advance Placement classes. The total contact time in a block course is approximately 2,000 minutes less than for a year-long traditional course, or 37 fewer class meetings (see Table 1). This reduced contact time per course allows block students to complete up to eight rather than six courses per year.

Table 1
Descriptive information for classes under block and traditional schedules

Schedule Descriptors	Traditional	Hybrid	4X4 Block
Class Time (mins./day)	55	55 and 87	87
Number of Days of Instruction	180	180 and 90	90
Class Time (mins./school year)	9900	9900 and 7830	7830
Classes/Day	6	5	4
Classes/Year	6	7	8
Hours/Day	6.5	6.5	6.5
Credits	12	14	16

State Mandated Test of Basic Skills

The Indiana Statewide Testing for Educational Progress (ISTEP+) is a state mandated test of basic skills and academic aptitude that is administered to all students in Grades 3, 6, 8, and 10 (Sophomores). The academic subject areas tested are reading, language, and mathematics. The sub-areas of reading are *comprehension* and *vocabulary*. The sub-areas of language are *mechanics* and *expression*. The sub-areas of mathematics are *concepts and applications*, and *computation*. In addition to these sub-areas, each area has a total score, which is the composite of the two sub-areas, and a battery score that is a composite of the six sub-areas. For the purposes of this study, Normal Curve Equivalent (NCE) scores and the Cognitive Skills Index (CSI) were used. The NCE and CSI scores are norm-referenced. The NCE scores are based on an equal-interval scale (1-99). Using NCE scores permits comparisons among schedule groups. The CSI describes an individual's overall performance on the aptitude questions of the ISTEP+. This score compares the student's cognitive ability with that of students who are the same age. The CSI is a normalized standard score with a mean of 100 and a standard deviation of 16.

Sample

All sophomores are required to take the three sections of the ISTEP+ in September. The test is administered to the sophomores over a four-day period for three hours per day. If a student did not reside in the state of Indiana the year before or attended a different school in Indiana, the student is still required to complete the test. Due to absences, some students did not take certain portions of the test. Transfer and absent students were not included in the analyses. The sample for this study consists of two cohorts; students who were sophomores in 1997 and 1998. The first sophomore cohort has 332 students and took the ISTEP+ in September 1997. The second sophomore cohort has 318 students and took the ISTEP+ in the September 1998. These two cohorts are independent.

Analysis

All ISTEP+ dependent variables (i.e., test scores) were analyzed using a three factor fixed effect analysis of covariance (ANCOVA), with schedule type, gender, and GPA-group as the independent variables, and CSI as the covariate. Analysis of covariance was used because students were not randomly assigned to schedule types; i.e., there is reaaason to believe that students cognitive aptitude varied systematically as a function of their schedule type (Table 2). The dependent variables were the test scores for each sub-area of the standardized test. For each cohort students' cumulative freshman GPAs were divided into four categories (quartiles) based on boxplots of the grade point averages. The first category, "Low," includes those students whose GPAs range from 0.00 to 2.24. The second category, "Middle," consists of students whose GPAs range from 2.25 to 2.99. The next category, "Mid-High," includes students whose GPAs range from 3.00 to 3.59. The final category, "high," includes students whose GPAs range from 3.60 to 4.00.

Table 2
Cognitive Skills Index for Schedule Type

Schedule Type	CSI (1997)	CSI (1998)
Traditional	113.06	109.63
Block	113.11	110.68
Hybrid	116.99	116.03

Table 3
Significant Main and Interaction Effects From Cohort 1 and Cohort 2

	Cohort 1						**Cohort 2**					
	RDGC	RDGV	LANE	LANM	MAT CA	MAT C	RDGC	RDGV	LAN E	LAN M	MAT CA	MATC
Gender		**X**		**X**	**X**	**X**		**X**	**X**	**X**	**X**	**X**
Schedule						**X**						
GPA Group	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Gender * Schedule												

Gender * GPA Group							**X**	**X**	**X**			
Schedule * GPA Group												
Gender * Schedule * GPA Group								**X**				

X indicates significant at the .05 level
RDGC = reading comprehension RDGV = reading vocabulary
LAN E = language expression LAN M = language mechanics
MAT CA = mathematics concepts and applications
MAT C = mathematics computation

Results

Due to the nature that the sample populations were different, the results are separated into two cohorts to show the replication of the study. This allowed for the results to be analyzed in an attempt to see if the differences or gains were consistent over two years. The results and mean differences of the cohorts on each section of the ISTEP+ are found in Tables 4, 5, 6, and 7. All significant values are reported as $p < 0.05$.

Cohort 1: 1997 Sophomores

Reading

In the reading-*vocabulary* sub-area, males scored significantly higher than females. The difference between the average test scores was 5.702. No other main effects or interactions were significant, i.e., GPA and schedule type. In reading-*comprehension* significant differences were found only for GPA group. High, mid-high, and middle GPA groups all scored significantly better than the low GPA group. No significant interactions were observed.

Table 4
Gender Differences in Test Scores

Cohort 1	Reading Vocabulary		Language Mechanics		Language Expression		Math Computation		Math Concepts & Application	
Gender	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error

Male	68.2	1.5	60.4	1.4	63.9	1.2	67.1	1.1	69.7	1.2
Female	62.5	1.4	67.7	1.3	66.1	1.2	63.3	1.0	66.1	1.1
Cohort 2										
Gender	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error
Male	66.0	1.4	61.0	1.1	66.3	1.0	66.9	1.0	72.0	1.0
Female	60.1	2.0	67.3	1.6	72.1	1.5	62.0	1.4	65.9	1.5

Table 5
GPA Group Differences

Cohort 1	Reading Comprehension		Reading Vocabulary		Language Mechanics		Language Expression		Math Computation		Math Concepts & Application	
GPA Group	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error
High	72.710	1.482	67.726	1.742	72.387	2.413	72.366	1.489	73.478	1.988	78.336	1.405
Mid-High	70.971	1.401	66.562	1.647	65.550	2.066	65.004	1.407	67.302	1.702	69.119	1.335
Middle	70.155	1.878	64.960	2.207	63.823	1.549	65.241	1.886	62.750	1.277	62.997	1.781
Low	59.315	2.192	62.332	2.577	54.431	1.630	57.380	2.203	57.152	1.344	61.168	2.080
Cohort 2												
GPA Group	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error
High	73.494	2.030	70.421	2.206	73.261	1.956	78.360	1.804	72.547	1.724	79.537	1.626
Mid-High	66.464	2.603	59.961	3.034	64.956	2.509	69.758	2.314	65.377	2.211	70.630	1.655
Middle	66.054	1.933	64.347	2.253	64.377	1.864	71.107	1.719	63.061	1.643	66.555	2.227
Low	58.330	1.893	70.421	2.206	53.978	1.832	57.628	1.690	56.932	1.615	59.232	1.736

Language

For the language-*mechanics* sub-area, females scored significantly higher than males with an average difference of 7.28. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 6.837, 8.564, and 17.956 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 11.119 and Middle GPA students scored significantly higher than Low GPA students with a average difference of 9.393. No significant interactions were observed.

Only GPA differences were significant on the language-*expression* sub-area. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 7.362, 7.125, and 1.985 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 7.623 and Middle GPA students scored significantly higher than Low GPA students with an average difference of 7.860. No significant interactions were observed.

Mathematics

Males scored significantly higher on mathematics-*computation* than females. The average difference was 3.811. The traditional schedule students scored significantly higher than block and hybrid schedule students. High GPA students scored significantly higher than Mid-High, Middle, and Low GPA students, with average differences of 6.176, 10.728, and 16.326 respectively. Mid-High GPA students scored significantly higher than Middle and Low GPA students with average differences of 4.552 and 10.150 respectively. Middle GPA students scored significantly higher than Low GPA students did with an average difference of 5.598. No significant interactions were observed.

Table 6
Mathematics Computation for Schedule Type

	Adjusted Mean	Std. Error
Schedule Type		
Traditional	68.119	1.117
Block	64.401	1.144
Hybrid	63.806	1.650

For mathematics-*concepts and applications*, males scored significantly higher than females with an average difference of 3.518. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 9.217, 15.359, and 17.168 respectively. Mid-High GPA students scored significantly higher than Middle and Low GPA students with average differences of 6.142 and 7.952 respectively. No significant interactions were observed.

Cohort 2: 1998 Sophomores

Reading

For reading-*vocabulary*, males scored significantly higher than females. The difference between the average test scores was 5.898. High GPA students scored significantly better than Mid-High and Low GPA students, with average differences of 10.460 and 12.845 respectively. Middle GPA students scored significantly higher than Low GPA students with an average difference of 6.771. Significant interactions were observed for gender by GPA group ($F(3,293) = 4.505$ $p < .05$) and schedule type by gender by GPA group ($F(6,293) = 3.421$ $p < .05$). The plots of the interactions showed disordinal pattens indicatingvarying achievement levels as schedule type, gender, and GPA group changed.

On the reading-*comprehension* portion of the test, significant differences were found only for GPA Group. High GPA students scored significantly better than Mid-High, and Low GPA students, with average differences of 7.030, 7.440, and 15.164 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 8.134. Middle GPA students scored significantly higher Low GPA students with an average difference of 7.724. One significant interaction was observed--that for gender by GPA group $F(3,317) = 3.875$, $p = .01$. Figure 1 provides a graphic display of the interaction. The interaction indicates that females perform better than males until they reach the Mid-High GPA level. The performance by Low and Middle GPA students is comparable with female scores above those of males. Yet, the performance for females in the Mid-High GPA group decreases dramatically compared to males. The scores then rebound to comparable levels and are slightly below those of males in the High GPA group.

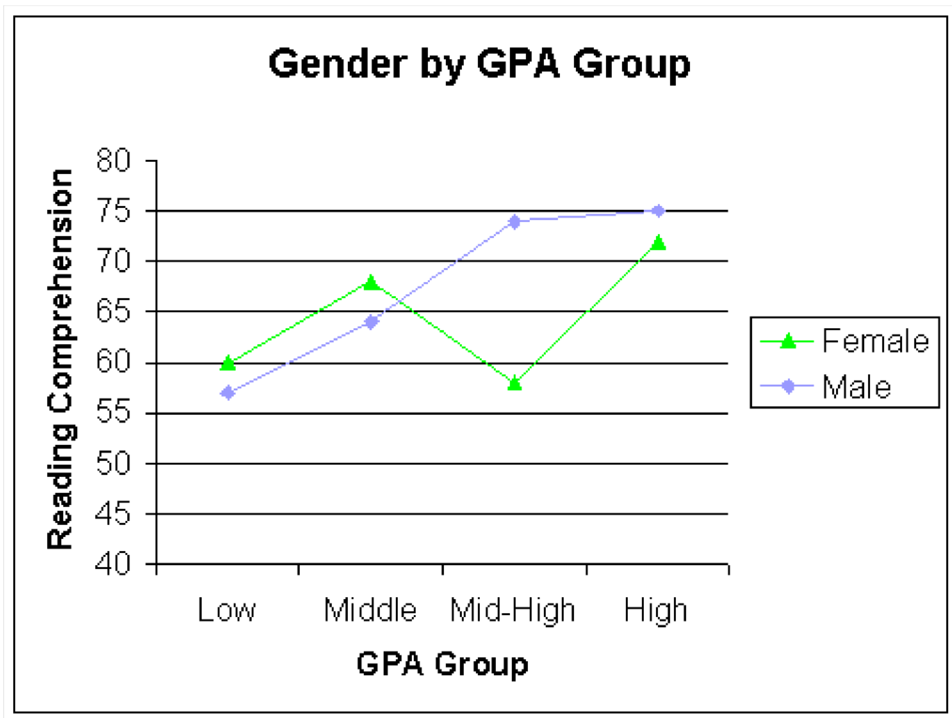

Figure 1. Reading Comprehension Gender by GPA Group for Cohort 2

Language

For the language-*mechanics* sub-area, females scored significantly higher than males with an average difference of 6.346. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 8.305, 8.884, and 19.283 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 10.987, and Middle GPA students scored significantly higher than Low GPA students with an average difference of 10.399. No significant interactions were observed.

For the language-*expression* sub-area, females scored significantly higher than males with an average difference of 5.849. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of

8.602, 7.253, and 20.733 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 12.131, and Middle GPA students scored significantly higher than Low GPA students with a average difference of 13.480. One significant interaction was observed for gender by GPA group. Figure 2 provides a graphic display of the interaction, which reveals that males in the Low and Middle GPA groups perform at a lower level than females. The difference in ability is negated with students in the Mid-High and High GPA groups. Females in the Mid-High GPA group perform worse, and subsequently match those of the male Mid-High GPA group.

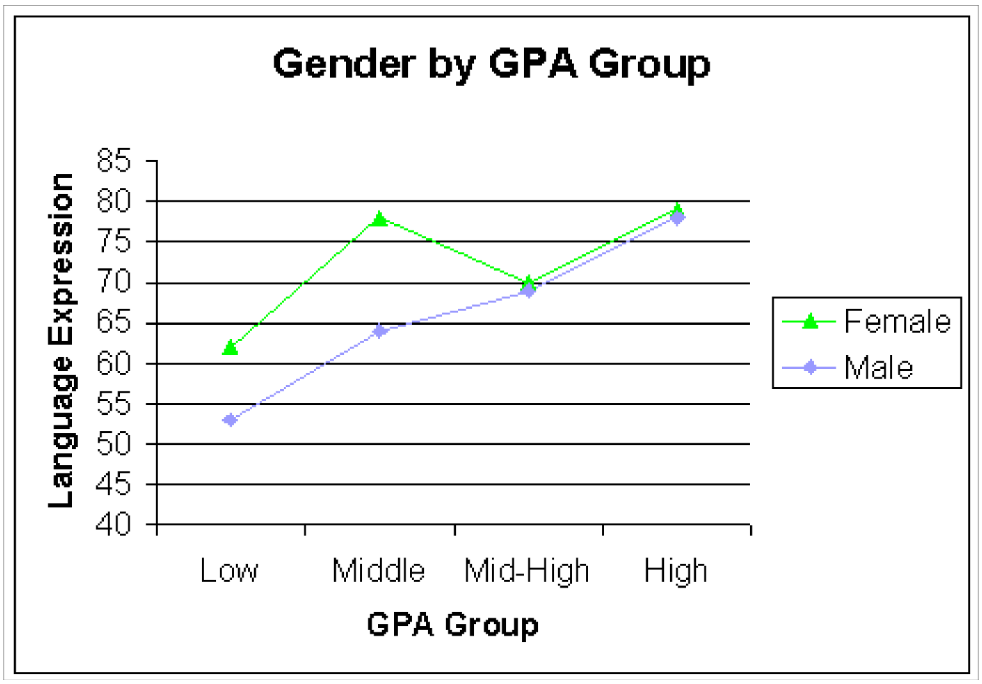

Figure 2. Language Expression Gender by GPA Group for Cohort 2

Mathematics

Males scored significantly higher on mathematics-*computation* than females. The average difference was 4.882. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 7.170, 9.486, and 15.615 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 8.445. Middle GPA students scored significantly higher than Low GPA students with an average difference of 6.129. No significant interactions were observed.

For mathematics-*concepts and applications*, males scored significantly higher than females with an average difference of 6.100. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 8.907, 12.982, and 20.304 respectively. Mid-High GPA students scored significantly higher than Low GPA students with average differences of 11.398. Middle GPA students scored significantly higher than Low GPA students with average differences of 11.398. No significant interactions were observed.

Discussion

The discussion is organized by research question and focuses on areas related to the covariate used in the analysis. These covariates were chosen because they were accessible in the database, and they answered salient practical questions that have not been answered in the literature about block scheduling effects on ability level students and gender.

Block scheduling had essentially no positive impact on academic achievement as measured on the ISTEP+. Only one cohort (1997 sophomores) showed better performance across various schedule formats and only on one of the six sub-tests across the ISTEP+ (math-*computation*). Surprisingly, this single difference favored the traditional schedule group.

Schedule Type

Only mathematics-*computation* for Cohort 1 had a significant difference in achievement among schedule types. It is possible that the difference can be attributed to the overall amount of time and the daily class meetings for an entire year. Recall that the block schedule had the equivalent of 37 fewer class meetings. However, the difference was only observed with one of the six tests, and the observed difference was not replicated with the second cohort. The replication failure is particularly noteworthy in that the teachers for the second cohort had another year of the scheduling experience behind them allowing them to become familiar with the block system and make instructional adjustments. Thus, taken as a whole, these findings leave open the possibility that the single statistical signpost result may be an anomaly. Overall, schedule type does not appear to improve or decrease student achievement.

Gender

For Cohort 1, males outperformed females on mathematics-*computation*, mathematics-*concepts and applications*, and reading-*vocabulary*. Females outperformed males on language-*mechanics*. No gender differences were found on reading-*comprehension* and language-*expression*. For Cohort 2 the same differences were observed on reading-*vocabulary* with male students outperforming female students. The vocabulary result was unexpected and originally it was thought the first difference may have been an artifact of the cohort because males have been observed to perform lower than females in reading achievement (e.g., Backman, 1972). The replication seems to indicate that this observation may be more consistent than previously thought and warrants further investigation. The observations for mathematics-*computation* and *concepts and applications* tests are consistent with earlier research on gender inequities at the high school level (e.g., Friedman, 1989). Evidence for the pattern of males outperforming females is disappointing in recent studies such as our own. It suggests that after decades of research, the problem of gender disparity has yet to be solved. Overall, excluding the vocabulary observation, the results are consistent with previous gender difference observations.

GPA

Due to the purposeful categorization of the four GPA groups, the significant differences found in this area are not surprising. It was expected that the highest GPA group would perform significantly better than the other GPA groups. One interesting aspect of the GPA groups was the complete lack of a difference for reading-*vocabulary* for cohort one. A second interesting aspect was the lack of significant difference was between the Middle GPA and Mid-High GPA students in a few cases and across cohorts (e.g., language-*expression*). One could speculate that the involvement in extracurricular activities may influence how the students in the category performed. Those who may need extra time to study may not be getting it at these GPA groups if they are involved in extracurricular activities.

Gender and Schedule Type

The observations indicate that for both cohorts schedule type does not interact with gender and cause differential performance on the tests. This appears to indicate that schedule type does not hinder or assist one gender over the other, though future studies may or may not support this finding. This finding is important if it is to inform policy. Schedule type has not been reported as a factor influencing gender achievement. Decisions whether to adopt block scheduling should not be made based upon perceived performance by gender.

GPA and Gender Interaction

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Two interactions for gender by GPA Group were observed for reading-*comprehension* and language-*expression* for cohort 2 only. The interaction appears to be driven by differences in female students performance by GPA group. The male students have a more linear trend by GPA, where as the female student performance fluctuates. The reason or reasons for the fluctuation is (are) unknown and warrant follow up investigation.

GPA and Schedule Type

No significant interactions were observed for schedule type and GPA group indicating that schedule type does not positively or negatively impact one GPA group over another. There have been unsubstantiated reports that the 4x4-semester schedule allows the lower achieving students to perform better since they have fewer courses on which to focus. On the other hand, arguments against the intensity and increased amount of content in a short period of time of the 4x4-semester schedule are unsubstantiated. The results of this study show otherwise. Neither schedule (block nor hybrid) appear to harm, lower, or decrease the academic achievement of students compared to those in a traditional schedule.

Consistency from Cohort 1 to Cohort 2

Table 3 provides a quick graphic view of similarities and differences observed between the cohorts. As can be seen in the table the observations are quite consistent from Cohort 1 to Cohort 2. Out of all the possible changes from one cohort examination to the next only seven were observed. The consistent results provide support for the argument that the different schedule types are not impacting achievement, either positively or negatively, for these students. The consistency also increases ones ability to generalize the results with similar high school population parameters.

Conclusions

The findings of this study are important in several ways. Most importantly, schedule type was not an influential factor in student achievement as it pertained to gender and GPA group. First, the results of this study indicate that schedule type does not interact with gender. This finding informs the debate over block scheduling because it supports the possibility that if other benefits of block courses are found, either achievement benefits in other subject areas or benefits in areas such as student attitudes, then educators may have the opportunity to secure these benefits without increasing whatever gender disparities already exist.

Schedule type, also, does not interact with GPA group. This result informs those considering block scheduling that the type of schedule does not appear to differentially impact students at different academic levels. It seems obvious that a school would not want to implement a program that systematically helps one group of students while at the same time systematically hurts another group. If a school desires to implement block scheduling, gender, academic level, and scheduling should not influence the decision. Rather other items that are more contextual should influence the decision to move to a block or differentiated schedule. For example, with increasing state standards for graduation, the move to a block schedule might allow those college tract students to take more electives such as AP courses, music, art, work study, business, and physical education.

Second, studies like the one we have described can alert parents and educators to gender differences and possible biases that work against large numbers of students. The gender disparities found in mathematics and reading vocabulary achievement signal that more needs to be done to explore the antecedents of these inequities. Moreover, comparing this study with previous research suggests that gender differences in mathematics are persistent, and may thus require even more concerted efforts than are currently in place.

Finally, the observation that achievement differences across schedule type were significant in only one area, mathematics-*computation*, and for only one cohort suggests variations in the effects of block scheduling across academic skills and subjects is not consistent. Given that it was the only observation for a difference in achievement based on schedule type, the overall results indicate that the schedule type does not influence achievement on these tests. Therefore, those schools considering block scheduling may want to determine other reasons for implementing the schedule. Such reasons may be class flexibility, more classes offered during the year, or attitudes towards having a block schedule. The reader is reminded that only reading, language, and mathematics were examined and the cohort make up. Different results may exist for science or the arts.

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