

# **Minneapolis Public Schools Start Time Study**

## **Executive Summary**

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#### **Literature Review**

There is a substantial literature in the medical, psychological, and sociological fields which describe the sleep process and its impact on cognitive, social, and emotional development and functioning. Compelling evidence supports the contention that waking activities and events play an important role in sleep. While not yet adequately studied in children, there appears to be an inextricable relationship between sleep and daytime functioning in adults. Despite what would seem to be an obvious connection between sleep and school performance, little concerted study of the interaction of these two factors has been undertaken in the school milieu.

Current medical research contends that there exists great variation in the impact of sleep deprivation upon individuals. This must be studied in more detail to assure that contemplated changes in school policy will be sensitive to the individual needs of students. Potential implications for both professional fields appear to be profound. Sleep research has raised a number of critical questions concerning the learning process of children and youth. If indeed the speculations are valid, educators have a great deal to benefit from embracing sleep research and making it a part of educational policy and practice.

#### **Methodology**

For this study, input was gathered from a very wide range of stakeholders. Those persons include students, teachers, parents, building and central office administrators, and education assistants and support staff. Data collection strategies included individual in-person and telephone interviews, written surveys, focus groups, and a review of documents and prior information. Due to the need to focus the study because of fiscal and time constraints, the focus for the majority of the data collection was at the secondary level; however, related data was also collected at the elementary level.

#### **Student Survey**

The School Sleep Habits Survey developed by Bradley Hospital at Brown University was administered to a stratified random sample of high school students (N=471) in three Minneapolis high schools. In addition, a group consisting of Student Council Members representing each Minneapolis high school was surveyed (N=48) as well. The survey was also administered to a sample of Minneapolis middle school students (N=599) and a sample of high

school and middle school students in a comparable urban school district, identified here as District B.

### *School Week Sleep Patterns*

The findings support what is found in the literature regarding changes in start times and sleep behaviors. For example, the literature suggests that students who have a later start time report fewer depressive feelings and behaviors and less sleepiness. The average score on a sub-scale of the survey, the Depression Scale, was significantly lower for Minneapolis high school students than for District B students. In addition, the average number of days home sick over a two-week period was significantly lower for Minneapolis high school students than for District B students. Because the literature suggests that a relationship exists between sleep behavior and depression and/or student health, the later start time may be a factor in the differences observed between students in these districts.

The literature also indicates that students who attend schools with later start times will report lower levels of sleepiness in association with different school activities. There is a statistically significant difference between the values reported by Minneapolis high school students and those reported by District B students on the Sleepiness Scale and its various components. For example, Minneapolis high school students reported that they had less difficulty staying awake during classes, while taking tests, while studying or doing homework, and while working at a computer or typewriter than did District B students.

Fewer students report falling asleep in class, arriving late to school because of oversleeping, and feeling tired during the day. There are statistically significant differences between Minneapolis high school students and District B students on these measures as well.

The differences in sleep and depressive behaviors between Minneapolis and District B students may be due to the fact that Minneapolis students are getting significantly more sleep per night (7 hrs, 27 min vs. 6 hrs, 48 min). Although this amount is on average only 45 minutes more than the amount reported by District B students, it may be even more important that Minneapolis students acquire this extra sleep at a critical point in the sleep cycle, which is supported by the difference in rise time between these two groups.

Apparently Minneapolis Student Council Members do not reap the full benefits of the later start time. For example, the Minneapolis Student Council Members report significantly higher values on the Sleepiness Scale and on the Sleep Behavior Scale than do Minneapolis high school students in general. Thus, the reported levels of sleepiness for Minneapolis Student Council Members more closely resemble the levels reported by District B students. This finding may be generalizable to other students who are very active in other high school activities; that is, Student Council members, as well as athletes and students involved in other school-related extracurricular activities, may use their time differently than the general student population.

Note, however, that there is no significant difference between Minneapolis high school students in general and Minneapolis Student Council Members in terms of the amount of time slept on school nights. There is also no significant difference between these two groups in terms of school day wake time. Thus, Minneapolis Student Council Members benefit from the later school start time in terms of these variables.

### *Student Academic Achievement*

As part of the School Sleep Habits Survey, students were asked to indicate the letter grades they obtain most often in school. These self-reported grades are on an 8-point scale, where A = 8, A- = 7, B+ = 6, B = 5, B- = 4, C+ = 3, C = 2, C- = 1, D+ and below = 0. Students in Minneapolis report getting higher grades than do students in District B. There are many possible reasons for this difference, one of which could be due to the extra hour of sleep. It may also be that Minneapolis has more grade inflation than District B. Minneapolis Student Council members report getting higher grades than Minneapolis high school students in general. One possible reason for this may be the type of student who serves on the Student Council. Note, however, that even though students in Minneapolis report getting higher grades than do students in District B, Minneapolis students spend less time doing homework than do students in District B. That is, District B students spend more time doing homework during the school week than either Minneapolis high school students or the Minneapolis Student Council members. District B students also spend more time doing homework on the weekends than Minneapolis high school students. This finding lends support to the suggestion made above that Minneapolis may have more grade inflation than District B.

#### *After School Activities*

In terms of after school activities other than homework, start time does not seem to be restricting student participation in organized sports. If anything, Minneapolis students spend more time than those in District B, on average, participating in organized sports during the school week. Minneapolis Student Council Members spend the most time participating in organized sports during the school week compared to the other two groups. This finding is not related to school start time, which, to reiterate, does not appear to restrict student participation in organized sports. Also there is no statistical significance between the amount of time spent participating in extracurricular activities on the weekend among these three groups. This finding also supports the assertion that school start time is not restricting student participation in extracurricular activities.

#### *Middle School Comparisons*

Perhaps the most important information discovered is that there are not many variables on which these two districts differ significantly, despite the fact that the start times are dramatically different (i.e., Minneapolis middle schools start at 9:40 AM and District B middle schools start at 7:30 AM). However, the findings that do demonstrate statistically significant differences all support the argument that changing Minneapolis middle school start times does not negatively impact Minneapolis middle school students. Of importance is that students in Minneapolis are getting more sleep each night, on average, than students in District B (compare 8 hrs, 42 min to 7 hrs, 25 min).

#### *Further Analyses Relative to High School Students*

The analysis of the student data also investigated the relationships between certain variables, such as the relationship between employment after school and reported grades. There is a statistically significant, although very small, negative correlation between the number of hours worked during the week and self-reported grades. In other words, the more hours worked during the week, the lower the self-reported grades. However, because the correlation is weak and is based on a large sample size, we could not easily predict a student's letter grade

just by knowing the number of hours he/she worked during the school week. There is also a statistically significant, although very small, negative correlation between the number of hours worked during the weekend and self-reported grades.

There is no relationship between participation in sports and letter grades when practice occurs after school or on the weekend; that is, letter grades are not affected positively or negatively if students practice after school or on the weekend. However, a statistically significant, negative correlation exists between practicing before school and letter grades. That is, the more days per week students spend practicing before school, the lower the self-reported grades. An interesting subfinding is that in looking at hours of practice instead of days of practice per week, there was a statistically significant, positive relationship between the numbers of hours of practice on school days and self-reported grades. However, this effect was only found *if practice did not occur before school*. One may speculate that the fewer hours a student has available, the more efficient the student will manage his/her time.

Finally, there is no statistically significant relationship between participation in extracurricular activities other than sports and self-reported letter grades. In other words, letter grades are not affected positively or negatively by participation in extracurricular activities other than sports.

### **Student Attendance and Achievement**

Initial analysis of the student attendance data suggests that there was a very modest improvement in attendance rates at the high schools during the first year after the later start time had been implemented.

Achievement data is currently being compiled. However, it must be noted that any findings will be considered as informational and preliminary, and that conclusions will be drawn only after three years' worth of student achievement data is available and analyzed.

### **Teacher Survey Results**

In the summer of 1998, a one-page questionnaire was sent to every high school teacher in the Minneapolis School District. The survey questions were developed as a result of findings from the focus groups data collected for this study. Out of these approximately 500 teachers, a total of 335 returned their completed surveys to CAREI, for a response rate of 67%. The survey contained both closed- and open-ended questions.

#### *Impact on Student Behavior*

The written survey reveals that 57% of the teachers report a greater number students being more alert during the first two periods of the day than was the case with the earlier start time. In fact, this item generated the most agreement of any question on the survey. Sixteen percent were neutral in their answer, and 27% disagreed. Also, slightly more than half (51%) of the teachers agree/strongly agree that they see fewer students sleeping at their desks. Interestingly, the respondents were evenly divided into thirds (33% agree/strongly agree, 32% neither agree nor disagree, 35% disagree/strongly disagree) with the question, "I see improved student behavior in general."

Teachers are evenly divided in terms of the nature of the comments (positive vs. negative) they have heard from students and from parents regarding the later start time. Of those that neither agree nor disagree, 25% say that they have heard neither positive nor negative comments from students, and 40% say that comment has not been heard from parents. Although practices, extended day programs, and rehearsals were shortened, students still arrived home at a later hour than they did last year, fostering parental concerns about safety and somewhat reducing student participation in after school activities.

Difficulties with students' work schedules were noted by several teachers, who wrote that these teenagers have less time to work or must work later in the day in order to put in as many hours as they were able to previously. The teachers also perceived that there was less involvement in extracurricular activities because of the variety of demands placed on students and the decreased time in which to complete these because of the later school ending time. However findings from the student survey would not substantiate that perception. Finally, several teachers noted that some students now seem more tired at the end of the day, with class extending an hour later into the afternoon.

#### *Impact on Instructional Endeavors*

By a slight majority, teachers reported that the later start enabled students to come to school more rested, and therefore were more ready for learning. The trade-off, however, meant that at the end of the day, some student athletes needed to be excused from their last hour of class to get to an athletic event on time. While fewer than 20% of high school students participate in athletics in any one season, at times there is a perception by teachers that the early dismissal of even a few students is a problem. One teacher wrote, "Now, I lose one-half of my sixth hour IB [International Baccalaureate] class in the fall to sports' start times." The dilemma is being felt by the coaches as well as the classroom teachers, "As a teacher and a coach, I was extremely troubled that I had to excuse my student athletes from class 13 times this spring for track meets.... Many of us [coaches] were very distressed about this situation because it goes against everything we stand for as educators." Still, the majority of the sentiment about students missing class because of sports is summed up in this comment, "Please keep in mind that the primary purpose of schools is to educate, not to run extracurricular sports programs." Clearly, this is a critical issue to resolve if the later starting time is to remain in place to benefit *all* students, and not just those *not involved* in athletics.

During the focus groups with teachers, the respondents noted that fewer students were seeking academic help before and after school. This concern was substantiated by the written survey, where 50% of the teachers disagree/strongly disagree that more students are seeking academic help *before* school and 60% disagree/strongly disagree that more students are seeking academic help *after* school.

Transportation issues and their impact on learning appear to be huge issues in feeling favorable towards the later start. Being in the "second tier" of the Minneapolis district's three-tiered busing schedule means that buses arrive late much more often now. This is usually because of delays that occur during the first run for the elementary schools who have a 7:40 start. One teacher noted, "Tardies are still a problem with the 8:40 start time--with many students late because of late buses. [This is] very frustrating--almost impossible to teach when you have a continuous stream of late students."

Finally, many teachers commented on the positive effect it has had upon their own preparation for the instructional day. Teachers are having faculty or department meetings before school instead of after school and find that they are fresher for thinking through difficult curriculum changes and feel greater energy to be engaged in professional discussions.

### *Impact on the Teachers' Personal Lives*

The professional and personal lives of teachers are unquestionably interdependent, and the findings from the focus groups highlighted the need to ask more definitively about that on the written questionnaire. The question, "I have found that the later start time has had a positive impact on my personal schedule before school" resulted in 51% of the teachers responding agree/strongly agree. Thirty-four percent disagree/strongly disagree, and only 14% were neutral. In contrast, the question, "I have found the later start time has had a positive impact on my personal schedule after school" resulted in 68% of the teachers marking disagree/strongly disagree (with 49% of that total at the strongly disagree level). Sixteen percent were neutral, and 16% agreed/strongly agreed.

Those teachers who experienced a positive personal outcome from the later start cited improved health, more personal family time in the morning, more sleep/more alert in the morning, and time to exercise in the morning before going to work. The fact that they are getting more sleep and are better rested was brought up by 16% of the teachers. One stated, "I did not get more and more exhausted as the year progressed", while another reflected, "I realized in May, that in years past, I've been totally sleep deprived and acted as such!"

The negative outcomes from the later start were a strong theme in the focus groups, and were slightly more prevalent also on the written questionnaire. The most often-mentioned personal reason for disliking the later start time was that it resulted in teachers having to drive in heavier traffic both to and from school. Teachers also reported being more tired at the end of the day than in previous years. The combination of personal obligations and teacher fatigue is perceived by Minneapolis faculty to have decreased teacher supervision of after school activities.

### *Overall View of the High School Changes*

The teachers were asked to respond to the following question: "My feelings, overall, about the later start are..." with the response set of, "Hate it", "Don't like it", "Neutral", "Like it", and "Love it". Only slightly more respondents (45%) felt favorable--Like it/Love it--than unfavorable (44% responded Don't like it/ Hate it) about the change. Only 11% felt neutral. There was a stronger favorable response of "Love it", with 23% giving that response, than there was for the negative "Hate it", with 15% of the total.

Finally, the question was asked about the ideal start time for school. Although 44% of respondents answered the previous question that they either hated or did not like the new start time, it is also clear based on the responses to the question above that very few (3.5%) would choose to return to the previous start time of 7:15 AM. The ideal start time for Minneapolis high schools, according to these teachers, is 8:00 AM. Perhaps most significant is the fact that almost three-quarters of the teachers surveyed (72.7%) chose a start time of 8:00 AM or later.

### **Focus Group Data**

The groups were conducted with teachers, students, and support/administrative staff at three high schools and five middle schools. Administrators from each school solicited volunteers and insured that each grade level was represented. While not specifically controlled for in this study, informal attempts were made to generate a diverse group of participants in terms of gender, ethnicity, and diversity of opinion concerning the start time. Focus groups were also conducted at fourteen elementary schools with only teachers and administrative/support staff. In total, the fifty-four focus groups provided a forum for participants to reflect on the impact of the start time change and to identify areas of greatest concern and relative to the change.

What was clear from the data was that opinions, both positive and negative, were strongly held regarding the impact of changes in school start time. The data suggested that the impact of changes in school start time was highly individualized. A later start was ideal for some families, while the same change in start time was disastrous for others. This held true for teachers and support/administrative staff as well. The impact on students was also seen to be highly individualized. Special needs students were reported to be impacted somewhat differently and more positively than the general school population.

Several consistent patterns of response emerged from the focus group data. The 8:40 start was seen to be the most desirable by far, followed by the 7:40 start. The least desirable and the most problematic start time was 9:40. The 9:40 start for middle school students and some elementary students was particularly problematic in terms of the perceived negative impact upon teaching and learning.

Transportation was seen to be at the heart of many of the problems relative to the current school schedule. Late and unavailable school buses were seen to have a profoundly negative effect on morning classes, field trip opportunities, and after school activities. For many students who are dependent on school transportation, the limited availability of school buses limits their access to the resources of the school.

In only a few schools was it apparent that community services such as parks and recreation, libraries, the YMCA/YWCA, etc., had been fully involved in a plan to transition to the new schedule. The result was that many respondents reported feeling abandoned by the district and the community. Families of students and the families of teachers and support staff often found it difficult to access services such as daycare, recreation, and health care. While some schools put forward a substantial effort to work with the communities and families to assure these services, other schools found themselves at a loss to make these adjustments.

### **Athletics**

Twenty-eight athletic directors and coaches were interviewed from various Minneapolis high schools and middle schools concerning their experiences with the later school start time in relationship to athletics. High school athletics were given more attention than middle school athletics simply because of the large number of organized sports at the high school level, compared to the small number of organized middle school sports. The 18 high school coaches interviewed instructed a total of 43 sports.

About half of the interviewees (13) indicated that the change has been difficult and they have had to do a lot of accommodating, but that they are coping with it. Three others indicated that there have been a few hassles, but that, overall, it has not been a big deal. Three participants indicated that it has been a very bad experience – “horrible” was the word one

coach used. The remaining six participants indicated that there have been pluses and minuses, and of these six, a couple of them said that the change has been positive.

Some of the principle problems that participants raised associated with the later school day were students leaving school early for competitions, shortened practices, lack of facilities to accommodate teams' practices and competitions, less student participation in athletics, and a shortage of buses to take athletic teams to practices and games.

### **Activities**

Co-curricular activities are the before and after school activities that are non-athletic, such as drama, speech, student council, yearbook, computer club, chess club, etc. The student activities director of the Minneapolis Public Schools was interviewed along with 13 co-curricular activities instructors from the middle and senior high schools. The impact of the later school start time on middle and high school co-curricular activities was not significant in a positive or negative way.

Interestingly, the four interviewees who reported that their activities were negatively affected by the later start time also stated that in some ways they liked the new schedule. Two of the four went so far as to say that they want the high school start time to stay the way it is, at 8:40. The other two indicated that they would prefer a start time of 8:00 and 8:15, still significantly later than last year's start time. Although their activities have been impacted in a negative way, they mentioned that the students are more alert, and that they personally like it better than last year's start time. Overall, two-thirds of the high school instructors who were interviewed stated that they prefer to start school at 8:40. The average preferred school start time among all 13 instructors was approximately 8:15.

### **Conclusion**

Although some difficulties have arisen due to the changes in the starting times of schools in the Minneapolis School District, the overall view of the evaluation thus far is that there are clear positives emerging from the first year's data. As adjustments and changes have been made to adapt to a change in a school's starting time, to make further significant changes anytime soon would cause students, teachers, and families to, once again, experience disruption. For that reason, and for the positive effects that have appeared thus far, the words of a teacher responding in writing ring true, "This change has been a long time in coming--please give it a long trial before making a judgment."