

Community Impacts from Other Jurisdictions Changing to Later HS Start Times, Other Local Data

Sandy Evans, co-founder of Start Later for Excellence in Education Proposal (SLEEP), December 4, 2007

One striking element in looking at reports from other jurisdictions that have changed to later high school start times is that the Community Impact issues in each are very similar to those we are facing here in Fairfax County. There were serious concerns about sports and extracurriculars (including availability of coaches, fields and gyms), child care, teacher impact, community acceptance, and disrupted parent schedules. Questions were raised about the benefits to be gained.

Followup studies and reports have shown that the jurisdictions that have made the change found few negative impacts and significant positive ones:

- High school students did get more sleep after the change
- Sports and extracurriculars were not negatively impacted (in fact, in some cases, participation and performance rose)
- Parents and teachers quickly accepted and adapted to the change, with high positive ratings by both
- Child care was not as big an issue as feared
- Students and teachers both report higher levels of student alertness and participation in class, particularly first periods
- Absenteeism and illnesses declined
- Family and peer relationships improved
- School disciplinary actions and referrals to counselors declined
- In one study, teen traffic accidents were found to decline while rates in surrounding jurisdictions rose

One exception to the smooth transition was Fayette, Ky., one of the early adopters, which had significant difficulty in reaching a consensus and in gaining community acceptance, which some observers attribute to lack of community and stakeholder involvement in the process. But Fayette is reported to be happy with the change nearly a decade after making it, and nearby Jessamine learned from its neighbor's experience and itself succeeded in having a smooth transition by taking its time and fully involving the community.

Full sources given at end.

SPORTS AND EXTRACURRICULAR ACTIVITIES:

Minnesota: Sports and activity participation stayed the same. Practices shortened. Generally positive feedback from coaches after the change, but some still firmly opposed. Some students had to leave last period of day early for away games/meets in some cases.

Excerpt of U. of Minn. CAREI Report:

In all districts with the later start in the morning, afterschool athletic and other activity practices, extended-day programs, and rehearsals were shortened, with students arriving home at a later hour than they did in 1997. However, actual **participation rates** in afterschool activities, including sports and co-curricular activities, **remained at the same levels** after the implementation of the later high school start time as they had been before the change. **Coaches and activity leaders were generally supportive of the change because they saw students who were less tired and seemingly more mentally alert at the end of the day.** A few coaches whose sports involved

long practices and traveling long distances for events were outspoken about their dislike of the later start and dismissal time for the school day.

Minnesota study (see table at end) compared three demographically similar jurisdictions with different HS start times (8:30 am, 7:25 am and 7:15 am) and found students at all three **participated in after school sports and extracurriculars at similar rates**. Concluded that later start time did not restrict participation.

Arlington: Two-thirds of students had the **same or increased participation** in extracurriculars. School staff **able to accommodate extracurriculars**, able to minimize impact.

Excerpt: (June 2005 Impact Study, summary)

1. How well did we implement?

It appears from the data that the implementation of the new start times for high schools was done reasonably well and with a minimal amount of disruption. Few parents called the APS hotline set up during the summer of 2001; and few teachers reported leaving the system to teach elsewhere because of the change to the schedule. Further, **implementation allowed students to continue participating in extracurricular activities both at the middle and high school levels**. For example, 66% of the 255 middle school students indicated that there was no difference in their participation or that they participated in more after-school activities after the start time change than they did before the change. Similarly, about **65% of the 231 high school students who were surveyed responded that there was no difference in their participation or that they were participating in more after-school activities** following the time change.

7. How effectively were the system's resources used to achieve the identified goals?

The transportation system handled the switch with minor glitches, and the **school staff did an admirable job in accommodating the changes, including minimizing the impact on extracurricular activities**.

(from body of study):

It appears from the responses of **high school students that students were able to participate in after-school activities after the start time changes**. That is, about 65% of the students indicated that either there was no difference in their participation or that they were participating more in 2001-02.

Wilton, Conn.: Sports was a serious concern upfront, but fears proved to be unfounded. Wilton saw increased sports participation and one of its best sports seasons ever. Only problem proved to be some students having to leave last period early for some away games.

Excerpt (NSF Case Study, reviewed by Wilton school system)

Wilton faced two main challenges in proposing a change in start times. First, Wilton is a self-described "**sports town**." The **Wilton Sports Council**, a body representing the interests of the little league, soccer clubs and other private sports organizations, **was a tough opponent to the change. They insisted that any change in start times would lead to the expulsion of Wilton teams from the athletic conference**, a price too high to pay for any other possible benefit. Second, there were reservations raised by the parents of younger children, who would not reap the benefits of changing starting times, especially if their children now would have to arrive earlier.

Teachers who also coached at the schools **were concerned before the change that they would be unable to make it to practices, but this turned out not to be a problem**. Wilton High School had **one of its best athletic seasons, even earning several state championships**. The high school athletic programs saw a **continued rise in participation**. Even the 35 gradeschool participation increased in extracurricular activities.

The only problems were for students who had to be **pulled out of class early for away games**, and for students who participated in more than one sport, although this full schedule would be difficult with any school start time.

Excerpts(League of Women Voters of Connecticut Concurrence Statement, 2005):

In Wilton, the percentage [of students participating in extracurricular activities] has been estimated at more than 75%. Because many student organizations and clubs meet weekly or monthly -- frequently outside of school hours, in the morning or evening, a shift in the school day schedule should affect these organizations only minimally, if at all...

8. Sports?

A school system can both maintain strong participation in interscholastic athletics and align school schedules with adolescents' biological clocks. In developing a plan for later school start times, a school district should consider creative, "out-of-the-box" approaches to the scheduling, duration, and frequency of athletic practices. For instance, **morning practices, already common for swim and hockey teams, would require only those athletes choosing to play a sport to wake up early, not the entire student body.** The **cooperation of interscholastic leagues in scheduling games is important.** Some towns have granted team members an occasional early dismissal for travel time to out-of-conference away-games. Interestingly, school systems, including Wilton, which have made the change to later start times, continue to enjoy robust participation in athletics and a great deal of success on the field.

Edina, Minn.: Excerpt (Edina public schools later start time summary): There has been no drop off in after-school sport or extracurricular activities as was predicted. In fact, there has been a slight increase.

Brevard County, Fla.: Middle School: They hold before school activities rather than after school, using own transportation.

Fairfax County:

- CIC in process of compiling current data on sports practice schedules and game schedules, field use and potential impacts

DROP-OUT RATES/AT-RISK STUDENTS:

Minnesota: declined significantly (measured by "continuous enrollment")

Excerpt: (U. of Minn. CAREI study)

Enrollment

A key finding of this study is that the percentage of high school students who were continuously enrolled in the same district or in the same school had **statistically significantly risen** since the 1995–1996 school year. Concurrently, the percentage of students who were not continuously enrolled had decreased significantly. This means that an increasing number of students were staying in the same district or in the same school for 2 or more years, and the number of students who moved in and out of the district or moved from school to school declined steadily.

The initial findings from this longitudinal study lead to important considerations for school administrators. Addressing the needs of **students who are at-risk learners, at risk for dropping out of school**, or both is a universal concern. These are often students who have insufficient credits for graduation because they have missed too many first and second hour classes. The study reveals that attendance rates improved significantly when the high schools initiated the later start time; this suggests **that changing start times is one way to recapture those students who might otherwise not complete high school.**

(no data from other jurisdictions)

ATTENDANCE/TARDINESS:

Minnesota: improved significantly for the most mobile students (those not "continuously enrolled") and for most ethnic groups, grades 9-11.

Excerpt (U. of Minn CAREI study):

In the 2-year period (school years 1995–1996 and 1996–1997) when school started at 7:15 a.m., the average rate of attendance rate for noncontinuously enrolled students in grade 9 was 72%. During the 3 years after the later start time was in effect, the average rate **climbed to nearly 76%**. This change in attendance rate was highly statistically significant (at the .001 level). That is, the change in rate is not likely to be merely a chance occurrence. **Equally notable were the improvements in attendance rates for students in grades 10 and 11.** Their combined rates moved from an average of 73.7% with the early start to 77.5% with the later start, with the largest gains seen among students in grade 11.

Excerpt:

Second, after the change in start time, **attendance improved for Asian, Hispanic, Black, and White students in grades 9 to 11.** ...Attendance rates for all ethnic groups in grade 12 were the same before and after the change in start time.

From Summary: The students benefited the most. For example, **attendance rates for all students in grades 9, 10, and 11 improved in the years from 1995 to 2000, with the greatest rate of improvement for grade 9 students.** Furthermore, students who did not have a pattern of continuous enrollment in the school district showed a marked improvement in their daily attendance rates after the initiation of the later start time in 1997–1998.

Minnesota study (see table at end*) compared tardies at three similar jurisdictions with different HS start times (8:30 am, 7:25 am and 7:15 am) and found a **significantly lower rate of tardies** due to oversleeping at 8:30 am starting school.

Edina, Minn: We have measured **fewer absences** and fewer students arriving late (Edina later start time summary)

Wilton, Conn.: Did **not** see any change in attendance or tardiness.

Brevard County, Fla.: Positive: **Significant amount of tardies and absences were reduced** from first periods.

STUDENT HEALTH/DEPRESSION: (affects community in terms of medical costs, self-medicating, etc.)

Minnesota: **Days home sick in past two weeks significantly lower** for 8:30 am start time school (0.28) compared with 7:25 or 7:15 am opening school (0.42 and 0.47, respectively).*

Minnesota: evidence of **significant improvement in depression measures (see table*)**

Minnesota: students in Edina said they ate breakfast more (CAREI case study)

Excerpt (U. of Minn. CAREI study):

The students whose high schools started at 8:30 a.m. or later reported statistically **significant less depressive feelings** on those questions than did the early start students (p ranged from $< .05$ to $< .001$.) Similarly, scores on questions measuring daytime sleepiness, the struggle to stay awake in class, and sleepiness while doing homework all showed statistically significant better outcomes for the students whose school day started later. For example, students in late-start schools reported being **less likely to arrive late to class because of oversleeping, or to fall asleep in a morning or afternoon class, or to feel sleepy while taking a test.** They also reported statistically significant fewer feelings of sleepiness when at a computer, reading, or studying. (Detailed information about these findings can be found at: http://education.umn.edu/CAREI/Programs/start_time/Vllexec_summ.html).

Many of the benefits of the later start time were similar for both urban and suburban students, with their actual scores being **nearly identical despite the differences in their local economic conditions.**

Fairfax County:

- 2005 Youth Risk Survey shows **33.9%** of Fairfax County 8th to 12th graders **show classic signs of depression** (“During the past 12 month felt so sad or hopeless almost every day for weeks or more in a row that they stopped doing some usual activities.”)
- 15% of 8th-12th graders (including 18.9% of females) had **considered suicide**

Breakfast: 2004 student survey at JEB Stuart HS:

(Analysis by Dr. Adam Winsler, George Mason University) The majority (61.1%) of student do not have enough time to eat breakfast before going to school. Only 39.9% of students eat breakfast before school every day. 89.1% of students report that they would eat breakfast if they had time or if it were available during a block of time at school.

PARENT/PEER RELATIONSHIPS/ATTITUDE:

Minnesota: improved relationships with peers and parents

Excerpt (U. of Minn. CAREI study):

High school principals were personally interviewed about what changes, if any, they saw in their schools as a result of the change to a later start. The most common response was that **the mood of the students** in the hallways, during passing times, was now **calmer**. They also cited that calmness as being evident in their student cafeterias during lunch. As a result, 5 of the 8 principals noted that they were dealing with **fewer disciplinary referrals** to their offices. With **fewer students arriving tardy**, their offices were much less congested in the morning, and there were fewer record-keeping tasks associated with tardiness and students dropping out of their first-hour classes. Seventeen school counselors and 3 school nurses also provided personal comments, noting that **significantly fewer students were coming to them to report peer relationship problems and/or difficulties with their parents**. They echoed the principals’ perceptions that the overall mood in their schools was calmer, with the students’ temperaments seeming much more even.

Parents who attended their child’s high school conference were asked to complete a written survey; about **92% of suburban parents supported the change**. Their negative comments centered on the later time that their children were now coming home after participating in afterschool activities or sports. Urban parents were interviewed in focus groups; their reactions were more mixed, often with negative comments related to changes required in work schedules and transportation limitations. Both urban and suburban parents noted that their high school **children were “easier to live with.”** They found that they were having **fewer confrontations with their children** in the morning about getting out of bed and getting to school on time. They also commented that they were having more actual conversations with their teenage children in the morning, finding that they had **new “connection time”** with their child.

One issue brought up and echoed by all respondents was that the new schedule makes **conferences between counselors and parents easier to schedule**. Parents appreciate the convenience of later meetings, and they feel more free to ask the counselor for a 4:00 PM or even later meeting.

Arlington:

Excerpt (June 2005 Impact Study): The point was raised before the implementation of new start times that the impact would be felt not only on students, teachers, and the school system as a whole, but also on families. For example, there was a **concern that with older siblings in school later, there would be an increased demand for Extended Day** or a greater

demand for the after-school Check-In Program at middle schools. **The concern turned out to be unfounded.** Extended Day staff did not see an increase in demand for Extended Day that could be attributed to the start time change.

To further examine the impact on parents, **a survey** was administered to Arlington Public Schools parents, via PTAs. The **response rate was low**: Eighteen high school parents and 18 middle school parents returned surveys. The data from the parents is therefore not included in this report. Elementary school parents were also surveyed, though their responses are beyond the focus of this evaluation for reasons discussed previously in this report.

Summary: Impact on Groups Other than High School Students

In general, it appears that **teachers and families adjusted to the change in school start times.** **Teachers did not leave the system** because of the change and there was **not an increased demand for Extended Day services.**

Wilton, Conn.:

Excerpt (NSF Case Study): Teachers recognized a change in student behavior: they were more awake, had **better attitudes** and were overall **more pleasant.** **Parents also reported changes in their kids' attitudes,** and became **increasingly supportive as they adjusted to the new routines.**

Jessamine, Ky.

Excerpt (NSF Case Study): Jessamine County **parents and students were very accepting of the results of the change.** There were very few complaints about the change, and few problems with the transportation situation...

The community, **especially the teachers,** was **supportive** of the proposed change, and has seen positive results.

TRANSPORTATION COSTS:

Minnesota: no increased bus costs

Excerpt: Transportation costs are often cited as the reason that the change will not work in a district. In fact, neither the suburban school district of Edina, Minnesota nor the urban district of Minneapolis, Minnesota, found that the change to a later start increased their transportation costs. The same buses and routes were used; the only changes made were the times the buses used the routes.

Arlington: no increase in resources

Wilton, Conn.:

Excerpt (LWVs concurrence study, 2005) Because Wilton's new schedule did not involve leasing any new buses, the implementation process was made simpler for the administration, and parents and students reported an adjustment period of only about two months to the new schedules.

Jessamine, Ky.: No additional drivers were required to make the transportation work.

Brevard County, Fla.: Did not need to increase the number of buses. The transportation time actually *decreased* between serving schools by fifteen minutes.

ACCIDENTS:

Car crashes are the No. 1 killer of teens, according to the National Highway Traffic Safety Administration (NHTSA). Experts attribute the high rate of car crashes to many factors, including inexperience, speed, risk-taking, use of drugs and alcohol, as well as drowsy driving.

A National Sleep Foundation 2006 poll of teens found that 51 percent said they have driven drowsy in the past year, and 15 percent at least once a week. (This rose to 68 percent and 20 percent, respectively, by 12th grade.) In addition, **9 percent of 12th-graders said they have actually fallen asleep at the wheel** in the past year.

More than half (55%) of all asleep-at-the-wheel car crashes involve drivers 25 and younger, according to a North Carolina study.

According to a 2007 **Children's Hospital of Philadelphia/State Farm study** of teen driving habits, based on a survey of 5,665 students: Taking the wheel without having enough sleep is not often considered to be as much of a risk as driving after drinking. However, the consequences are certainly as great for teens, who are often challenged by academic pressures, multiple extracurricular activities and early school start times. The majority of drowsy driving-related crashes are caused by drivers who are younger than 25 years.

■ **RISKY DRIVING BEHAVIORS** – Although only half of teens report seeing drunk driving by teen drivers at least sometimes, **three-fourths of respondents report seeing fatigued driving by teens.**

http://stokes.chop.edu/programs/injury/files/PCPS_Reports/1289teen.pdf

Excerpt from Advisory Council on Instruction research report:

- The frequency of crashes in which the driver was judged by state police to not be intoxicated but judged to have been asleep **are highest for young people between the ages of 16 and 20.** The **highest incidence of time of occurrences for sleepy drivers are between 5 A.M. and 8 A.M.** “Characteristics of Crashes Attributed to the Driver Having Fallen Asleep”, Pack et al. Pulmonary & Critical Care Division, Department of Medicine,

University of North Carolina. See entire Article in Resource Folder #2

- According to the NHSTSA expert panel on Driver Fatigue and Sleepiness “Young people, and males in particular, were the most likely to be involved in fall asleep crashes” (Pack et al, 1995) “Fall asleep crashes may kill more young Americans than alcohol related crashes.”(Mark Mahowald, M.D. in the quarterly *Sleep Medicine Alert*, Summer 1999, published by the National Sleep Foundation.)

Minnesota: One reason cited for switch was to lower risk of teen auto accidents

Excerpt: **Consequences of Unmet Sleep Needs (from Final Rept Summary)**

Risks for adolescents lacking sleep include daytime sleepiness, **vulnerability to catastrophic accidents** (echoed by Dr. Mark Mahowald, director of the Minnesota Regional Sleep Disorders Center at Hennepin County Medical Center in Minneapolis), mood and behavior problems, **increased vulnerability to drugs and alcohol**, and development of major sleep disorders (Carskadon, 1990).

Fayette, Ky.:

This study also looked at the rate of traffic accidents in the school system before and after the change to a later start. While the statewide rate of crashes increased 8% over the two years after the change, Fayette County, which was previously one of the counties with the highest crash rates, **reduced its crashes by over 15%.**

Summary from study accepted for publication in Adolescent and Family Health (courtesy of Dr. Fred Danner, U. of Ky.)

Discussion

Moving the school start time one hour later for all of the adolescents in one large county school district (the only county to do so during the period of this study) resulted in meaningful increases in sleep time, an increase in the percentage of students who got an adequate amount of sleep (8-9 hours cf., Carskadon, 1999) and a decrease in catch-up sleep on weekends. It was also **associated with a significant drop in auto collision rates for high school aged drivers** in that county, while crash rates increased in the rest of the state during the same time period. These findings are not necessarily causal since they are not the result of a direct assessment of the sleep habits of drivers who did and did not have accidents. However, these data are consistent with the idea that allowing adolescents to sleep more on school nights by delaying the start of school not only results in them sleeping more but also may have a measurable positive effect on their driving safety.

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Fairfax County: (1998 Task Force, pp 24-26):

Driving A higher risk of morbidity and mortality is associated with chronic sleep deprivation in that most common of adolescent preoccupations - driving. In a study of driving behavior, Dr. David Brown, Director of the Center of Sleep Evaluation at Optima Health in Manchester, NH reported that 17percent of 166 high school drivers reported having fallen asleep at the wheel at least once. Some 64 percent of students surveyed believed that sleep deprivation worsened their school performance, but only 35 percent felt that sleep deprivation impaired their ability to drive. This is a potentially life threatening misconception according to Dr. Brown. It may not be until a student experiences a close call or accident that the danger of sleepiness will be appreciated. In the study, "Characteristics of Crashes Attributed To The Driver Having Fallen Asleep," 55 percent of these accidents were with drivers 25 years of age or younger, and the peak age was 20 years old. There were almost an equal number of accidents for those 18 and 19 years of age. The study notes that the **"high rate of fall-asleep crashes in young drivers is probably the result of them being excessively sleepy due to sleep deprivation secondary to lifestyle."** The study goes on to note that sleepiness in the driver, even if the driver does not fall asleep, "degrades performance with reduced vigilance, slowed reaction times and attention deficits." The result is that there may be even more accidents where sleepiness has played a role than the actual number of fall-asleep crashes. This study was conducted in the state of North Carolina where police officers note the physical condition of the driver in an accident report. The codes include "fatigued" and "asleep" (Pack et.al., 1994).

According to the U.S. Department of Transportation National Highway Traffic Safety Administration, there were 269 reported deaths in 1996 for drivers between the ages of 15 to 19 in which the factors of drowsiness, sleepiness, asleep at the wheel or fatigue were involved. A high percentage of Fairfax County high school students drive to school each day. In conversations with **parents, a high percentage expressed their concern about their children driving to school, especially in the winter when it is still dark and roads can be hazardous.**

A Survey of Factors Influencing High School Start Times

by Amy R. Wolfson and Mary A. Carskadon)

Excerpt:

Undoubtedly, high school students have an extremely difficult task to obtain an optimal (~9.2 hours) or adequate (~8.5 hours) amount of sleep on school nights when schools start very early in the morning. Many teenagers are behaviorally and physiologically not ready to fall asleep until 11:00 p.m. or later and are biologically programmed to be asleep when school begins. As a consequence, many students fall asleep in early morning classes, and **they may also fall asleep behind the wheel driving to school. Sleepiness-related crashes are most common in drivers age 16 to 25, particularly boys** (Pack et al., 1995). Overall, many adolescents confront a major challenge if schools begin earlier than 8:30 a.m.; many schools start too early in the morning for adolescents to get adequate sleep, whether in the United States or in other countries such as Canada, Israel, Brazil, or Italy (Andrade & Menna-Barreto, 2002; Carskadon & Acebo, 1997; Epstein et al., 1998; Giannotti & Cortesi, 2002).

CHILD CARE:

Arlington: (June 2005 Impact Study, Summary)

5. What happened that was unexpected or unintended?

An unexpected outcome was the **lack of added demand placed on Extended Day** and the paucity of complaints registered by parents and families.

Summary: Impact on Groups Other than High School Students

In general, it appears that teachers and families adjusted to the change in school start times. Teachers did not leave the system because of the change and there was **not an increased demand for Extended Day services**.

Fayette, Ky.: (from NSF Case study, reviewed by school district)

The most vocal opponents to the late start were the parents of younger children who would lose their supervision after school. *[No follow study on how this worked out, other than that the community is happy with the change.]*

Jessamine, Ky.: The only complaints were about childcare for younger students. The local YMCA responded by offering before-school care for middle school students who now had the latest start times.

Brevard Co., Fla.:

Negative: After school care needs increased.

Positive: Eliminates before school care needs.

Middle School: They hold before school activities rather than after school, using own transportation.

Fairfax County: Data from 2004-2005 parent and student surveys at JEB Stuart High School, one of the most diverse in the county with a high percentage of low-income students, indicate that later school schedules will have **little impact** on student jobs, parent work schedules or **child care arrangements**.

- **Nearly 90 percent of parents said a later school day would not cause a problem for their work schedule or current child care arrangements.** Of the few for whom there was a potential problem, only about a quarter said it would be difficult to make a change. The net result is that less than 3 percent had a conflict that they believed would be hard to resolve.

JOBS/EMPLOYERS:

Minnesota (interviews before the change)

Excerpt from Minnesota Start Time Study:

Employers Report (N=15)

The overall impression that the employers, managers and human resource workers gave was that there would be **little or no impact** from a later school dismissal time. Four employers stated there would be an impact in the after-school work shifts, but when asked if a one hour later start time would have an impact, three said that one hour would not make much of an impact, that they "could deal with it" or that they are "flexible." Most of the employers said that their high school employees either do not start right after school or that they could "adjust the day workers" shifts to accommodate a later arrival of the students.

Fairfax County: Data from 2004-2005 parent and student surveys at JEB Stuart High School, one of the most diverse in the county with a high percentage of low-income students, indicate that later school schedules will have **little impact on student jobs, parent work schedules** or child care arrangements.

- Of the 23 percent of Stuart students who work, the **average start time for work on a school day was 4:22 pm, more than two hours after the current school end time.** Students now start work as late as 9 pm on school days (with a later morning start time presumably being easier on students working so late in the evening).
- In the Stuart parent survey, **nearly 90 percent said that a later school day would not conflict with a job held by their student.** Most of the remainder said it would be easy for their students to change work hours to accommodate a later schedule.
- The **1998 Task Force** interviewed local employers and concluded that later start and end times **would NOT interfere with student work opportunities.** They found that employers generally use student workers on weekends and evenings, schedules that would not conflict with later end times (see pp 26-28).

Excerpt: (1998 Task Force Report, pp 27-28): In a poll of fifteen Fairfax businesses employing high school students, they were unanimous in stating that the **later start time would not impact student work hours** and that they would continue to hire students.

The following employers were contacted: 1. Baskin Robbins Ice Cream 2. Bath and Body 3. Blockbuster Video 4. Burger King 5. Friendly's 6. Giant Food Stores 7. K-Mart (Burke) 8. Kohls 9. Multiplex Movie 10. Penney's (Fair Oaks) 11. Safeway 12. Subway 13. Taco Bell 14. Target (Burke) 15. TCBY

Also, most parents report that their children do not work out of need, but rather to pay for gas money, CDs, cigarettes and other niceties that the parents might not otherwise pay for. Dr. Carskadon substantiated this fact in her presentation to the Task Force when she stated that most students don't work to save for college or to supplement family income, they work to buy personal consumables. Also, students work at jobs that are usually unskilled, entry level positions. In most cases, those who depend upon their jobs to provide money for their family would be able to continue working.

JUVENILE CRIME and GANG ACTIVITY/PUBLIC SAFETY:

A 2006 report from the U.S. Department of Justice Office of Juvenile Justice and Delinquency Prevention shows that **both juvenile violent crime and juvenile victimization peak in the afternoon hours after school.** Concludes there is more potential to filling 3-7 pm time than in juvenile curfews (go to beginning of Chapter 3):

<http://www.ojjdp.ncjrs.gov/ojstatbb/nr2006/downloads/chapter3.pdf>

<http://www.ojjdp.ncjrs.gov/ojstatbb/nr2006/index.html>

- **Arlington** (from Advisory Council on Instruction report)
 - The opportunity that **early dismissal present for anti-social, criminal and high-risk** behavior has also been cited as a concern. According to Arlington County Deputy Police chief John Haas, “We would love to see down time between high school dismissal time and the start time for extracurricular activities eliminated entirely, thus eliminating opportunities for mischief and criminal activity.

Minnesota:

found fewer referrals for disciplinary action at schools (see Peer Relationships above)

TEEN SLEEP IMPACTS:

Teens get significantly more sleep per school night with later start time. While people often assume students will just stay up later rather than get more sleep, the research shows this is not the case. Students in jurisdictions that have made the switch have been found to go to bed at or near the same time as they did before, and therefore do get more sleep.

Report in **Pediatrics**, June 2005: Excessive Sleepiness in Adolescents and Young Adults: Causes, Consequences, and Treatment Strategies, Richard P. Millman, MD Working Group on Sleepiness in Adolescents/Young Adults; and AAP Committee on Adolescence
http://pediatrics.aappublications.org/cgi/content/full/115/6/1774?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=Millman&searchid=1118157331105_7743&stored_search=&FIRSTINDEX=0&volume=115&issue=6&journalcode=pediatrics

Excerpt: **Early high school start time is a significant, externally imposed constraint on teenagers’ sleep/wake schedules**; for most adolescents, waking up to go to school is neither spontaneous nor negotiable. Szymczak and colleagues³⁵ followed Polish students between 10 and 14 years of age for more than 1 year and found that all of them slept longer on weekends and during vacations by extending their sleep and waking up later. These investigators concluded that the school schedule was the predominant determinant of wake times for these students.

Similarly, several surveys of high school students have found that students who start school at 7:30 AM or earlier obtain less total sleep on school nights because of earlier rise times.^{31,36-38}

In a laboratory and field study, Carskadon and colleagues³⁹ evaluated the effect of a 65-minute advance in school start time on approximately 40 9th-graders in their transition to 10th grade. Specifically, junior high school started at 8:25 AM and high school started at 7:20 AM in a large urban school district. Sixty-two percent of the students in 9th grade and less than half the students in 10th grade got an average of as much as 7 hours of sleep on school nights. Students awoke earlier on school days in 10th grade than in 9th grade and had shorter sleep latencies on the MSLT in 10th than in 9th grade, particularly on the 8:30 AM assessment. In addition, 16% of participants experienced 2 REM episodes on the MSLT in 10th grade (48% of subjects experienced 1 REM episode). The occurrence of REM sleep episodes on the MSLT was associated with a delayed timing of melatonin secretory pattern in these adolescents. In a study of nearly 600 young adolescents (10–12 years of age), Epstein and colleagues⁴⁰ compared a 7:10 AM with an 8:00 AM school start time. In their survey, children with early start times reported significantly shorter mean sleep times (ie, approximately 25 minutes less) than did children who started school after 8:00 AM.

Minnesota: Studies found Minneapolis students with an 8:40 am start time got **an hour more sleep per school night** than students in comparable high schools that started an hour earlier. Follow-up three years later found that the students with later start times were still getting an hour more sleep per school night:

Excerpt (Minneapolis Public Schools Start Time Study, Executive Summary, August 2001)
Student Survey - Preliminary Results

The School Sleep Habits Survey developed by Bradley Hospital at Brown University was administered to a stratified random sample of Minneapolis Public School 9-12th graders in December, 1997 (school year 1997-98) and again in January, 2001 (school year 2000-2001). All students in both years attended schools with 8:40am start times. This data set is currently being analyzed, however several initial findings are noted:

- Students in the 1997 survey reported a mean school day bedtime of 10:48pm. This time is statistically similar to the 2001 reported a mean bedtime of 10:41pm.
- Students in 1997 reported a mean weekend bedtime of 12:40am, statistically similar to the reported weekend bedtime of 12:42am in 2001. Likewise, students in 1997 reported a mean weekend wakeup time of 9:51am, while students in 2001 reported a mean weekend wakeup time of 9:49am, not a statistically significant difference.
- The impact of circadian rhythms and similar weekend schedules (i.e. work, social, family) in both years are likely contributing to the similar wake up and bedtimes.
- Minneapolis high school students continue to get **an hour's more sleep each school night or obtain five more hours' sleep per week** than students whose high schools begin an hour earlier than Minneapolis schools. This finding supports the medical researchers' finding that nearly all teenagers become sleepy at about 11:00 PM. **It also lays to rest the fears and expectations that a later start would mean that Minneapolis students would just end up staying up an hour later on school nights.**

<http://cehd.umn.edu/CAREI/Reports/docs/SST-2001ES.rtf> (Executive Summary)

<http://cehd.umn.edu/CAREI/Reports/docs/SST-2002Bulletin.pdf> (see pp. 12-14)

Wilton, Conn.: High school students got **35 minutes more sleep** on average after 40-minute later start time change.

Excerpt (NSF Case Study, with review by Wilton school system): The results have been impressive: **students are getting more sleep and are healthier and happier.**

The following fall, the local sleep disorders center administered a sleep survey in the high school, with results showing that the students were, in fact, sleeping an extra hour each morning.

The Norwalk Hospital Sleep Disorders Center, which conducted the sleep study before the change, continued with a follow up survey to assess the impact. They used a truncated version of the self-administered School Sleep Habits Questionnaire, which asked questions about sleep, sleepiness and grades. The results have shown that Wilton High School students are **getting 35 minutes more sleep than before the change.** The number of students who reported that daytime sleepiness was not a problem doubled. Their bedtimes did not change.

Fayette, Ky.:

Excerpt (NSF Case Study): Students in every grade from 6-12 averaged more sleep in the year after the change, **up to 50 extra minutes in the 12th grade.** The **percent of high school students getting at least eight hours of sleep per night went from 21%-51%.**

TEEN ACADEMICS IMPACTS: Students more alert, participatory and ready to learn.

General: (U. of Minn. CAREI report, Vol. 1)
Cognition and Sleep Loss

There is much empirical literature available that points to the connection between cognition and sleep loss. It has been shown that sleep deprivation is associated with memory deficits (Dinges & Kribbs, 1991; Nilsson, Backman & Karlsson, 1989), impaired performance and alertness (Carskadon & Roth, 1991; Dinges & Kribbs, 1991), as well as time-on task decrements and optimum response shifts (Dinges & Kribbs, 1991). The specific loss of REM sleep has also resulted in memory loss (Smith, 1995; Li, Wu, Shao & Liu, 1991). Dujardin, Guerrien & Leconte (1990) found that REM sleep affects information processing, while Maas (1995) listed the consequences of REM sleep loss as including: unintended sleep, increased irritability, anxiety and depression, decreased socialization and humor, hyper sexuality, mental fatigue with reduced memory concentration, and decreased ability to handle complex tasks and be creative.

Time of Day for Learning

Dunn (1995) does believe that time of day has an effect on learning. In fact, utilizing Dunn's Learning Styles Inventory assisted one school in changing the time of day that various instruction was held and, consequently, dramatically improving learning and reducing behavior problems (Stone, 1992). It is suggested by Kraft & Martin (1995) that performance typically peaks in the afternoon, though others believe this depends on the individual.

Conclusions

Clearly, several issues have emerged. There is **mounting medical evidence that amount of sleep, time of day, and circadian rhythms do play a part in how prepared an adolescent is to learn.**

Arlington (June 2005 Impacts Study, Summary)

Excerpt: 2. What changes happened for the intended recipients?

Survey data from students suggest that high school **students were more ready to start school, were more alert, and participated in class discussions and activities more frequently after the change in start time than in the year prior to the change.** This trend was **especially apparent with regard to class participation.** Forty-two percent of the high school students reported that they participated in discussions or activities during their first period class "all of the time" during the 2001-02 school year. In contrast, only 31% of these students responded in the same manner when they were asked about the 2000-01 school year.

Likewise, **high school teachers reported dramatic increases in the number of first period students who were alert, prepared, and participatory.**

8. How well was our approach validated?

The school start time change was made upon the recommendation of the ACI [*Note: Instruction staff*] and after considerable deliberation by the School Board and senior officials of the Arlington Public Schools. Research on the impact of school start times and adolescent behavior guided the decisions about changing the schedules, and **this study concludes that the change had its desired impact on the main beneficiaries, high school students.** On the other hand, the compromises that went into the switch, especially vis-à-vis middle school students [*Note: switching MS to an earlier time*], seem to have kept adverse consequences within acceptable limits.

9. Is this the most effective way to achieve success?

It appears this change came at the expense of middle school students (many of whom are also adolescents) [*Note: MS switched to earlier time, before HS*], and **a more effective approach might have been to shift elementary start times.** Given the complications of bus schedules and parent's work schedules, this was not possible.

Summary: Start Time's Impact on Academic Achievement as Measured by Grades, Absences, Times Tardy and Perceptions

- **The first period grades** of both cohorts of high school students—that is, the classes of 2003 and 2004—**improved slightly** after the start time change in 2001. The change, however, was so slight that it **did not represent a change in letter grades** for the students.
- In addition to students' grades and rates of absenteeism and tardiness, students' and teachers' perceptions of factors that may influence academic performance also were examined. In general, **more high school students reported feeling ready to start school and alert during their first period class** after the school start time change
- These student responses seem to be **reinforced by the high school teachers' perceptions. Higher percentages of teachers agreed that their students were more alert, prepared, and participatory** after the start time change than before.

Arlington: Start time issue was initiated by the Advisory Council for Instruction, which reviewed research and in Dec. 1999 recommended a later high school start time for reasons of student achievement, health and safety.

Excerpt of 1999 report:

We strongly believe that continuation of the early start time for high school students is detrimental to student achievement, health and safety. We believe that the evidence in favor of adjusting the school day to the biological needs of young people is overwhelming.

http://www2.apsva.us/1540108292149610/lib/1540108292149610/hs_start_time_report.pdf

Arlington: (my review)

Can't make too much of this--so many factors involved, ups and downs are normal, demographics important, etc. etc.--but for what it's worth Arlington County did post higher increases in SAT scores following the change than Virginia as a whole (2001 to 2004 Arlington Math scores rose 19 points, 523 to 542, compared with 5 points for Va; 2001-2004 Arlington Verbal rose 35 points, 518 to 543, versus 8 points for Va. (For Black students, math increase was +28 points compared with +14 for Blacks in Va., verbal was +16 point compared with flat for Va. For Hispanic students, was +13, compared with flat for Va. and +12 compared with +2 for Virginia.)

Minnesota: found slight grade improvement but not statistically significant. Kids more alert, prepared for first class (see above)

Excerpt (Changing Times: Findings From the First Longitudinal Study of Later High School Start Times Kyla Wahlstrom NASSP Bulletin _ Vol. 86 No. 633 December 2002)

Given the numerous obstacles to obtaining "clean" data, the analysis took nearly a year. In the end, the comparison of students' letter grades for 3 years prior to the change (starting time of 7:15 a.m.) and 3 years after revealed **a slight improvement in grades earned overall, but the differences were not statistically significant.** The **trend lines** for letter grades earned for all grade levels 9 through 12 for the years of the later start time are **on an upward (positive) slope.** Students' self-report from a written survey on their grades earned corroborate this finding.

Edina, Minn:

Excerpt (Edina Later Start Time Summary): Parents, students and staff all agree it has been a good change. It is unusual to have so much agreement about an issue in education today.

Teachers report **more alert students and improved learning** beginning at 8:30 as compared to the 7:25 start.

Excerpt: (CAREI Case Study on Edina: There seemed to be a general agreement among all eight [teachers] who said that, during first hour, they doesn't have "people with their heads down on the desk, they seem to be more engaged in what they're doing; they seem to be more focused."

A few students said they are doing better academically because they are more awake. One student shared, "I have only fallen asleep once in school this whole year, and last year I fell asleep about three times a week." Another student added that she's "more alert and doesn't 'zone out' as much." On a similar note, a student said, "I feel I pay better attention because my sleep schedule is closer to my normal sleep pattern." Two students added that it feels a lot better now that they leave for school when it is light out, whereas last year during the winter it was dark when they left for school.

General: Too early start times interfere with learning

Excerpt (A Survey of Factors Influencing High School Start Times, NASSP Bulletin ■ Vol. 89 No. 642 March 2005 Amy R. Wolfson and Mary A. Carskadon)

Our data indicate that at least as far back as 1986, the majority of the high schools started too early in the morning for most adolescents' sleep needs and schedule, as well as daytime functioning. Many high school and middle level students cannot get to sleep early due to a combination of biological and psychosocial factors, such as homework hours, after-school activities, and family schedules. In addition, **starting school early in the morning interferes with learning, particularly during the first few classes of the day.** School administrators note that many factors prevent adjusting start times later for adolescents, putting the onus for coping with the start time entirely on the students and their families.

BEFORE and AFTER-SCHOOL ASSISTANCE:

Arlington:

Excerpt: (June 2005 Impact Study) About half of the high school teachers who responded to the teacher survey indicated that they saw about the same number of students before school in 2001-02 as they did in 2000-01. About 13% indicated that they saw more students before school and about 13% indicated they saw fewer students before school in 2001-02. Twenty-five percent of the teachers reported "no opinion" on this item.

When asked about the number of students they help after school, about 35% of the high school teachers responded "about the same number of students" compared with "last year." About 13% reported helping more students after school whereas about 38% reported seeing fewer students after school during the 2001-2002. About 12% of the teachers selected the "no opinion" response option on this item.

COMMUNITY ACCEPTANCE:

Minnesota: Parents who attended their child's high school conference were asked to complete a written survey; about **92% of suburban parents supported the change.**

Excerpt: (get citation) The process of change is unsettling to most people; change interferes with feelings of stability and continuity. When routines are upset, it is human nature to react negatively. . . . Nevertheless, the fact that later school start times can now demonstrate some positive long-term effects should cause districts to seriously consider

whether such a change might be feasible for them.

Arlington: (June 2005 Impact Study, Summary)

1. How well did we implement?

It appears from the data that the implementation of the new start times for high schools was done reasonably well and with a **minimal amount of disruption**. **Few parents called the APS hotline set up during the summer of 2001.**

5. What happened that was unexpected or unintended?

An unexpected outcome was the lack of added demand placed on Extended Day and the **paucity of complaints registered by parents and families**. Although not included in the data analyzed for this report, an information telephone line was set up prior to the start time change to answer parents' questions and gauge the community's attitudes about the change. Few parents called the information line with questions or concerns.

6. How satisfied were the users and clients?

Based on analysis of survey data, the **high school students seemed satisfied** with the change; and the middle school students were less satisfied. *[Note: MS students were changed to an earlier time.]* For example, 42% of the 231 high school students indicated on the survey that they liked the 2001-2002 start time better than the 2000-2001 start time. Only 22% of the 255 middle school students expressed the same preference.

Arlington (before forming its working committee, Arlington's Advisory Council on Instruction did research and made a recommendation. Part of its research included a telephone survey of high school parents as well as surveys of middle school and elementary school parents and of high school students.)

Excerpt from 1999 report:

Key Points [of high school parent survey]:

1. 60% of the respondents were concerned about their teenager being too sleepy to learn effectively at 7:30 in the morning.
2. About 75% of the respondents favored a later start time. The most popular start times were 8:30 (34%) and 8:00 (26%). About 20% favored the current start time.
3. For the "least popular" start time, 52% chose "later than 9:00" and 31% chose 7:30. Nobody chose 8:00 or 8:30 as the worst time.

Wilton, Conn.:

Excerpt (NSF Case Study): The new schedule was implemented in the fall of 2003. Because Wilton's new schedule did not involve leasing any new buses, the implementation process was made simpler for the administration, and **parents and students reported an adjustment period of only about two months to the new schedules.**

The three impacted schools — middle, high and upper elementary — participated in a survey initiated by the Parent Teacher Student Association that was presented to the Board of Education at the end of the first year of the new schedule. **Large majorities at all three schools reported satisfaction with the change.**

Excerpt: (LWVs of Connecticut Concurrence study, Sept. 2005):

At the close of the first year of the new start time, Wilton's PTAs surveyed the high school, middle school, and upper elementary school communities to determine satisfaction with the new start time. **Responses at all three schools were overwhelmingly positive.** Also, the Norwalk Hospital Center for Sleep Disorders did surveys of WHS students' sleep patterns before and after the time change. Wilton students report getting an average of 55 minutes more sleep each night after the change. The League of Women Voters has held morning coffee meetings with the principals from all three affected schools to gauge progress over the past two years, with very positive reports from all. **During the first year, there were occasional complaints about**

athletes being late for “away” athletic events. Also, during the second year, in response to parental concerns, the Board of Education adjusted the early bus pick-up times for Wilton’s upper elementary school. More importantly, however, **no one questions the benefits** of the change for Wilton’s middle school and high school and no one has recommended returning to the former schedule.

Fayette, Ky.: [Had a very rocky decision-making process, strong opposition and changing decisions from School board, according to NSF.]

Excerpt (NSF Case Study): Now, seven years after the change, you would have a hard time getting Fayette County to go back. **Everyone has adjusted to the different routines, and the students and parents appreciate the more healthy approach to education.**

Jessamine, Ky.: Learned from the difficult experience of nearby Fayette, took its time and involved many stakeholders. Educated community on teen sleep needs. Did extensive surveys (using nationally recognized survey tools) of teen sleep habits and of staff and parent views. Jessamine County parents and students were very accepting of the results of the change. There were very few complaints about the change, and few problems with the transportation situation.

Excerpt (NSF Case Study): The implementation of the change was very smooth. Because Jessamine took their time in studying the issue and included all important decision makers in the process (including transportation directors), the changes were made easily and with little opposition. No additional drivers were required to make the transportation work. The only complaints were about childcare for younger students. The local YMCA responded by offering before-school care for middle school students who now had the latest start times.

Edina, Minn: *Excerpt* (Edina Later Start time summary): Parents, students and staff all agree it has been a good change. It is **unusual to have so much agreement about an issue** in education today.

TEACHER IMPACT:

Arlington: *Excerpt* (June 2005 Impact Study)

III. IMPACT ON OTHER GROUPS OR SCHOOL LEVELS

Evaluation Questions

3a: To what extent did the change in high school start time impact students at other levels? 3b: How do teachers and parents perceive the change in start times?

Teachers and other staff were also impacted by the change in start times. **Rush hour commuting, childcare, coaching, and other factors were raised as barriers to changing the school start times.** In an effort to retain teachers, the school system provided some options to help ease the transition. Success of these initiatives should show that no teacher left the Arlington Public Schools because of issues relating to changing the start times.

About 75% of both high school and middle school teachers indicated that the change in school start times did not cause them to consider changing the level they teach or where they teach. Similarly, few teachers (under 10%) responded that they seriously considered teaching at another level. However, about 13% of the high school teachers and 10% of the middle school teachers did report that they considered teaching in another county as a result of the change. We do not know from these data if any teachers did switch positions because of the time change. According to the Department of Personnel Services, **no teachers left Arlington Public Schools in 2001-2002 citing the change in start times as the reason for their departure.**

Summary: Impact on Groups Other than High School Students

In general, it appears that **teachers and families adjusted** to the change in school start times. **Teachers did not leave the system because of the change** and there was not an increased demand for Extended Day services.

1. How well did we implement?

It appears from the data that the implementation of the new start times for high schools was done reasonably well and with a minimal amount of disruption. Few parents called the APS hotline set up during the summer of 2001; and **few teachers reported leaving the system to teach elsewhere because of the change to the schedule.**

2. What changes happened for the intended recipients?

Survey data from high school teachers seem to reinforce these findings related to students' behavior. Higher percentages of **teachers** agreed or strongly agreed with the statement **that their first period students were alert, prepared, and participatory in 2001-02** than agreed with the statement as it applied to their students from the previous year (before the time change).

IMPACT OF PUTTING MIDDLE SCHOOL FIRST:

Arlington: Problem with late buses for MS, ran up against other runs. Solution: after-school for MS divided into two periods and half-time positions added.

Excerpt (June 2005 Impact Study): Middle schools, however, started the school day 20 minutes earlier than they had prior to the change, and now end the day at 2:20pm. It should be noted here that since there are a limited number of buses and drivers available during the peak time of 3:15-4:00, **the school system is not able to provide late buses for middle schools before 4:00.** As a consequence, middle school students involved in after school activities wait 30 to 45 minutes for bus transportation home. To accommodate this lag time, middle schools divided after-school time into two activity periods, and half-time positions for activity directors were added to coordinate the after-school time.

Sources/links:

Minnesota:

<http://cehd.umn.edu/CAREI/Reports/docs/SST-2002Bulletin.pdf>

<http://cehd.umn.edu/CAREI/Reports/summary.html#SchoolStart>

<http://cehd.umn.edu/CAREI/Reports/docs/SST-1998VI.pdf>

<http://cehd.umn.edu/CAREI/Reports/docs/SST-1998VII.rtf>

Edina, Minn.:

<http://www.edina.k12.mn.us/news/reports/laterstart/summary.htm>

Arlington:

Arlington Public Schools

Impact of 2001 Adjustments to High School and Middle School Start Times (June 2005)

<http://www2.apsva.us/1540108292149610/lib/1540108292149610/report0605.pdf>

Advisory Council on Instruction High School Start Time Study Committee report (Dec 1999, initiated Arlington start time effort):

http://www2.apsva.us/1540108292149610/lib/1540108292149610/hs_start_time_report.pdf

Wilton, Conn. (NSF Case study, reviewed by Wilton school system; League of Women Voters of Connecticut Concurrence Study)

http://www.sleepfoundation.org/site/c.hulXKjM0lxF/b.2511905/k.80A2/Changing_School_Start_Times_Wilton_Connecticut.htm

<http://serv01.siteground126.com/~wiltonlw/images/stories/MiscPDFs/lwvctconcurrency.pdf>

Fayette, Ky.:

http://www.sleepfoundation.org/site/c.hulXKjM0IxF/b.2511919/k.E074/Changing_School_Start_Times_Fayette_County_Kentucky.htm

Jessamine, Ky.:

http://www.sleepfoundation.org/site/c.hulXKjM0IxF/b.2511911/k.DCEB/Changing_School_Start_Times_Jessamine_County_Kentucky.htm

Brevard County, Fla.

Information from personal interview (full report available on request):

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<http://cehd.umn.edu/CAREI/Reports/docs/SST-1998VII.rtf>

***Table 1: Districts and Start Times**

Items/Scales from Sleep Survey	District A 8:30am	District B 7:25am	District C 7:15am	All 17 School Districts
School Day Rise Time	7:06am ¹	6:08am ²	5:58am ³	6:11 am
School Night Bedtime	11:21pm ¹	11:20pm ¹	11:09pm ¹	11:08 pm
School Night Sleep Total	7 hrs, 46 min ¹	6 hrs, 47 min ²	6 hrs, 48 min ²	7 hrs, 2 min
Daytime Sleepiness	2.101	2.452	2.973	2.50
Sleepiness Scale (#43)	14.861	15.861	17.742	16.56
Struggled to stay awake or fallen asleep (school related items from #43):				
reading, studying, doing homework	1.951	2.121	2.612	2.23
during a test	1.211	1.341	1.572	1.44
in a class at school	1.981	2.24ns	2.482	2.38
while doing work on a computer or typewriter	1.171	1.32ns	1.422	1.31
Sleep Behavior Scale (#45)	19.191	21.022	22.843	21.71
In the last two weeks, how often have you (#46):				
arrived late to class because you overslept	1.491	1.912	2.022	1.71
fallen asleep in a morning class	1.571	1.952	2.012	2.02
fallen asleep in an afternoon class	1.451	1.70ns	1.852	1.84
Depression Scale (#46)	9.961	10.431	11.432	10.59
Days Home Sick Over 2-weeks	0.281	0.421	0.471	0.40

#21				
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NOTE: Different superscript values indicate a statistically significant difference between row means at $p < .05$. "ns" superscripts indicate that this district's mean is not significantly different from either of the other two district means (e.g., for item "School Day Rise Time" each of the three means are significantly different from each other; for the sub-item "struggled to stay awake in class at school" District B was not significantly different from either District A or C, but District A is significantly different from District C).

<http://cehd.umn.edu/CAREI/Reports/docs/SST-1998VII.rtf>

Table 4. Comparison of Three Demographically Similar High Schools (grades 10-12):

District A: 8:30 am start time

District B: 7:25 am start time

District C: 7:15 am start time

Hours of organized sports during the week similar:

A: 3 hours/16 mins

B: 4 hours/14

C: 3 hours/10 mins

Hours of extracurriculars during school week similar:

A: 2 hrs/44

B: 1 hour/32

C: 2 hours/48

Discussion of Table 4: After School Activities

For the most part, the **later start time for District A does not seem to be restricting student participation in after school activities** such as organized sports and extracurricular activities.

BEFORE AND AFTER START TIMES IN JURISDICTIONS MAKING CHANGE:

Jurisdictions that have succeeded in switching from an early to a later high school start time have generally put high school on the middle of three tiers, usually at 8:30 or 8:40 am.

Middle school in some cases has gone early (7:45-7:50 am), but more often later (8:50-9:30 am)

Elementary school is sometimes placed early (7:30 am-8 am), spread over a range (Arlington/Minneapolis), and less often late (9:20 am in Edina)

Minneapolis, Minn.

Old: HS, 7:15 am

New: **HS, 8:40 am**; ES, 7:30-9:10 am starts; MS, 9:30-4 pm

Edina, Minn.

Old: HS, 7:20 am

New: **HS, 8:30 am**; MS, 7:45 am; ES, 9:20 am

Arlington, VA.

Old: HS, 7:30 am; MS 8:10 am; ES, 8:50 am

New: MS, 7:50 am, **HS, 8:19 am**; ES, 8 am/8:25 am/9 am

Fayette, Ky.:

Old: 7:30 am high school

New: 7:30/8:00 am for elementary, **8:30 am for high school**, and 9:00 am for middle school.

Jessamine County, Ky:

Old: High School-7:30 am; Middle School-7:40 am; Elementary School-8:30 am

New: Elementary School-8:00 am; **High School-8:40 am**; Middle School-8:50 am

Brevard County, Fla:

Brevard County School District has approximately 75,000 students who travel on a 3-tiered bus system – each bus has 3 routes to serve the three school levels: Elementary grades K through 6, Middle grades 7 through 8, High grades 9 through 12.

Old: High School, 7:30 AM; Middle School, 8:50 AM; Elementary, 9:50 AM
New: Elementary, 8:00 AM; Middle School, 9:15 AM; High School, 8:30 AM

Compiled by Sandy Evans, co-founder of Start Later for Excellence in Education Proposal (SLEEP), December 2007