CHESS FOR SUCCESS EVALUATION

Final Report

September 2006

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EXECUTIVE SUMMARY

An after-school program, Chess for Success (CFS) provides chess instruction to students who want to learn how to play chess. The primary goal of CFS is to use the game of chess to train and enable children to be patient and analytical in all problem-solving situations so that their academic achievement, as well as self-esteem, will improve. Currently implemented in 61 Title I schools in Portland Public Schools (PPS) in Oregon, the program serves some 2,500 students in elementary and middle grades at a per-student cost of $75.

This report provides information on evaluation activities conducted in the 2004–2005 and 2005–2006 school years. The study was focused on the collection of data on outcome variables, including student behavior, self-esteem, and academic achievement in mathematics and reading. The process of securing approval from PPS and parent consent for participation in the study took longer than anticipated. As a consequence, the data were collected for a smaller sample than expected.

For this evaluation report, student data were collected for 321 students across the two school years. In addition, demographic data, including gender, ethnicity, and English language learner (ELL) status were obtained for the participating and comparison students. The preliminary data indicate that the CFS and comparison students were highly similar with respect to not only demographic characteristics but also the key outcome variables. Thus, the baseline data provide a sound basis for the comparative analyses that was conducted in the second year of the study to assess program impact.

Short Term (Proximal) Student Impact: A telephone interview with coaches revealed that participants exhibited the following short-term program impact:

- Improving students' ability to follow directions, plan ahead, and think about the future

- Improving students' academics, attention/focus, behavior, concentration, confidence (especially in primary grades), convergent/divergent thinking, logical reasoning, patience, problem solving (looking at things more carefully and learning strategies for dealing with different people), and self-esteem

- Teaching commitment, consequences, cooperative behavior, resource management, sportsmanship (shake your opponents' hand, "learn from a loss—it's not the end of the world," "you're not always going to win," "setbacks happen"), and chess (playing better and taking more time looking at the board)

- Providing a safe, happy, comfortable, and social environment

The research suggests that increases in the proximal areas will have a positive long-term affect on assessment scores. The three-year study also looked at (a) Oregon math and reading assessment scores, (b) *Coopersmith Inventory* of student self-esteem, and (c) a project-developed *Student Behavior Rating Scale* between CFS and a comparison group of non-participants.

- The study found a statistically significant difference in the math RIT scores for the participant group compared to the comparison group. An independent t-test was conducted to examine the differences of means between the CFS and comparison students in the fourth grade. A significant difference was detected between the two groups ($t=2.941$, $p<0.05$).

- A comparison of CFS students by state, district, and school was conducted to examine the percentage of students who exceeded, met, and did not meet reading and math benchmarks in 2006. The CFS students (91.7%) had a higher percentage in meeting or exceeding standards in reading in 2006 than the state (86.7%) and district (87.7%) percentages. Moreover, CFS students (93.0%) had a higher percentage in meeting or exceeding standard in math in 2006 than state (88.3%) and district (89.7%) percentages.

- A Coopersmith Inventory School Form was administered to the CFS participants and comparison students in spring 2006 to assess the students' self-esteem. No significant difference was found between the CFS and comparison students.

- The Student Behavior Rating Scale was distributed to the teachers of CFS and comparison students in spring 2006. The teachers were asked to rate their students on school behavior during the current school year. No significant difference was detected between the CFS and comparison students.

Recommendations

This research sheds some light on the effects of Chess for Success program on student's self-esteem, behavior, and academic achievement. The study has raised a number of issues which future work should address.

- The average math RIT score was higher for the CFS groups all three years. This suggests that the CFS program is excellent in engaging high-performing students and keeping them involved in school. The high proportion of girls participating is especially encouraging.

- Continue to study the same cohort of students for a longer period of time so as to assess the long-term effect of the program.

- Continue to improve the implementation fidelity of the program. Across the schools, are all the students in the program receiving the same instruction in playing chess? What are the criteria for the recruitment of coaches?

Despite the work that still needs to be done in this area, this study provides some insights about the impact of Chess for Success program. The project has accomplished its primary goal of training and enabling children to be patient and analytical in all problem-solving situations so that there is an increase in their academic achievement and self-esteem. It is important note that the schools in the study are Title I schools that have students who are the neediest students in terms of academic achievement and level of poverty. The project has also had an impact on increasing the interest of a strong proportion of girls in analytical problem solving, which in turn should increase their participation in mathematics and engineering programs and careers.

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This report on the evaluation of Chess for Success was prepared by a study team consisting of Kim Yap, Angela Roccograndi, and Annie Woo of the Northwest Regional Educational Laboratory.

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INTRODUCTION

In 2004, the Northwest Regional Educational Laboratory (NWREL) received an award from the Office of Juvenile Justice and Delinquency Prevention (OJJDP), U.S. Department of Justice, to conduct an external evaluation of the Chess for Success (CFS) program implemented in Portland Public Schools (PPS). An after-school program, CFS provides chess instruction to any student who wants to learn how to play chess. The primary goal of CFS is to use the game of chess to train and enable children to be patient and analytical in all problem-solving situations so that their academic achievement, as well as their self-esteem, will improve. The evaluation study is intended to assess the extent to which CFS is accomplishing its goals. This report describes evaluation activities conducted during the 2004–2005 and 2005–2006 school years, and its findings.

PROGRAM DESCRIPTION

The program is currently implemented in 61 Title I schools in Portland Public Schools. The average CFS membership consists of 40 students, although at some schools there are as many as 100 members. Currently, some 2,500 students participate in the program. Approximately 30 percent of the participants are girls, an unusually high proportion compared with the average national participation by girls in chess programs.

At each participating school, program activities are managed by a coach, usually a teacher at the school, who receives a stipend of $1,000 a year to provide 50 hours of chess instruction during after-school hours from October through March. Total program cost is $3,000 per school, with an average per-student-cost of $75. Each participant is provided a chess set and other related items, such as T-shirts, rewards, and certificates.

To ensure fidelity of program implementation, CFS provides its coaches with a manual that includes 30 lesson plans designed to assist students in advancing their chess-playing skills. In addition to a three-hour formal training for the coaches at the start of each year, mini workshops are provided during the year to share best practices and to facilitate communication among coaches. A chess library is set up for each school. In addition, CFS program directors closely monitor each participating school and provide technical assistance to coaches on a regular basis. The executive director and program directors meet bi-weekly to review progress and to identify areas needing improvement.

EVALUATION

The study addresses the following questions:

1. How is Chess for Success implemented in the participating schools? What are some facilitating conditions and major barriers to effective implementation?
2. Is the program making a difference for students in academic achievement, self-esteem, and behavior?
3. How does the program make a difference? How can it be further strengthened?

Methodology

The evaluation uses a quasi-experimental design with matched comparison groups. Individual students were used as the unit of analysis to increase the precision of statistical analyses. Data collection was conducted as a collaborative effort among program staff members, Portland Public Schools (PPS) personnel, and the external evaluator.

Independent Variables

While the evaluation study is essentially summative, it examines both program implementation and impact. Two key independent variables are:

- Attendance at chess class, in hours
- Intensity of engagement in class activities

Additional contextual information relating to program implementation was obtained from the coaches in the 2005–2006 school year. Of particular interest were any major barriers to a high-fidelity implementation of the program at particular schools and "procedural knowledge" that the coaches had developed to overcome such implementation barriers.

Instruments were developed by NWREL in the fall 2004. Drafts of the student engagement/attendance form and a coach interview protocol were field tested in three schools in February and March 2005. To make it easier for chess coaches to record attendance and the level of engagement in chess activities, one form was created to record both types of data. These data were to be collected during the 2005–2006 school year.

Dependent Variables

Dependent variables included the following:

- **Academic achievement.** This includes scale scores from the Oregon state assessments in reading and mathematics for grades three and five. The Oregon state assessments are administered annually in the spring.

- **Self-esteem.** The *Coopersmith Inventory* measures personal self-esteem. The short form contains 25 items that students rate as 'like me' or 'unlike me.'
- **Behavior.** NWREL modified an extant instrument provided by Chess for Success that measures student behavior—the *Student Behavior Rating Scale.* Classroom teachers rate students on 17 items on a five-point scale: "Almost Always," "Frequently," "Sometimes," "Occasionally," or "Almost Never."

During the 2004–2005 school year, self-esteem and student behavior data were collected in May and June 2005. Academic achievement results for spring 2005 were available in fall 2005.

School Selection

In the original design, there were 15 elementary schools with 502 students in the sample. This included third-, fourth- and fifth-grade students in the program. The participating schools changed slightly over the course of data collection period. One elementary school dropped out and was replaced by another. To accommodate anticipated attrition, two more schools were added, increasing the potential sample size from 502 to 562 students.

In 2005–2006, some participating elementary school students matriculated to middle schools; participating schools for the 2004–2005 and 2005–2006 school years included:

Arleta Elementary
Astor Elementary
Atkinson Elementary
Beach Elementary
Boise-Eliot Elementary
Bridger Elementary
Chief Joseph Elementary
Creston Elementary
Humboldt Elementary
Kenton Elementary
Lee Elementary
Lewis Elementary
Scott Elementary
Vernon Elementary
Vestal Elementary
Woodlawn Elementary
Woodstock Elementary

Collaborative Efforts with Chess for Success Staff Members

To ensure a successful study, NWREL and CFS staff members worked closely. CFS staff members and the NWREL data collection coordinator met on several occasions between February and May 2006 to review and discuss data collection procedures.

The role of CFS program directors is to visit each of their schools to assist the chess coach and to observe program activities. Since the program directors had established a relationship with these schools, it was decided they would also assist with data collection activities at their schools.

DATA COLLECTION

During the 2005–2006 school year, NWREL was responsible for collecting a variety of data from CFS coaches, students, teachers, and administrators. These data included CFS program implementation data through a coach interview, student attendance and engagement in CFS, the *Coopersmith Inventory* (a measure of self-esteem) from CFS and comparison students, the *Student Behavior Rating Scale* from teachers of CFS and comparison students, and state assessment results in reading and math from CFS and comparison students.

Preparation for Data Collection

Prior to the start of the 2005–2006 school year, evaluation staff members from NWREL met with CFS administrators to strategize the fall start-up of the data collection effort. The group discussed and made decisions regarding: updating the coaches on the components of the study that pertained to them and training them on using the evaluation materials; establishing a process for distributing *Portland Public School Permission to Release Information* and *NWREL Informed Consent to Responding to Surveys* forms to, and collecting them from, students;[1] completing the *Chess for Success Attendance and Engagement Form*; completing a *Chess Academy Survey;* participation in a CFS coach telephone interview; providing incentives for returning completed permission slips and forms; administering the *Coopersmith Inventory* and the *Student Behavior Rating Scale*; and completing a *Report of Data Collection Activities*. (Evaluation instruments and instructions can be found in the Appendix.)

At that time, NWREL evaluation and CFS staff members anticipated the study activities unfolding as follows:

- In early September, CFS coaches hold open enrollment for CFS, as usual.
- In late September, CFS coaches attend the annual CFS orientation that includes a study-related training for coaches in the study schools.

[1] This process was hampered because between spring and fall 2005 one PPS school participating in the study closed and PPS adjusted the flow of elementary school students into their respective middle schools and increased some elementary schools to serve sixth-grade students. As a result, some of the students who, in spring 2005, were identified to participate in the study at a given school were actually no longer enrolled there in fall 2005. As NWREL had no access to student records, there was a lot of confusion regarding where the students were actually enrolled. It was not until after the PPS enrollment period was officially closed, and in early December, that NWREL received an updated list with the current schools of *study-enrolled CFS and comparison students* to help clarify the confusion. NWREL never received a list of the schools where comparison students were enrolled who had been identified in spring 2005 but who had not yet submitted signed, study-related permission slips.

Immediately following the training:

- CFS coaches receive, by mail, a packet of study materials including letters to parents[2] (explaining the study and informing them of an incentive for returning completed permission slips), study-related permission slips, and the first week's *Chess for Success Attendance and Engagement Form* (to be completed weekly).
- CFS coaches receive, by e-mail from PPS, a list of CFS and comparison students identified to participate in the study during the 2004–2005 school year but who have not yet returned completed permission slips to NWREL; CFS coaches are asked to distribute study-related permission slips to these students and to their new third-grade participants.
- CFS coaches forward a class list of their third-grade participants to their CFS director.
- CFS coaches forward lists of third-grade participants to NWREL and NWREL forwards them to PPS; PPS matches the new third-grade CFS students with non-CFS comparison students.
- In early October, CFS coaches receive, by e-mail from PPS, the new list of selected third-grade comparison students; CFS coaches distribute study-related permission slips to these students.
- By late October, all of the signed, study-related permission slips are forwarded to NWREL and then to PPS.
- By early November, NWREL receives the student identification numbers of all CFS study participants in order to prepare the forms for administration.
- November 7–18, 2005 is set as the original pretest window.
- During winter 2006, coaches participate in a telephone interview.
- March 14–24 and April 3–7, 2006 is set as the original posttest window.
- In summer 2006, PPS provides NWREL with state assessment results in reading and math.

As envisioned, in late September the CFS orientation and CFS-study-related training was held with half of the coaches from study schools in attendance. As a result, a second training was scheduled for early October to accommodate those coaches that had not attended previously[3]. The training sessions reviewed: a) the study design, b) coach responsibilities for their receipt of a stipend in the spring, c) the purpose and process for distributing and collecting *Portland Public School Permission to Release Information* and *NWREL Informed Consent to Responding to Surveys* forms, d) the weekly completion of the *Chess for Success Attendance and Engagement Form*, e) participation in the telephone interview, and f) completion of the *Chess Academy Survey.*

[2] Letters were sent in English, only.

[3] Seven CFS coaches never attended the training sessions. In two study schools, the CFS coach positions were vacant at the beginning of the 2005–2006 school year. A new coach was not identified for one of the schools until November, and a second was not identified until the middle of December, just prior to the start of winter break. This second school was eliminated from the study. Efforts were made to speak individually with each of the coaches who had not attended training. Some phone calls were returned, others were not.

At the trainings it was determined that, realistically, the established timeline could not be adhered to—some coaches did not have an open-enrollment that would end at the end of September and many clubs did not start organizing until after that date. Weekly, throughout the month of October, CFS coaches were mailed and e-mailed a customized *Chess for Success Attendance and Engagement* form and requests to submit their third-grade lists to their CFS director. In an effort to increase cooperation within the study schools, NWREL mailed a Chess for Success study informational letter to the principals in all of the participating schools in mid-October.

By early November the majority of the CFS coaches still had not submitted a third-grade student participant list to their CFS director or NWREL, and few had submitted signed, study-related permission slips. The former was necessary in order identify comparison students to match the new third-grade students participating in CFS. The latter were necessary in order to administer the *Coopersmith Inventory*. A second meeting with NWREL evaluation and CFS staff members was scheduled to strategize increased participation in the study. The outcome of the meeting was fourfold:

- First, a November 15th deadline was established for coaches to submit their third-grade list to NWREL; on November 17th, the lists were forwarded to PPS; on November 28th, coaches received a second mailing of study materials, complete with parent letters and permission slips; on December 2nd, the CFS coaches received, by e-mail from PPS, the list of comparison students matched to the new third-grade CFS participants; and the CFS coaches were asked to distribute study-related parent letters and permission slips to these students before winter break.
- Second, the study design was altered. Students who were enrolled in the study during the 2004–2005 school year would participate in a pretest (spring 2005)/posttest (spring 2006) design, and students who were enrolled in the study during the 2005–2006 school year would participate in a posttest-only (spring 2006) design. This change allotted coaches more time to recruit CFS and comparison students into the study (by getting signed, study-related permission slips.) Because data analyses from the previous year indicated that the matching process was working (CFS and comparison students were found to be equivalent at pretest in spring 2005), it was assumed that since the same matching process was used in fall 2006, students again would be equivalent and that a posttest-only design would therefore detect change due to participation.
- Third, the pretest window established for November 2005 was changed to a posttest window established for March 2006.
- Fourth, the deadline for submitting signed, study-related permission slips was set for February 10, 2006.

In December 2005, PPS sent NWREL an updated list of CFS and comparison students enrolled in the study that included students' current schools of enrollment. Using this information, NWREL's database was brought up-to-date. In January, after the students returned from winter break, a final push for getting students enrolled in the study occurred. CFS coaches received a third set of materials, including a detailed summary of students for

whom permission slips had either been received or not received, and additional study-related permission slips to distribute to the students who were eligible to participate in the study, but still had not yet returned completed forms.

By February 17, 2006, a week after the deadline for coaches to submit signed, student-related permissions slips, NWREL had received 262 signed permission slips (183 CFS students and 79 comparison students) from participating schools. Copies of all permission slips received during the 2005–2006 school year were forwarded to PPS and arrangements were made for the delivery of state assessment results in reading and math, (tentatively scheduled for mid-June).

Administration of the *Coopersmith Inventory* and *Student Behavior Rating Scale*

At the end of January, CFS directors were asked to begin making arrangements with the principals in their assigned schools to administer the *Coopersmith Inventory* to a group of CFS and non-CFS students enrolled in the study, and the *Student Behavior Rating Scale* to the teachers of these same students. At the end of February, materials were prepared for distribution and mailed to CFS directors for administering the forms in the schools. Each director received a separate envelope for each school to which they were assigned. Each envelope included:

- A list of students enrolled in the study
- Guidelines for administering the *Coopersmith Inventory* and *Student Behavior Rating Scale* forms
- Director's Data Collection Report[4] for *Coopersmith Inventory* form
- Prepared *Coopersmith Inventory* forms
- Director's Data Collection Report for *Student Behavior Rating Scale* form
- Prepared *Student Behavior Rating Scale* forms
- Enough sharpened pencils for each of the students and teachers to use to complete the form
- Chess Academy Survey (to be administered by the director to the coach if the coach had not completed the telephone interview)

CFS directors were asked to administer the forms beginning on March 13 through April 7, 2006. Through May 8th, NWREL staff members followed up with the CFS directors to ensure the most timely and complete administration and submission of forms as possible.

Coopersmith Inventory. While the form administration window was March 13 to April 7, 2006 (with PPS on spring break from March 27th to 31st), forms were actually administered between March 14 to and May 2, 2006. Forms were administered in four schools after the April 7th deadline. The most common location for administration of the forms was in the

[4] Directors were asked to complete a report after each administration of the survey to document the setting and any problems or concerns that might have arisen during the session.

school library; but forms were also administered in cafeterias, portables, classrooms, and conference rooms. Forms were administered throughout the school day, with the earliest administration at 8:30 a.m. and the latest administration at 3:30 p.m. On average, form administration lasted 18 minutes. In most cases, groups of CFS and comparison students completed the form at the same time.

Of the 25 statements on the form, students had questions about 13 of them. The statement about which students were most unclear was "I often get discouraged at school," with students not understanding what "discouraged" meant. Two other statements were also problematic for students: "My parents usually consider my feelings" and "I have a low opinion of myself."

A few directors indicated problems associated with administration of the form, including the location being noisy or crowded. One director indicated that in the future, an extra copy of the form should be included from which the administrator could read. NWREL received a total of 247 completed *Coopersmith Inventory* forms. Completed forms were returned from all schools except three (two of which had no study or comparison students attending in 2005–2006). In most cases all of the completed forms that were expected were returned; in three schools, one of the expected forms was missing.

Student Behavior Rating Scale. Again, while the form administration window was March 13 to April 7, forms were administered between March 20 and May 20, 2006. Forms were administered in five schools after the April 7th deadline. In most cases, the forms were distributed to individual teachers by the CFS director or coach, school principal, or office staff members. These forms were then returned to the school office and were picked up by the director and/or mailed to NWREL. In two schools, the teachers completed the forms in a group format. NWREL received a total of 242 completed *Student Behavior Rating Scale* forms. Completed forms were returned from all schools except three (two of which had no study or comparison students attending in 2005–2006). In most cases, all of the completed forms that were expected were returned; in three schools, one of the expected forms was missing.

Collection of CFS Attendance and Engagement Data

The original study design envisioned the collection of attendance and engagement data for all CFS study students for the six-month period in which CFS operated. In reality, CFS coaches collected attendance data (once a week) on *all* CFS students, and collected engagement data on study students *only after* they were enrolled in the study. This occurred to ease the burden of data collection on the coaches, who were informed at the CFS orientation that they were newly required to report attendance data to CFS administrators. To accommodate a request from the coaches, the *Chess for Success Attendance and Engagement Form* was revised, with the top section reflecting the attendance and engagement data for CFS students enrolled in the study (those with signed, study-related permission slips on file at NWREL) and the bottom section reflecting the attendance data for non-eligible CFS students (new CFS participants in kindergarten and first, second, fourth, fifth, and sixth grades) and study-

eligible students (returning CFS participants in fourth, fifth, and sixth grades, and new CFS participants in third grade who had not yet submitted signed, study-related permission slips to NWREL). As signed, study-related permission slips were returned to NWREL, names of students who were listed on the bottom half of the form were moved to the top half of the form and their engagement as well as their attendance was recorded. The complete collection of engagement data was further compounded by the fact that students could now be enrolled in the study through February 10, 2006.

The revised *Chess for Success Attendance and Engagement Form* was mailed as a hard copy and e-mailed as an Excel file to the coaches weekly, beginning in October 2005 and ending the third week of March 2006. As completed forms and permission slips were submitted to NWREL, NWREL staff members entered the data into a database and updated each school's student attendance and engagement form—students with newly submitted permission slips were moved to the top section of the form, new students to CFS were added to the bottom of the form, and any student no longer participating in CFS (dropped or moved[5]) was removed from the form. CFS coaches also received a weekly memo reminding them of any activities or deadlines that were approaching.

By the end of the data collection period (March 24, 2006), NWREL had not received a completed *Chess for Success Attendance and Engagement Form* from four coaches. A fifth coach had no students participating in the study and therefore did not submit forms either. Of the 15 schools from whom data were submitted, NWREL received attendance and engagement data for 23 weeks beginning October 10, 2005 and ending March 23, 2006.

CFS Coach Interview

In the January 20th mailing to CFS coaches, NWREL evaluation staff enclosed a faxable form for coaches to use to schedule the telephone interview. CFS coaches were asked to submit several days and times at which they could be telephoned to complete the interview. As these faxed forms were received at NWREL, the interview was scheduled, the CFS coach was notified, and ultimately the interview was conducted. Between the aforementioned mailing and the March 17th mailing, CFS coaches were reminded to submit the fax to participate in the interview. In mid-February 2006, the first of 10 telephone interviews was conducted. Nine coaches did not respond to the requests to participate. One coach was exempted from participating, as no study students were enrolled in the program in his school. (See Appendix for a copy of the interview protocol.)

Program Observation

In March 2006, NWREL evaluation staff members attended a sampling of CFS clubs to observe the program in action. Criteria for selecting clubs included club meeting time and location and the availability of evaluation staff members. A total of eight clubs were visited.

[5] These students accounted for 28.6 percent of the students for whom NWREL had signed, study-related permission slips.

Communication between NWREL and CFS

NWREL maintained weekly communication with CFS staff members. Every *Chess for Success Attendance and Engagement Form* received by NWREL was copied and forwarded to CFS. Weekly, by mail or e-mail, a "Summary of Data Received to Date" was sent to the CFS directors. This report summarized what data had been received from each school (i.e., permission slips, *Chess for Success Attendance and Engagement Form*, CFS coach interview, student and teacher forms). In addition, any memo sent to the CFS coaches was also sent to the CFS directors. CFS directors were also sent a memo in late January asking them to follow up on several issues with the CFS coaches, including the distribution of study-related permission slips to the newly identified third-grade comparison students and study-eligible CFS students who had not yet returned signed slips. As noted elsewhere, when appropriate, scheduled meetings were also held to discuss issues. As needed, telephone calls were placed and returned.

Changes in CFS Staffing

A CFS director retired mid-year. This director was replaced by two directors, one of whom resigned in the middle of the form administration window.

CFS Implementation

In the winter of 2006, Chess for Success coaches in the Chess for Success study schools were asked to participate in a brief telephone interview regarding implementation of the program in their schools. Ten coaches completed the interview, from the following schools: Astor, Beach, Bridger, Humboldt, Kellogg, Lee, Scott, Vernon, Vestal, and Woodstock. Coaches were asked about their meeting format; instructional content; support they received; and implementation highlights, challenges and impacts. The following section summarizes their responses.

Meeting Format

Chess for Success sessions are designed to be one hour in length, with the first 15 minutes devoted to instruction. In general, coaches reported that the 15/45 minute format worked well in their school. Instruction for the first 15 minutes was an appropriate amount of time and was followed by 45 minutes of time to practice that content. Coaches noted the following: younger players tended to get bored if the instructional component went beyond 15 minutes or if the club actually ran for an hour. One coach added that the 15/45 minute format worked better with the older students (who, ironically, did not always require instruction).

Several coaches responded that that they did not follow this format. Two coaches noted that they used this format for the first couple of months and then allowed students to use the whole session for playing chess, addressing issues that arose as needed. One coach used the instructional time to allow students to enjoy an after-school snack prior to playing at the chess boards.

Clubs' schedules varied. Several clubs met two days a week for an hour (with some players attending both days and some players attending one); several clubs met one day a week for one hour, and several met one day a week for more than an hour. One club had a set schedule, meeting two days a week for an hour; however, membership varied depending on the time of year——third-, fourth-, and fifth-grade students played in the fall through December, at which time the Chess Team was selected; the Chess Team played in the winter; in the early spring the Chess Academy (kindergarten, first- and second-grade students) played, followed by the primary team that played from mid-May through the end of the year. In one school, beginners met on two days, and experienced players met two different days. In January, the groups merged, playing one day a week together and one day a week apart. At the end of the year they played together two days a week.

Instructional Content

Chess for Success provides each coach with a chess manual—Portland Chess Project Lesson Plans—by the Oregon Scholastic Chess Foundation. The manual contains chapters that address: an introduction, teaching procedure, ethics of scholastic chess, characteristics of a good chess club advisor, the OMSI/OSCF Chess Tournament, where to go for more information, and 30 individual lessons that start with "How to Begin" and end with "Further Principles of Development."

The majority of coaches reported using the teacher manual, but more often when they first started coaching rather than later. For a new coach, the manual was reportedly useful for learning how to teach the pieces, learning the order for teaching the pieces, format and layout, and teaching notation and techniques. One coach reported that as a new coach, it was necessary to augment the manual because it did not explain enough. Experienced coaches who reported referring to the manual, did so for reference. Furthermore, interviewees noted that the manual was more useful for the elementary-school clubs than for middle- or high-school clubs because the players were usually already familiar with that level of content. Regardless of its use, much of the content that coaches indicated covering in the 15-minute instructional period coincided with many of the chapters in the manual.

Coaches made a number of suggestions—streamline and simplify the manual (especially for new chess players) and include: moves from classic chess games; advanced chess theory and tactics; tips for new players to remember moves; problems that enable the students to see options, because "if they can't see them they can't do them;" and advanced lessons for experienced players/coaches. One coach reported not being familiar with the manual.

In addition to building on their own experiences, coaches reported using other materials that included: "Winning Chess Piece by Piece" (includes helpful mazes, exercises to learn how the pieces move, and sample games); chess lessons, downloaded from the Internet; "Mensa Guide to Chess;" "Complete Chess Book for Beginners;" "Chess for Dummies;" "Chess: 5334 Problems, Combos, and Games;" and a variety of chess books that teach strategies, including obtaining checkmate in a certain number of moves, the English opening, and the French Indian defense.

Coach Support

Support to coaches and their clubs primarily came from the CFS executive director, who oversaw all of the clubs in Portland, Monmouth, and Beaverton, and from the program directors who were assigned to visit a group of schools. The majority of coaches reported that the CFS executive director provided them with a variety of supports to assist their clubs. These supports included in-services, materials (chess sets, boards, display boards), t-shirts, tournament registration, and being available to answer questions. Several coaches reported not necessarily needing to ask the CFS executive director for anything; however, if they needed something, they knew who to ask and thought it would be provided. One coach suggested the addition of a section to the Web site for coaches' access that would provide them answers to frequently asked questions and "a chain of command—who to go to, for what."

In regard to the in-services provided by the CFS office, reviews were mixed. Not all of the coaches interviewed participated in this year's training—the fall orientation. A few coaches were vague, reporting that orientations were somewhat helpful or that "it is nice to get together as a group and hear about what is going on." These coaches did not necessarily feel as though the trainings could be or should be improved. Coaches who could not attend the orientation had schedule conflicts, and many noted that it was difficult to get everyone together at one time. Coaches did like attending meetings where they would come away with one or more tips, hints, or "aha's" to improve their program. Coaches talked about sharing and receiving sample tournament forms; getting ideas for tracking attendance, keeping lanes open, ranking players, and taking notes; and learning about "knights off-side." Several coaches noted that it was nice when people came prepared with handouts to share; they commented that it was helpful to know what other coaches were struggling with, so that if they could help, those coaches would come away with answers to their challenges. The best advice one coach got was reported as follows:

> *The most I gained was the philosophy espoused at a coaches' dinner a while back, that chess should be fun for kids to get them to concentrate. Winning is not the most important thing. Losing is as valuable a learning experience as is a win.*

Two coaches suggested summer workshops. One suggestion was for coaches to register for a brief but specific period of time (i.e., Tuesdays evenings from 7:00 to 9:00 for six weeks) and learn strategies to use with advanced students. The second was for summer chess camps for

both the students and the coaches to attend. This opportunity would allow coaches to observe other coaches interact with their students, and would give coaches time to interact with each other and share tips—ultimately "re-energizing the system."

All coaches' indicated that the program directors visited their clubs while they were in session. While the frequency of visits differed from one coach to the next (ranging from twice this year to every other week), there was no indication that such visits were not frequent enough, but rather "sufficient" or "as needed." Coaches reported that program directors generally asked them if they needed anything and did whatever was asked of them, including: observing their chess clubs; asking players questions/about strategies; playing with the students (allowing students the opportunity to play with an adult or a more experienced player); teaching lessons; providing materials (new chess sets, clocks, pocket display boards); suggesting books and instructional ideas (pawn wars, circular chess boards); and sharing recommendations from other clubs; and registering students for and organizing chess tournaments.

Implementation Highlights

The majority of the coaches responded that various aspects of their clubs were going especially well. Several coaches saw their club's membership as a positive feature. One coach commented that the number of students in the club was both a blessing and a curse. The space they played in was not a prime spot for chess when you had a large number of players (poor acoustics and other simultaneous activities); it would have been better if there had been fewer of them. However, the positive side was that chess was such an integral part of the school and that there was no way to limit the number of players. Another coach commented that their club served a large number of students as well, without any outside help and continuing year long. Finally two coaches commented that they had a large number of girls participating in their clubs.

Several coaches commented that their players were making it to regional or state tournaments, that their students enjoyed competing in that venue, and that some of their players had good records. Other coaches commented that their clubs/schools had really developed a sense of team or pride in having a club. In one school, where there were not enough players at a grade level to have a full team for regionals, the players decided not to compete because emotionally they knew they did not have a "team," and it was the team aspect of competing at regionals that they enjoyed. In a second school, chess had become a real part of the school culture. The coach commented, "Students take pride and have a sense of accomplishment. Over half of the student body has Chess for Success t-shirts, and they wear them with pride."

Several coaches appreciated that they had help from parents or other "dedicated volunteers." Some reported that the students had settled down in behavior and could now "sit and concentrate." A few coaches responded that the kids were committed and really enjoyed playing chess: "There are a core group of participants that are happy, safe, socializing, and

committed." Finally one coach was happy that their club "sets up, runs smoothly, and is highly organized."

Implementation Challenges

Several coaches thought their programs were strong and that they faced no challenges or needed no additional supports. On the other hand, some coaches pointed out several challenges, including: their own lack of experience/training in dealing with discipline issues; student discipline; competition with other activities (basketball); finding adults to play with the students; membership (the significant decrease in the number of kids playing chess); players with unreasonable expectations and/or who did not know how to deal with losing; dismissal (getting everyone picked up at the end of the day on time); establishing routines (attendance, setting up/dismantling boards); meeting the expectations of the school membership who value chess; and time for tournaments.

Coaches offered suggestions for additional support. Several coaches thought their programs could benefit from additional help—not necessarily volunteer help, but consistent support from a teacher or someone else with experience dealing with students. One coach asked for "an extra adult body/capable player to play with the kids." One coach thought that the regional tournament should be pushed back closer to spring break: "It [the regional tournament] is the climax of the year." Another thought it would be nice to have "some format for 'homework' for kids to practice playing/working on strategies—some kind of set-up chess situations they can take home." A third coach liked the idea of a chess academy, and another thought that having two teams (dividing the group) would be an improvement, although meeting two times a week would be difficult.

Program Impact

Coaches agreed that the program was having a positive impact on their students. Participation was:

- Improving students' ability to follow directions, plan ahead, and think about the future.
- Improving students' academics, attention/focus, behavior, concentration, confidence (especially in primary grades), convergent/divergent thinking, logical reasoning, patience, problem solving (looking at things more carefully and learning strategies for dealing with different people), and self-esteem.
- Teaching commitment, consequences, cooperative behavior, resource management, sportsmanship (shake your opponents' hand, "learn from a loss—it's not the end of the world," "you're not always going to win," "setbacks happen") and chess (playing better and taking more time looking at the board).
- Providing a safe, happy, comfortable, social environment.

Coach's comments included:

> *It gives kids who struggle an opportunity to feel good, especially if they win—these kids are low SES; it gives them a sense of belonging and pride.*
>
> *I have 55 kids in a small space. The tables are packed. It would be easier to weed them out, but the kids that come are the ones who really need it…and they blossom into players who can actually sit and play a whole game.*
>
> *A SPED teacher saw her student [playing chess] sit still for longer than five minutes. She started crying.*
>
> *Focus—students sit and play chess when they won't sit still anywhere else.*

DATA ANALYSES AND FINDINGS

Participation

Participation by Group

A total of 321 consent forms were returned from the participant and comparison groups. About 233 students (72.6%) are participants in the Chess for Success program and 88 students (27.4%) are from the comparison group (Table 1 and Figure 1).

Table 1
Participation by Group

	Percent	Number
Chess For Success (CFS)	72.6%	233
Comparison Group	27.4%	88
All Participants	100%	321

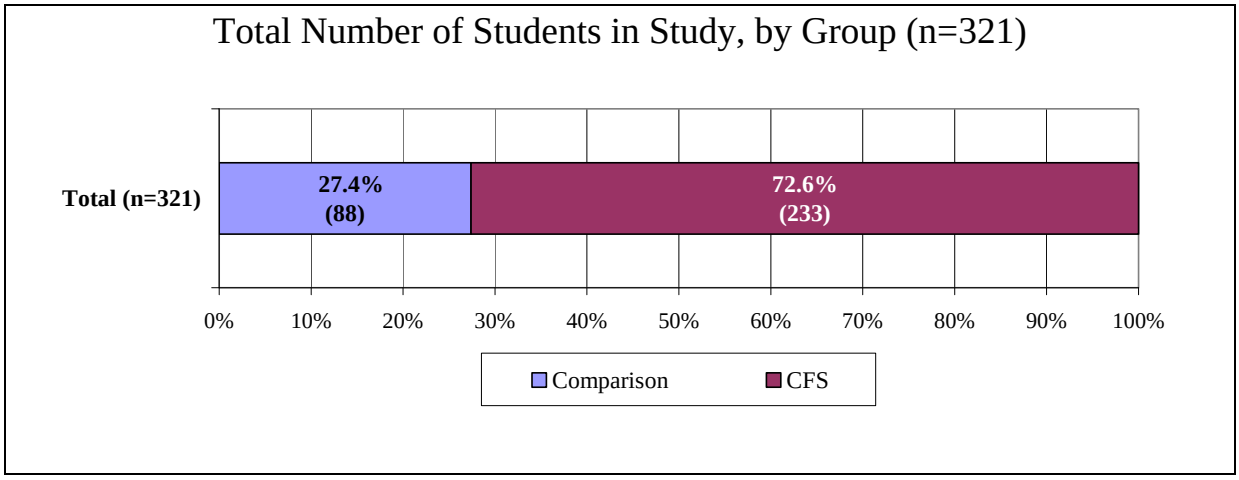

Figure 1. Total Number of Students in Study

Participant Enrollment

The participation of participant enrollment by school and by group is presented in Table 2 and in Figures 2 and 3. Among all participants, students from Atkinson (11.5%), Woodstock (14.3%), and Beach (10.0%) had the highest rate of participation.

Table 2
Participant Enrollment, by School

School	All Participants		CFS		Comparison Group	
	Percent	Frequency	Percent	Frequency	Percent	Frequency
Arleta	1.9%	6	.9%	2	4.5%	4
Astor	6.5%	21	6.0%	14	8.0%	7
Atkinson	11.5%	37	10.3%	24	14.8%	13
Beach	10.0%	32	7.3%	17	17.0%	15
Boise-Eliot	4.4%	14	5.6%	13	1.1%	1
Bridger	8.7%	28	9.9%	23	5.7%	5
Chief Joseph	6.9%	22	8.2%	19	3.4%	3
Creston	.9%	3	1.3%	3	0.0%	0
Humboldt	3.1%	10	3.9%	9	1.1%	1
Kenton	3.7%	12	3.9%	9	3.4%	3
Lee	5.6%	18	4.7%	11	8.0%	7
Lewis	4.0%	13	5.6%	13	0	0
Scott	3.4%	11	3.0%	7	4.5%	4
Vernon	4.4%	14	5.2%	12	2.3%	2
Vestal	6.9%	22	5.6%	13	10.2%	9
Woodlawn	3.7%	12	3.9%	9	3.4%	3
Woodstock	14.3%	46	15.0%	35	12.5%	11
TOTAL	**100.0%**	**321**	**100.0%**	**233**	**100.0%**	**88**

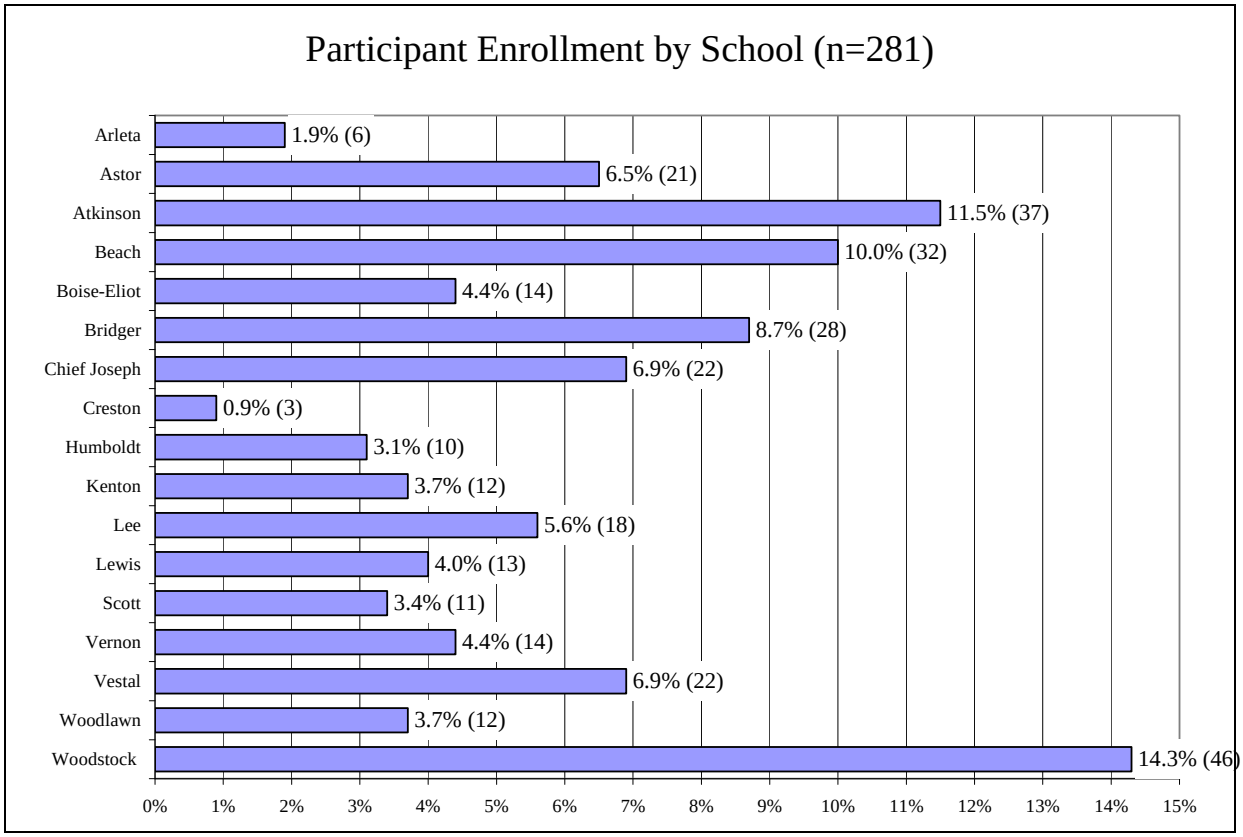

Figure 2. Participant Enrollment, by School

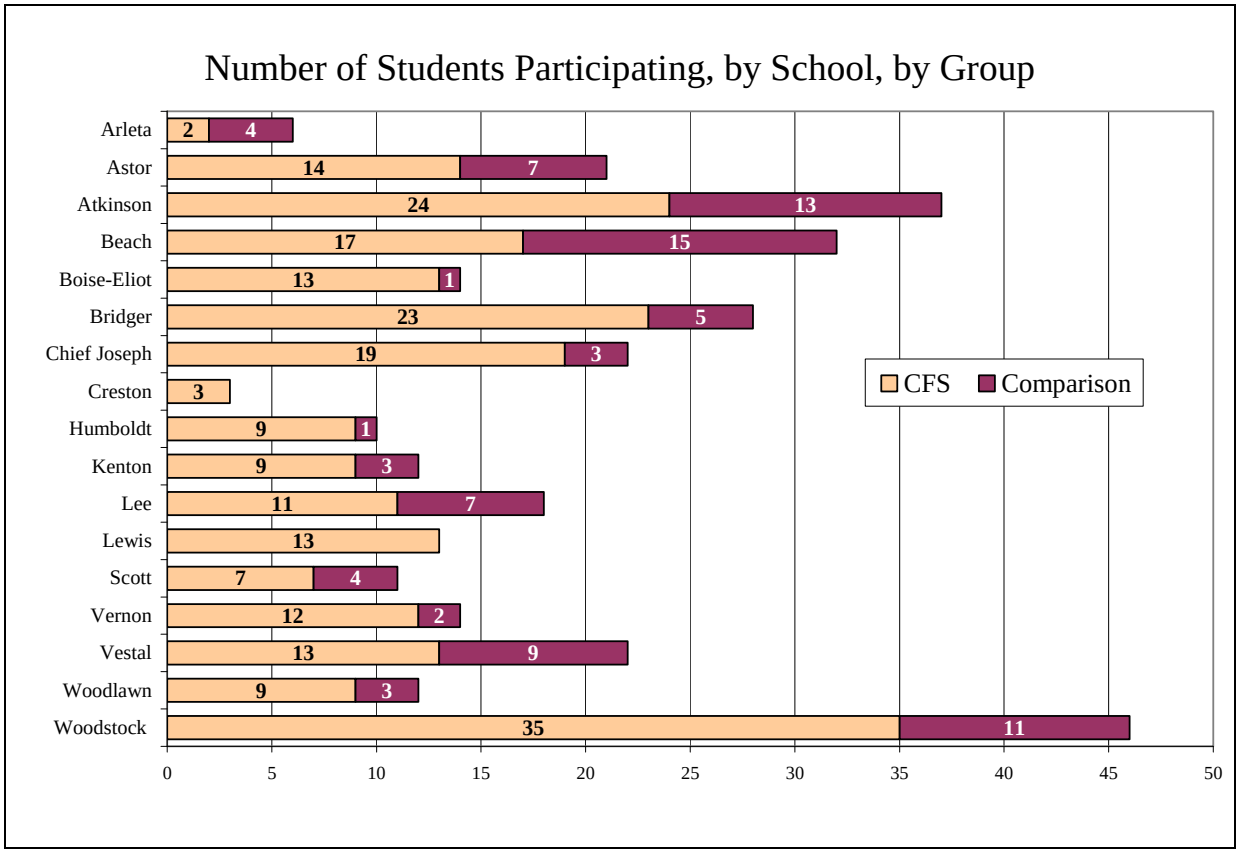

Figure 3. Number of Students Participating, by School, by Group

Demographics

Gender

This analysis included 205 (63.9%) male and 116 (36.1%) female students. The percent of male and female student participants in the CFS program and in the comparison group were similar (Figure 4).

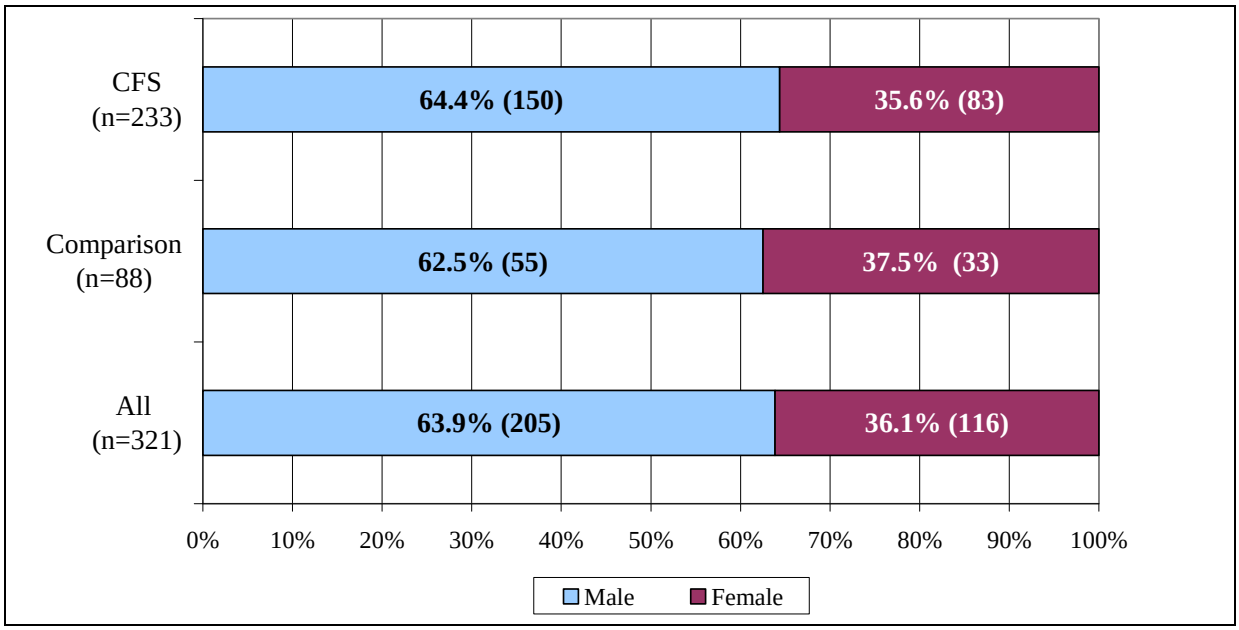

Figure 4. Gender Distribution of Students in the Study Sample

Grade Level

Within the CFS group, 60.1 percent were third-graders, 28.8 percent were fourth-graders, and 11.2 percent were fifth-graders. Within the comparison group, 54.5 percent were third-graders, 36.4 percent were fourth-graders, and 9.1 percent were fifth-graders (Figure 5).

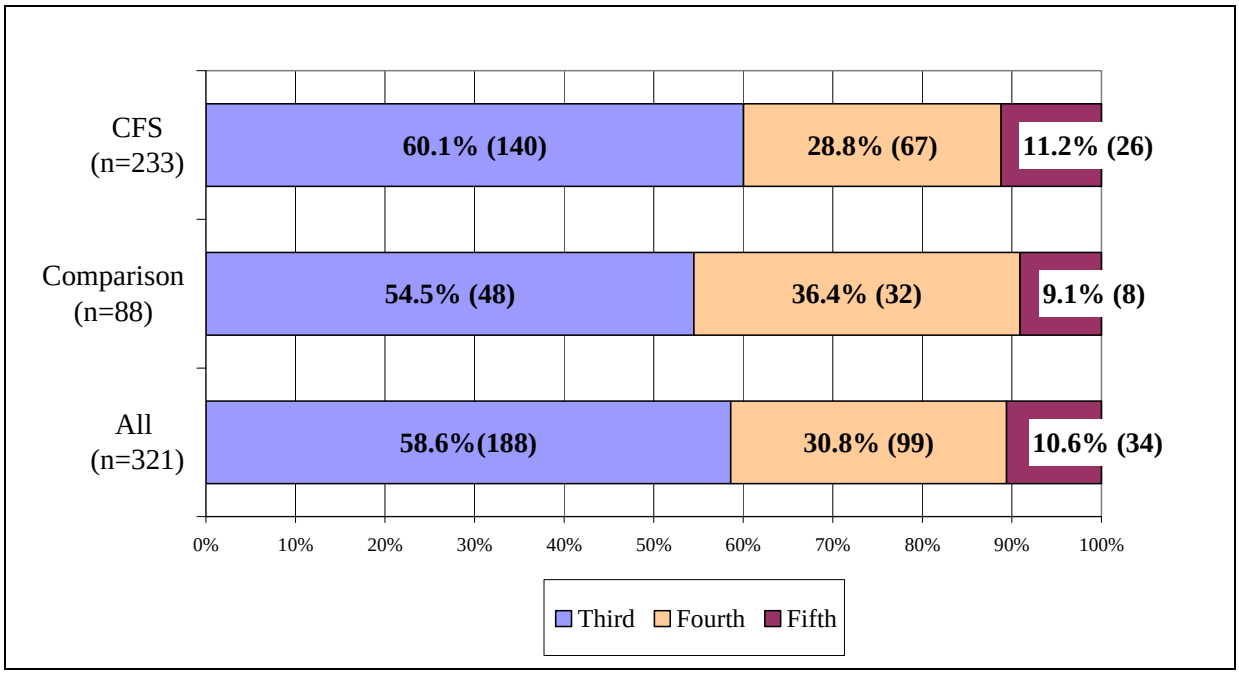

Figure 5. Grade Levels of Students in the Study Sample

Ethnicity

Of the sample students, about half were Caucasian (52.6%), 14.3 percent were Hispanic, 15.0 percent were African American, 16.2 percent were Asian/Pacific Islanders, and 1.9 percent Native Americans. Among the CFS participants, about 51.9 percent were Caucasians, 13.7 percent were Hispanic, 16.3 percent were African American, 16.3 percent were Asian/Pacific Islanders, and 1.7 percent were Native Americans. Of the comparison group, about 54.5 percent were Caucasians, 15.9 percent were Hispanic, 11.4 percent were African American, 15.9 percent were Asian/Pacific Islanders, and 2.3 percent were Native Americans (Figure 6).

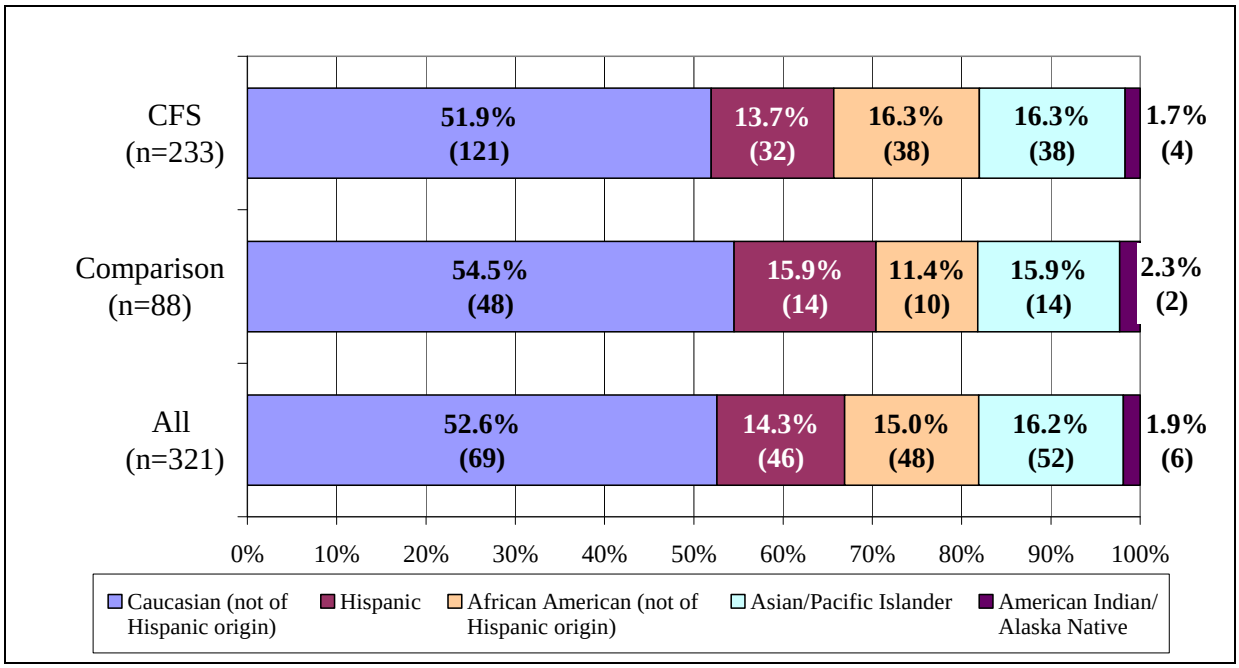

Figure 6. Ethnicity of Students in the Study Sample

English Language Learner (ELL) Status

Of all the students in the study sample, 7.8 percent were ELL students. A breakdown shows that 6.4 percent of the program students were ELL and 11.4 percent of the comparison group were ELL (Figure 7).

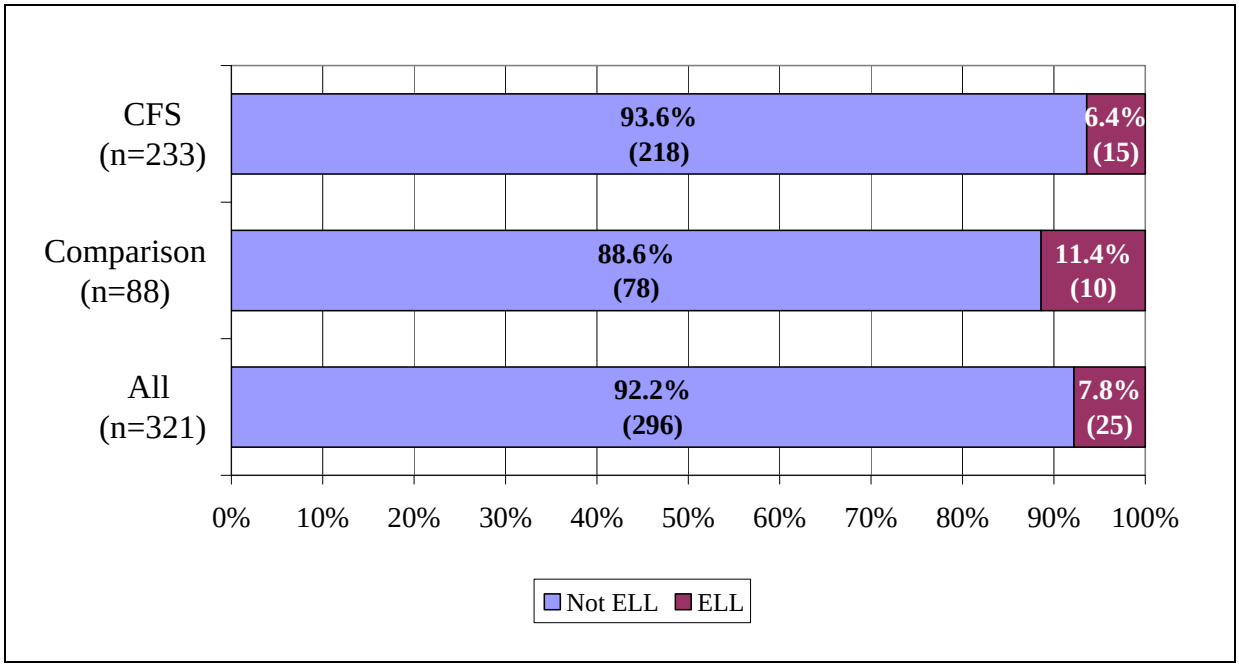

Figure 7. English Language Learner (ELL) Status of Students in the Study Sample

Self Esteem and Student Behavior

Coopersmith Inventory

A *Coopersmith Inventory School Form* was administered to the CFS participants and comparison students in spring 2006 to assess the students' self-esteem. A total score was developed for the inventory. The negatively-worded items were recoded to reflect a positive trend. An independent t-test was conducted to examine the differences of means of the total score between the CFS and comparison students (Table 3). No significant difference was found between the CFS and comparison students ($t = 0.865$, $p > 0.05$).

An independent t-test was conducted on each individual item in the Coopersmith Inventory (Table 4). Significant differences were found on the following items:

- My parents usually consider my feelings.
- I usually feel as if my parents are pushing me.

The descriptive statistics are summarized in Tables 5 and 6.

Table 3
Comparison of *Coopersmith Inventory*
Total Scores of CFS and Comparison Students, 2006

Group	Mean	s.d.	t	df	Sig.
Chess for Success	16.73	4.25	0.865	209	0.388
Comparison	17.26	4.15			

Table 4
***Coopersmith Inventory* Survey Results, by Item**
t-test

TRAIT	Group	Mean	s.d.	t	df	Sig. (2-tailed)
1. Things usually don't bother me.	CFS	0.65	0.477	.281	231	.779
	Comparison	0.64	0.485			
2. I find it very hard to talk in front of the class.	CFS	0.40	0.491	-.579	233	.563
	Comparison	0.44	0.500			
3. There are lots of things about myself I'd change if I could.	CFS	0.47	0.501	.751	231	.454
	Comparison	0.42	0.497			
4. I can make up my mind without too much trouble.	CFS	0.71	0.454	.153	232	.879
	Comparison	0.70	0.460			
5. I'm a lot of fun to be with.	CFS	0.89	0.309	.010	233	.992
	Comparison	0.89	0.311			
6. I get upset easily at home.	CFS	0.35	0.478	-.419	232	.675
	Comparison	0.38	0.488			
7. It takes me a long time to get used to anything new.	CFS	0.30	0.458	-.507	230	.613
	Comparison	0.33	0.473			
8. I'm popular with kids my own age.	CFS	0.63	0.485	.500	231	.617
	Comparison	0.59	0.494			
9. My parents usually consider my feelings.	CFS	0.83	0.377	1.956	232	.052*
	Comparison	0.72	0.452			
10. I give in easily.	CFS	0.22	0.412	-.476	230	.635
	Comparison	0.24	0.432			
11. My parents expect too much of me.	CFS	0.34	0.474	-.535	233	.593
	Comparison	0.37	0.487			
12. It's pretty tough to be me.	CFS	0.52	0.501	1.571	231	.118
	Comparison	0.41	0.494			
13. Things are all mixed up in my life.	CFS	0.41	0.493	1.270	233	.206
	Comparison	0.32	0.470			
14. Kids usually follow my ideas.	CFS	0.54	0.500	.538	230	.591
	Comparison	0.50	0.503			
15. I have a low opinion of myself.	CFS	0.23	0.424	.746	231	.457
	Comparison	0.19	0.394			
16. There are many times when I'd like to leave home.	CFS	0.42	0.494	.924	231	.356
	Comparison	0.35	0.481			
17. I often feel upset in school.	CFS	0.28	0.453	1.383	231	.168
	Comparison	0.20	0.403			

* Significant at p=<0.05

Table 4 (continued)
***Coopersmith Inventory* Survey Results**
t-test

TRAIT	Group	Mean	s.d.	t	df	Sig. (2-tailed)
18. I'm not as nice looking as most people.	CFS	0.39	0.488	.977	231	.330
	Comparison	0.32	0.470			
19. If I have something to say, I usually say it.	CFS	0.68	0.467	-.264	231	.792
	Comparison	0.70	0.462			
20. My parents understand me.	CFS	0.84	0.364	.627	232	.532
	Comparison	0.81	0.394			
21. Most people are better than me.	CFS	0.32	0.468	-.592	232	.554
	Comparison	0.36	0.483			
22. I usually feel as if my parents are pushing me.	CFS	0.39	0.490	3.184	231	.002*
	Comparison	0.19	0.392			
23. I often get discouraged at school.	CFS	0.25	0.433	-1.173	231	.242
	Comparison	0.32	0.470			
24. I often wish I were someone else.	CFS	0.31	0.465	.296	233	.768
	Comparison	0.29	0.458			
25. I can't be depended on.	CFS	0.22	0.415	.562	233	.574
	Comparison	0.19	0.392			

* Significant at p=<0.05

Table 5
***Coopersmith Inventory* Survey Results, 2006**

Trait	ALL (N-=239)		CFS (N=160)		COMPARISON GROUP (N=79)	
	Like Me	Unlike Me	Like Me	Unlike Me	Like Me	Unlike Me
1. Things usually don't bother me.	64.8% (151)	35.2% (82)	65.4% (104)	34.6% (55)	63.5% (47)	36.5% (27)
2. I find it very hard to talk in front of the class.	41.3% (97)	58.7% (138)	40.0% (64)	60.0% (96)	44.0% (33)	56.0% (42)
3. There are lots of things about myself I'd change if I could.	45.5% (106)	54.5% (127)	47.2% (75)	52.8% (84)	41.9% (31)	58.1% (43)
4. I can make up my mind without too much trouble.	70.9% (166)	29.1% (68)	71.3% (114)	28.8% (46)	70.3% (52)	29.7% (22)
5. I'm a lot of fun to be with.	89.4% (210)	10.6% (25)	89.4% (143)	10.6% (17)	89.3% (67)	10.7% (8)
6. I get upset easily at home.	35.9% (84)	64.1% (150)	35.0% (56)	65.0% (104)	37.8% (28)	62.2% (46)
7. It takes me a long time to get used to anything new.	30.6% (71)	69.4% (161)	29.6% (47)	70.4% (112)	32.9% (24)	67.1% (49)
8. I'm popular with kids my own age.	61.8% (144)	38.2% (89)	62.9% (100)	37.1% (59)	59.5% (44)	40.5% (30)
9. My parents usually consider my feelings.	79.5% (186)	20.5% (48)	83.0% (132)	17.0% (27)	72.0% (54)	28.0% (21)
10. I give in easily.	22.4% (52)	77.6% (180)	21.5% (34)	78.5% (124)	24.3% (18)	75.7% (56)
11. My parents expect too much of me.	34.9% (82)	65.1% (153)	33.8% (54)	66.3% (106)	37.3% (28)	62.7% (47)
12. It's pretty tough to be me.	48.1% (112)	51.9% (121)	51.6% (82)	48.4% (77)	40.5% (30)	59.5% (44)
13. Things are all mixed up in my life.	37.9% (89)	62.1% (146)	40.6% (65)	59.4% (95)	32.0% (24)	68.0% (51)
14. Kids usually follow my ideas.	52.6% (122)	47.4% (110)	53.8% (85)	46.2% (73)	50.0% (37)	50.0% (37)
15. I have a low opinion of myself.	21.9% (51)	78.1% (182)	23.3% (37)	76.7% (122)	18.9% (14)	81.1% (60)
16. There are many times when I'd like to leave home.	39.5% (92)	60.5% (141)	41.5% (66)	58.5% (93)	35.1% (26)	64.9% (48)
17. I often feel upset in school.	25.8% (60)	74.2% (173)	28.5% (45)	71.5% (113)	20.0% (15)	80.0% (60)
18. I'm not as nice looking as most people.	36.5% (85)	63.5% (148)	38.6% (61)	61.4% (97)	32.0% (24)	68.0% (51)
19. If I have something to say, I usually say it.	68.7% (160)	31.3% (73)	68.1% (109)	31.9% (51)	69.9% (51)	30.1% (22)
20. My parents understand me.	83.3% (195)	16.7% (39)	84.4% (135)	15.6% (25)	81.1% (60)	18.9% (14)
21. Most people are better than me.	33.3% (78)	66.7% (156)	32.1% (51)	67.9% (108)	36.0% (27)	64.0% (48)
22. I usually feel as if my parents are pushing me.	32.6% (76)	67.4% (157)	39.2% (62)	60.8% (96)	18.7% (14)	81.3% (61)
23. I often get discouraged at school.	27.0% (63)	73.0% (170)	24.7% (39)	75.3% (119)	32.0% (24)	68.0% (51)
24. 70.7% (53)	30.6% (72)	69.4% (163)	31.3% (50)	68.8% (110)	29.3% (22)	70.7% (53)
25. I can't be depended on.	20.9% (49)	79.1% (186)	21.9% (35)	78.1% (125)	18.7% (14)	81.3% (61)

Table 6
***Coopersmith Inventory* Survey Results**
Mean Average

TRAIT	ALL STUDENTS			CSF STUDENTS			COMPARISON GROUP		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
1. Things usually don't bother me.	233	.65	.479	159	.65	.477	74	.64	.485
2. I find it very hard to talk in front of the class.	235	.41	.493	160	.40	.491	75	.44	.500
3. There are lots of things about myself I'd change if I could.	233	.45	.499	159	.47	.501	74	.42	.497
4. I can make up my mind without too much trouble.	234	.71	.455	160	.71	.454	74	.70	.460
5. I'm a lot of fun to be with.	235	.89	.309	160	.89	.309	75	.89	.311
6. I get upset easily at home.	234	.36	.481	160	.35	.478	74	.38	.488
7. It takes me a long time to get used to anything new.	232	.31	.462	159	.30	.458	73	.33	.473
8. I'm popular with kids my own age.	233	.62	.487	159	.63	.485	74	.59	.494
9. My parents usually consider my feelings.	234	.79	.405	159	.83	.377	75	.72	.452
10. I give in easily.	232	.22	.418	158	.22	.412	74	.24	.432
11. My parents expect too much of me.	235	.35	.478	160	.34	.474	75	.37	.487
12. It's pretty tough to be me.	233	.48	.501	159	.52	.501	74	.41	.494
13. Things are all mixed up in my life.	235	.38	.486	160	.41	.493	75	.32	.470
14. Kids usually follow my ideas.	232	.53	.500	158	.54	.500	74	.50	.503
15. I have a low opinion of myself.	233	.22	.414	159	.23	.424	74	.19	.394
16. There are many times when I'd like to leave home.	233	.39	.490	159	.42	.494	74	.35	.481
17. I often feel upset in school.	233	.26	.438	158	.28	.453	75	.20	.403
18. I'm not as nice looking as most people.	233	.36	.482	158	.39	.488	75	.32	.470
19. If I have something to say, I usually say it.	233	.69	.465	160	.68	.467	73	.70	.462
20. My parents understand me.	234	.83	.373	160	.84	.364	74	.81	.394
21. Most people are better than me.	234	.33	.472	159	.32	.468	75	.36	.483
22. I usually feel as if my parents are pushing me.	233	.33	.470	158	.39	.490	75	.19	.392
23. I often get discouraged at school.	233	.27	.445	158	.25	.433	75	.32	.470
24. I often wish I were someone else.	235	.31	.462	160	.31	.465	75	.29	.458
25. I can't be depended on.	235	.21	.407	160	.22	.415	75	.19	.392

Student Behavior Rating Scale

The *Student Behavior Rating Scale* was distributed to the teachers of CFS and comparison students in spring 2006. The teachers were asked to rate their students on school behavior during the current school year. A total score was developed for the rating scale. The negatively-worded items were recoded to reflect a positive trend. An independent t-test was conducted to examine the differences of means of the total score between the CFS students and comparison group (Table 7). No significant difference was detected between the CFS and comparison students ($t=.614$, $p > 0.05$).

An independent t-test was conducted on each individual item in *the Student Behavior Rating Scale* (Table 8). The descriptive statistics are summarized in Tables 9, 10, 11, and 12.

Table 7
Comparison of *Student Behavior Rating Scale*
Total Scores of CFS and Comparison Students, 2006

Group	Mean	s.d.	t	df	Sig.
Chess for Success	68.98	13.41	.614	225	0.540
Comparison	67.83	13.06			

Table 8
***Student Behavior Rating Scale* Results**
t-test

TRAIT	Group	Mean	s.d.	t	df	Sig. (2-tailed)
1. Pays attention in class.	CFS	4.16	.865	1.172	237	.242
	Comparison	4.01	.940			
2. Completes homework on time.	CFS	4.26	1.052	.813	235	.417
	Comparison	4.14	1.181			
3. Attempts to do his/her work thoroughly and well rather than just trying to get by.	CFS	3.87	1.100	.469	237	.639
	Comparison	3.80	1.114			
4. Is persistent when confronted with difficult problems.	CFS	3.77	1.128	-.022	237	.983
	Comparison	3.77	1.132			
5. Approaches new assignments with sincere effort.	CFS	4.07	1.026	.235	232	.814
	Comparison	4.04	0.993			
6. Doesn't take independent initiative, must be helped to get started and keep going.	CFS	2.03	1.187	-1.300	237	.195
	Comparison	2.24	1.243			
7. Prefers to do easy problems rather than hard ones.	CFS	2.38	1.191	-.796	237	.427
	Comparison	2.51	1.218			
8. Tries to finish assignments even when they are difficult.	CFS	3.96	1.213	.862	237	.390
	Comparison	3.82	1.107			
9. Gets discouraged and stops trying when he/she encounters an obstacle in schoolwork.	CFS	2.12	1.266	.181	237	.856
	Comparison	2.09	1.088			
10. Works well with other children/ cooperates.	CFS	4.29	0.914	.764	237	.446
	Comparison	4.19	0.962			
11. Is restless and unable to stay still.	CFS	1.92	1.217	.042	236	.967
	Comparison	1.91	1.146			
12. Talks with classmates too much.	CFS	2.35	1.235	-.246	237	.806
	Comparison	2.39	1.285			
13. Needs to be reprimanded.	CFS	1.92	1.114	.633	236	.528
	Comparison	1.82	1.059			
14. Annoys other students or interferes with their work.	CFS	1.73	1.120	-.085	235	.932
	Comparison	1.75	0.980			
15. Follows school rules.	CFS	4.47	0.762	-.214	236	.831
	Comparison	4.49	0.714			
16. Is absent from school.	CFS	1.43	0.968	-.690	237	.491
	Comparison	1.52	1.036			
17. Displays enthusiasm about school.	CFS	3.90	1.035	.705	237	.482
	Comparison	3.80	1.102			

* Significant at p=<0.05

Table 9
***Student Behavior Rating Scale* Results for All Students in Study Sample (n=239)**

Behavior Trait	Almost Always	Frequently	Sometimes	Occasionally	Almost Never
1. Pays attention in class.	41.0% (98)	33.5% (80)	20.9% (50)	4.6% (11)	0.0% (0)
2. Completes homework on time.	56.5% (134)	22.4% (53)	11.8% (28)	5.5% (13)	3.8% (9)
3. Attempts to do his/her work thoroughly and well rather than just trying to get by.	36.0% (86)	27.2% (65)	25.5% (61)	7.9% (19)	3.3% (8)
4. Is persistent when confronted with difficult problems.	31.8% (76)	32.2% (77)	20.9% (50)	11.3% (27)	3.8% (9)
5. Approaches new assignments with sincere effort.	42.3% (99)	32.5% (76)	15.0% (35)	9.4% (22)	0.9% (2)
6. Doesn't take independent initiative, must be helped to get started and keep going.	3.3% (8)	13.8% (33)	16.3% (39)	22.2% (53)	44.4% (106)
7. Prefers to do easy problems rather than hard ones.	6.3% (15)	12.6% (30)	25.9% (62)	27.2% (65)	28.0% (67)
8. Tries to finish assignments even when they are difficult.	42.7% (102)	24.7% (59)	18.4% (44)	10.0% (24)	4.2% (10)
9. Gets discouraged and stops trying when he/she encounters an obstacle in schoolwork.	4.6% (11)	10.5% (25)	19.7% (47)	21.8% (52)	43.5% (104)
10. Works well with other children/cooperates.	51.5% (123)	29.3% (70)	13.4% (32)	5.0% (12)	0.8% (2)
11. Is restless and unable to stay still.	5.0% (12)	8.0% (19)	12.6% (30)	22.3% (53)	52.1% (124)
12. Talks with classmates too much.	7.5% (18)	12.1% (29)	20.9% (50)	28.0% (67)	31.4% (75)
13. Needs to be reprimanded.	2.1% (5)	8.8% (21)	15.5% (37)	22.7% (54)	50.8% (121)
14. Annoys other students or interferes with their work.	3.0% (7)	5.1% (12)	14.8% (35)	17.3% (41)	59.9% (142)
15. Follows school rules.	61.3% (146)	26.9% (64)	10.1% (24)	1.7% (4)	0.0% (0)
16. Is absent from school.	3.3% (8)	4.2% (10)	3.8% (9)	12.1% (29)	76.6% (183)
17. Displays enthusiasm about school.	33.9% (81)	31.4% (75)	25.5% (61)	5.9% (14)	3.3% (8)

Table 10
***Student Behavior Rating Scale* Results for CFS Students (n=160)**

Behavior Trait	Almost Always	Frequently	Sometimes	Occasionally	Almost Never
1. Pays attention in class.	42.5% (68)	34.4% (55)	19.4% (31)	3.8% (6)	0.0% (0)
2. Completes homework on time.	57.2% (91)	23.3% (37)	11.3% (18)	5.0% (8)	3.1% (5)
3. Attempts to do his/her work thoroughly and well rather than just trying to get by.	37.5% (60)	26.3% (42)	24.4% (39)	9.4% (15)	2.5% (4)
4. Is persistent when confronted with difficult problems.	31.3% (50)	33.1% (53)	21.3% (34)	10.0% (16)	4.4% (7)
5. Approaches new assignments with sincere effort.	44.5% (69)	29.0% (45)	16.1% (25)	9.7% (15)	0.6% (1)
6. Doesn't take independent initiative, must be helped to get started and keep going.	3.8% (6)	11.9% (19)	13.1% (21)	25.6% (41)	45.6% (73)
7. Prefers to do easy problems rather than hard ones.	5.6% (9)	13.1% (21)	23.1% (37)	29.4% (47)	28.8% (46)
8. Tries to finish assignments even when they are difficult.	46.9% (75)	22.5% (36)	15.0% (24)	11.3% (18)	4.4% (7)
9. Gets discouraged and stops trying when he/she encounters an obstacle in schoolwork.	5.6% (9)	11.9% (19)	16.9% (27)	20.0% (32)	45.6% (73)
10. Works well with other children/cooperates.	53.1% (85)	28.8% (46)	12.5% (20)	5.0% (8)	0.6% (1)
11. Is restless and unable to stay still.	5.0% (8)	9.4% (15)	11.3% (18)	20.8% (33)	53.5% (85)
12. Talks with classmates too much.	7.5% (12)	11.3% (18)	20.6% (33)	30.0% (48)	30.6% (49)
13. Needs to be reprimanded.	2.5% (4)	8.8% (14)	16.4% (26)	22.6% (36)	49.7% (79)
14. Annoys other students or interferes with their work.	3.8% (6)	5.1% (8)	14.6% (23)	13.9% (22)	62.7% (99)
15. Follows school rules.	61.6% (98)	25.8% (41)	10.7% (17)	1.9% (3)	0.0% (0)
16. Is absent from school.	3.8% (6)	2.5% (4)	4.4% (7)	11.3% (18)	78.1% (125)
17. Displays enthusiasm about school.	35.0% (56)	31.3% (50)	25.0% (40)	6.3% (10)	2.5% (4)

Table 11

***Student Behavior Rating Scale* Results for Comparison Students (n=79)**

Behavior Trait	Almost Always	Frequently	Sometimes	Occasionally	Almost Never
1. Pays attention in class.	38.0% (30)	31.6% (25)	24.1% (19)	6.3% (5)	0.0% (0)
2. Completes homework on time.	55.1% (43)	20.5% (16)	12.8% (10)	6.4% (5)	5.1% (4)
3. Attempts to do his/her work thoroughly and well rather than just trying to get by.	32.9% (26)	29.1% (23)	27.8% (22)	5.1% (4)	5.1% (4)
4. Is persistent when confronted with difficult problems.	32.9% (26)	30.4% (24)	20.3% (16)	13.9% (11)	2.5% (2)
5. Approaches new assignments with sincere effort.	38.0% (30)	39.2% (31)	12.7% (10)	8.9% (7)	1.3% (1)
6. Doesn't take independent initiative, must be helped to get started and keep going.	2.5% (2)	17.7% (14)	22.8% (18)	15.2% (12)	41.8% (33)
7. Prefers to do easy problems rather than hard ones.	7.6% (6)	11.4% (9)	31.6% (25)	22.8% (18)	26.6% (21)
8. Tries to finish assignments even when they are difficult.	34.2% (27)	29.1% (23)	25.3% (20)	7.6% (6)	3.8% (3)
9. Gets discouraged and stops trying when he/she encounters an obstacle in schoolwork.	2.5% (2)	7.6% (6)	25.3% (20)	25.3% (20)	39.2% (31)
10. Works well with other children/cooperates.	48.1% (38)	30.4% (24)	15.2% (12)	5.1% (4)	1.3% (1)
11. Is restless and unable to stay still.	5.1% (4)	5.1% (4)	15.2% (12)	25.3% (20)	49.4% (39)
12. Talks with classmates too much.	7.6% (6)	13.9% (11)	21.5% (17)	24.1% (19)	32.9% (26)
13. Needs to be reprimanded.	1.3% (1)	8.9% (7)	13.9% (11)	22.8% (18)	53.2% (42)
14. Annoys other students or interferes with their work.	1.3% (1)	5.1% (4)	15.2% (12)	24.1% (19)	54.4% (43)
15. Follows school rules.	60.8% (48)	29.1% (23)	8.9% (7)	1.3% (1)	0.0% (0)
16. Is absent from school.	2.5% (2)	7.6% (6)	2.5% (2)	13.9% (11)	73.4% (58)
17. Displays enthusiasm about school.	31.6% (25)	31.6% (25)	26.6% (21)	5.1% (4)	5.1% (4)

Table 12
***Student Behavior Rating Scale* Results**
Mean Average

TRAIT	ALL STUDENTS			CSF STUDENTS			COMPARISON GROUP		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
1. Pays attention in class.	239	4.11	.892	160	4.16	.865	79	4.01	.940
2. Completes homework on time.	237	4.22	1.095	159	4.26	1.052	78	4.14	1.181
3. Attempts to do his/her work thoroughly and well rather than just trying to get by.	239	3.85	1.102	160	3.87	1.100	79	3.80	1.114
4. Is persistent when confronted with difficult problems.	239	3.77	1.127	160	3.77	1.128	79	3.77	1.132
5. Approaches new assignments with sincere effort.	234	4.06	1.013	155	4.07	1.026	79	4.04	.993
6. Doesn't take independent initiative, must be helped to get started and keep going.	239	2.10	1.207	160	2.03	1.187	79	2.24	1.243
7. Prefers to do easy problems rather than hard ones.	239	2.42	1.199	160	2.38	1.191	79	2.51	1.218
8. Tries to finish assignments even when they are difficult.	239	3.92	1.178	160	3.96	1.213	79	3.82	1.107
9. Gets discouraged and stops trying when he/she encounters an obstacle in schoolwork.	239	2.11	1.208	160	2.12	1.266	79	2.09	1.088
10. Works well with other children/cooperates.	239	4.26	.929	160	4.29	.914	79	4.19	.962
11. Is restless and unable to stay still.	238	1.92	1.191	159	1.92	1.217	79	1.91	1.146
12. Talks with classmates too much.	239	2.36	1.249	160	2.35	1.235	79	2.39	1.285
13. Needs to be reprimanded.	238	1.89	1.095	159	1.92	1.114	79	1.82	1.059
14. Annoys other students or interferes with their work.	237	1.74	1.073	158	1.73	1.120	79	1.75	.980
15. Follows school rules.	238	4.48	.745	159	4.47	.762	79	4.49	.714
16. Is absent from school.	239	1.46	.990	160	1.43	.968	79	1.52	1.036
17. Displays enthusiasm about school.	239	3.87	1.057	160	3.90	1.035	79	3.80	1.102

RIT Scores by Year

Math and reading achievement scores were obtained for the students. It should be noted the sample size was smaller than anticipated due to a delay in securing parental consent for the study.

In spring 2004, for the CFS participants, the average RIT scores for reading and math were 215.92 and 216.58, respectively. For the comparison group, the average RIT scores for reading and math were 212.05 and 211.55, respectively (Table 13). In spring 2005, for the CFS participants, the average RIT scores for reading and math were 219.95 and 218.58, respectively. For the comparison group, the average RIT scores for reading and math were 215.88 and 214.15, respectively. In spring 2006, for the CFS participants, the average RIT scores for reading and math were 223.33 and 224.47, respectively. For the comparison group, the average RIT scores for reading and math were 221.65 and 221.34, respectively.

Table 13
Mean RIT Scores in Reading and Mathematics, Spring 2004, 2005, and 2006

Mean RIT Scores in Reading and Mathematics for Spring 2004									
	All Students			CFS			Comparison Group		
	Mean	s.d	Number	Mean	s.d.	Number	Mean	s.d.	Number
Reading	214.79	13.83	126	215.92	13.85	89	212.05	13.58	37
Math	215.08	10.23	127	216.58	9.57	89	211.55	10.95	38
Mean RIT Scores in Reading and Mathematics for Spring 2005									
	All Students			CFS			Comparison Group		
	Mean	s.d	Number	Mean	s.d.	Number	Mean	s.d.	Number
Reading	218.73	11.96	250	219.95	11.49	175	215.88	12.61	75
Math	217.27	11.03	254	218.58	10.78	179	214.15	11.06	75
Mean RIT Scores in Reading and Mathematics for Spring 2006									
	All Students			CFS			Comparison Group		
	Mean	s.d	Number	Mean	s.d.	Number	Mean	s.d.	Number
Reading	222.87	11.07	311	223.33	11.15	226	221.65	10.80	85
Math	223.62	11.51	314	224.47	12.21	229	221.34	9.06	85

Mathematics. In spring 2004, of the CFS participants, 12.2 percent did not meet standard, 42.2 percent met standard, and 45.6 percent exceeded standard. For the comparison group, about 18.4 percent did not meet standard, 52.6 percent met standard, and 28.9 percent exceeded standard (Figure 8).

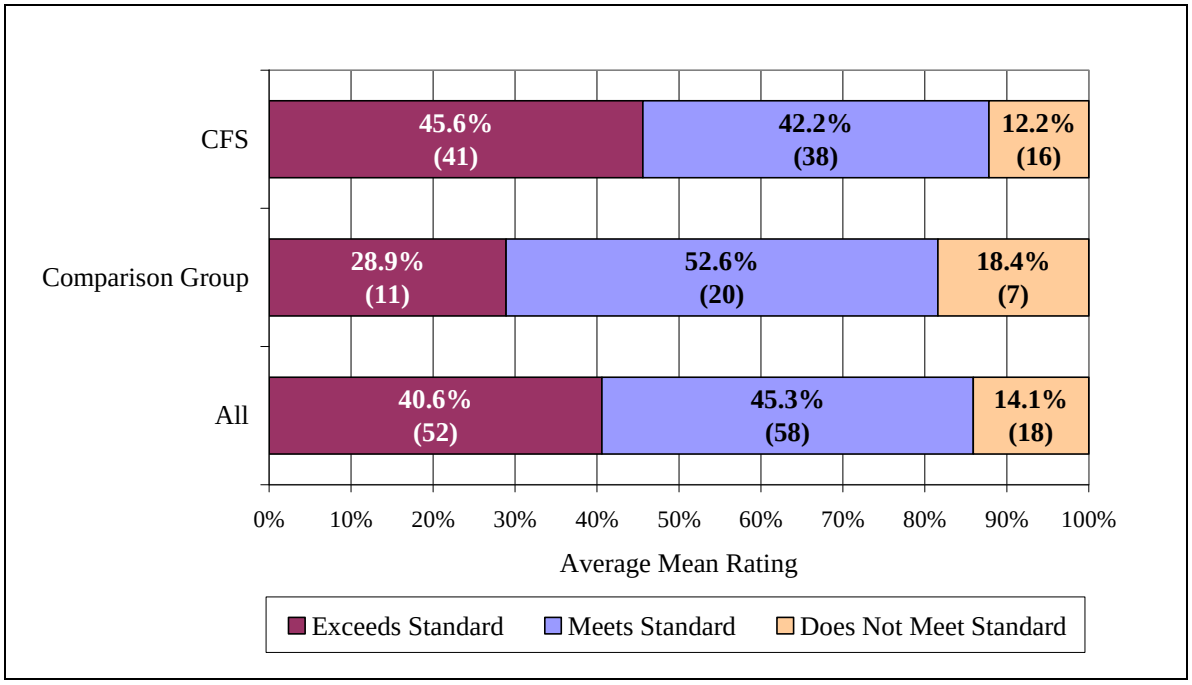

Figure 8. Achievement in Mathematics, 2004

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 14). A significant difference was detected between the two groups ($t=2.60$, $p<0.05$). The math RIT mean score of CFS participants (216.58) was significantly higher than that of the comparison group students (211.55).

Table 14
Comparison of Mathematics RIT Scores of CFS and Comparison Students, 2004

Group	Mean	s.d	t	df	Sig.
Chess for Success	216.58	9.57	2.60	125	0.011
Comparison	211.55	10.95			

Reading. In spring 2004, of the CFS participants, 17.8 percent did not meet standard, 33.3 percent met standard, and 48.9 percent exceeded standard. Of the comparison students, 24.3 percent did not meet standard, 35.1 percent met standard, and 40.6 percent exceeded standard (Figure 9).

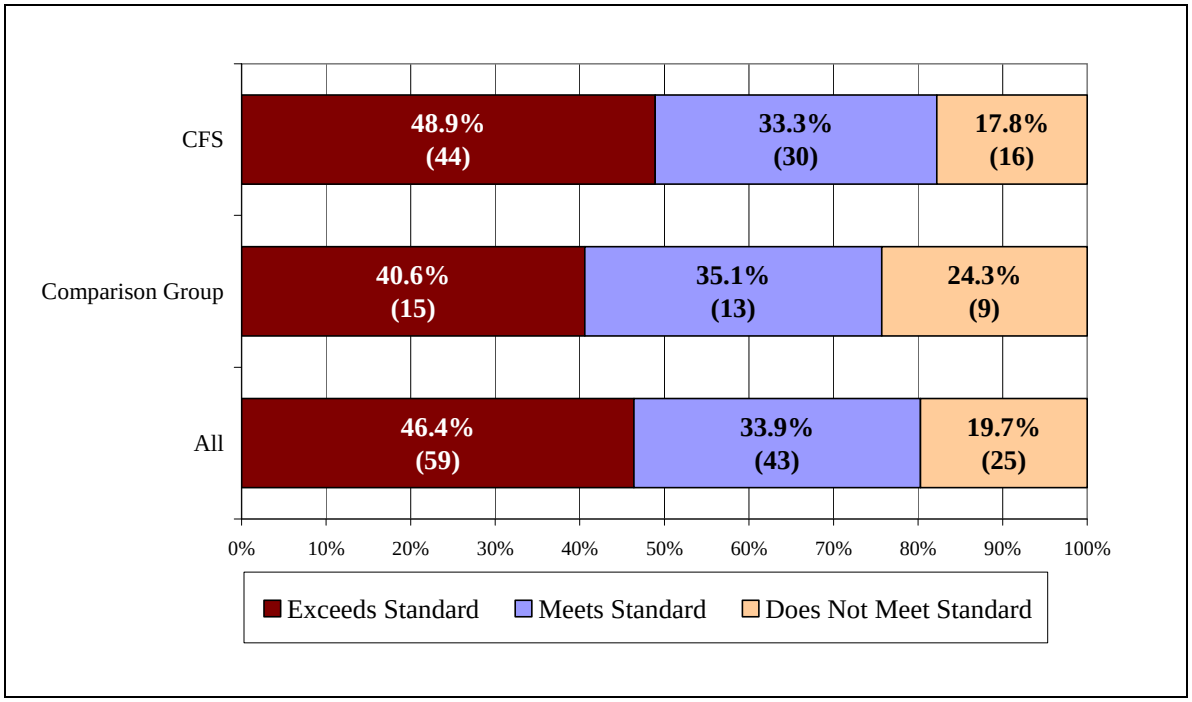

Figure 9. Achievement in Reading, 2004

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 15). No significant difference was detected between the two groups (t=1.436, p0.05).

Table 15
Comparison of Reading RIT Scores of CFS and Comparison Students, 2004

Group	Mean	s.d.	t	df	Sig.
Chess for Success	215.92	13.85	1.436	124	0.154
Comparison	212.05	13.58			

Mathematics. In spring 2005, of the CFS participants, 6.1 percent did not meet standard, 52.5 percent met standard, and 41.3 percent exceeded standard. For the comparison group, about 19.7 percent did not meet standard, 57.9 percent met standard, and 22.4 percent exceeded standard (Figure 10).

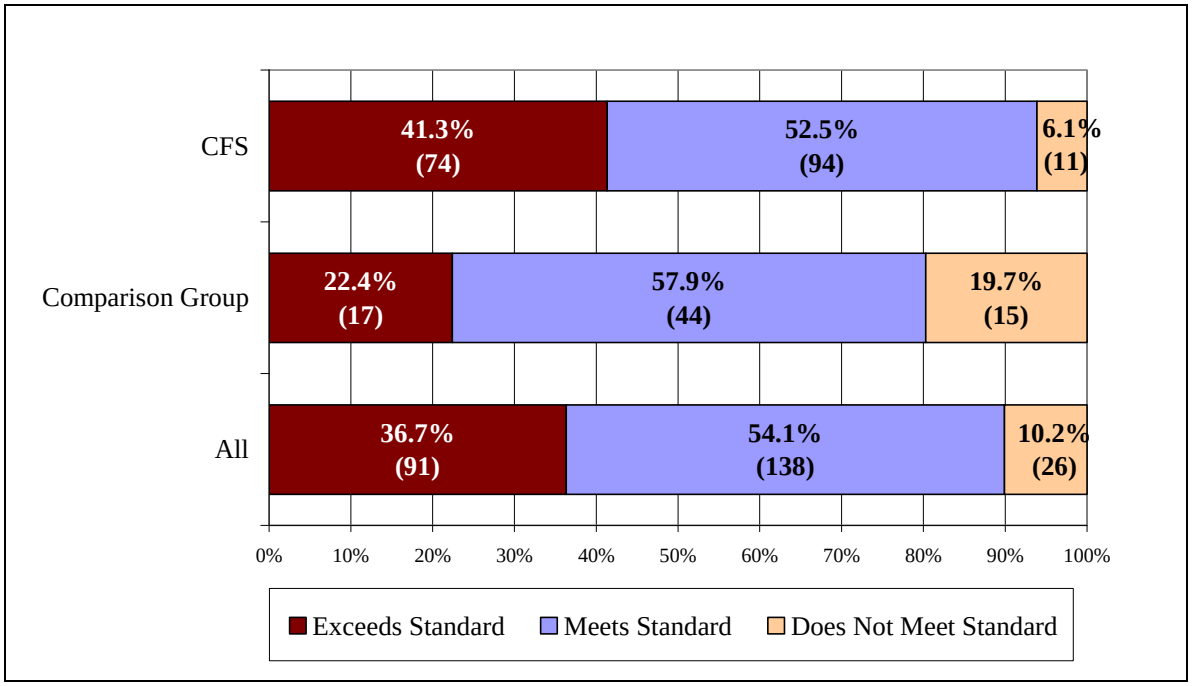

Figure 10. Achievement in Mathematics, 2005

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 16). A significant difference was detected between the two groups ($t=2.96$, $p<0.05$) indicating that the math RIT mean score of CFS students (218.58) was significantly higher than that of the comparison group students (214.15).

Table 16
Comparison of Mathematics RIT Scores of CFS and Comparison Students, 2005

Group	Mean	s.d	t	df	Sig.
Chess for Success	218.58	10.78	2.96	252	0.03
Comparison	214.15	11.06			

Reading. In spring 2005, of the CFS participants, 7.5 percent did not meet standard, 48.0 percent met standard, and 44.6 percent exceeded standard. Of the comparison students, 15.8 percent did not meet standard, 53.9 percent met standard, and 30.3 percent exceeded standard (Figure 11).

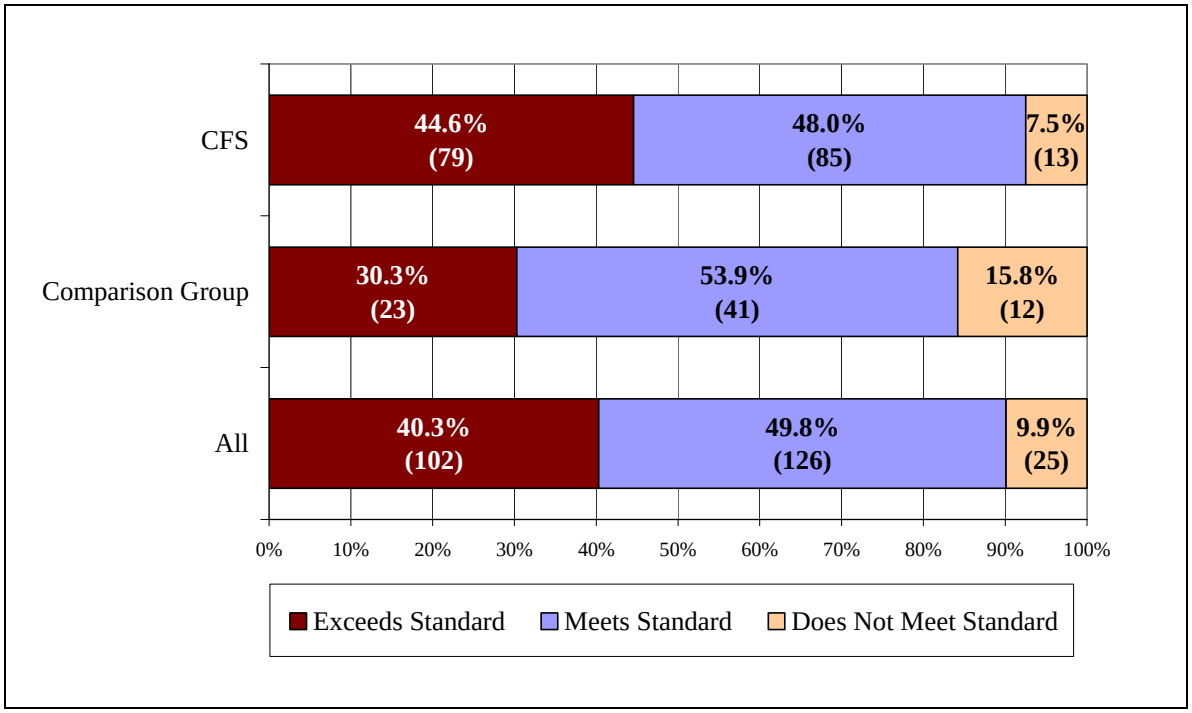

Figure 11. Achievement in Reading, 2005

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 17). A significant difference was detected between the two groups ($t=2.49$, $p<0.05$), indicating that the mean score of the CFS students (219.95) was significantly higher than that of the comparison group students (215.88).

Table 17
Comparison of Reading RIT Scores of CFS and Comparison Students, 2005

Group	Mean	s.d.	t	df	Sig.
Chess for Success	219.95	11.49	2.49	248	0.013
Comparison	215.88	12.61			

Mathematics. In spring 2006, of the CFS participants, 7.0 percent did not meet standard, 45.2 percent met standard, and 47.8 percent exceeded standard. For the comparison group, about 9.4 percent did not meet standard, 60.0 percent met standard, and 30.6 percent exceeded standard (Figure 12).

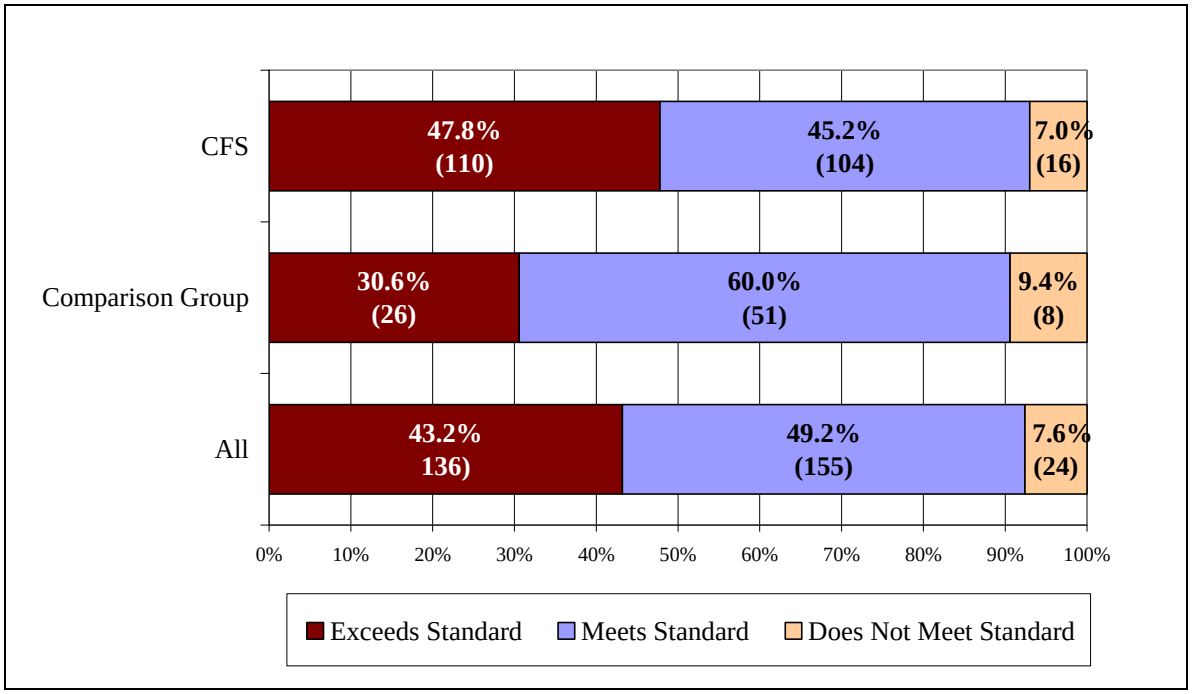

Figure 12. Achievement in Mathematics, 2006

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 18). A significant difference was detected between the two groups ($t=2.154$, $p<0.05$), indicating that the mean score of the CFS students (224.47) was significantly higher than that of the comparison group students (221.34).

Table 18
Comparison of Mathematics RIT Scores of CFS and Comparison Students, 2006

Group	Mean	s.d	t	df	Sig.
Chess for Success	224.47	12.21	2.154	312	0.032
Comparison	221.34	9.06			

Reading. In spring 2006, of the CFS participants, 8.3 percent did not meet standard, 48.7 percent met standard, and 43.0 percent exceeded standard. Of the comparison students, 10.5 percent did not meet standard, 57.0 percent met standard, and 32.6 percent exceeded standard (Figure 13).

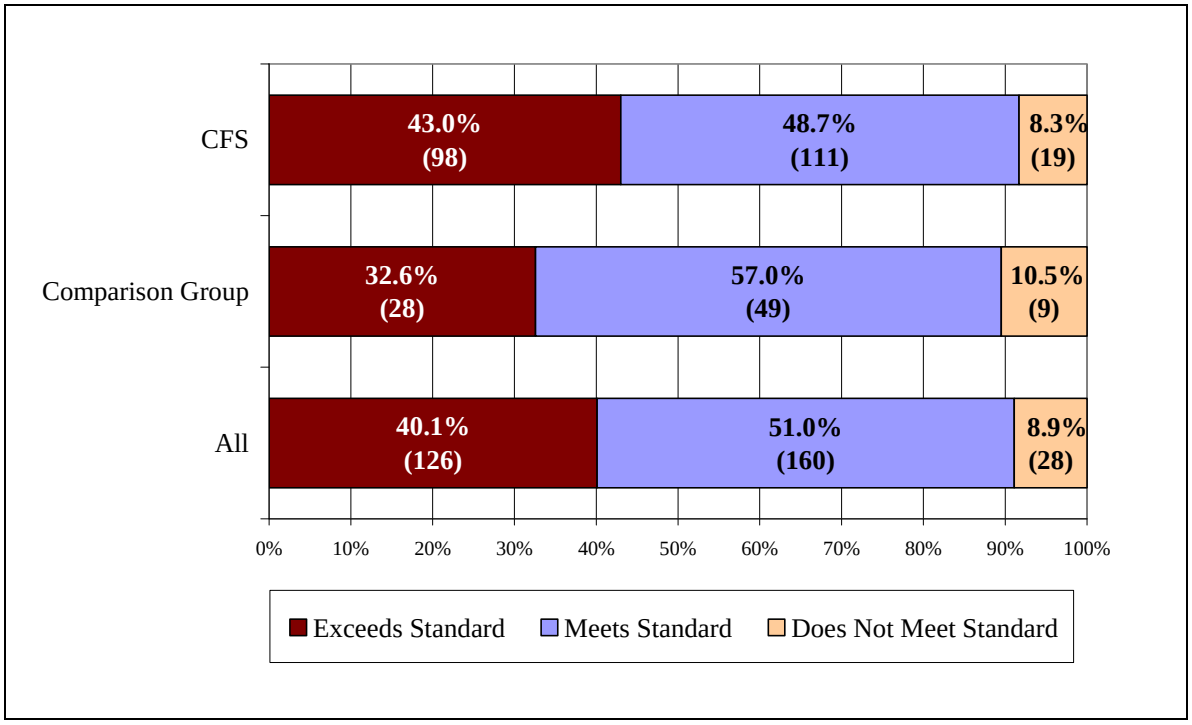

Figure 13. Achievement in Reading, 2006

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 19). No significant difference was detected between the two groups ($t=1.194$, $p>0.05$).

Table 19
Comparison of Reading RIT Scores of CFS and Comparison Students, 2006

Group	Mean	s.d.	t	df	Sig.
Chess for Success	223.33	11.15	1.194	309	0.233
Comparison	221.65	10.80			

RIT Scores by Grade

Third Grade

Mathematics

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 20). No significant difference was detected between the two groups (t=.862, p>0.05).

Table 20
Comparison of Third-Grade Mathematics RIT Scores of CFS and Comparison Students, 2006

Group	Mean	s.d.	t	df	Sig.
Chess for Success	220.79	11.01	.862	179	.390
Comparison	219.18	10.30			

Reading

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 21). No significant difference was detected between the two groups (t=.037, p>0.05).

Table 21
Comparison of Third-Grade Reading RIT Scores of CFS and Comparison Students, 2006

Group	Mean	s.d.	t	df	Sig.
Chess for Success	221.12	11.22	.037	178	.970
Comparison	221.04	12.42			

Fourth Grade

Mathematics

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 22). A significant difference was detected between the two groups (t=2.941, p<0.05).

Table 22
Comparison of Fourth-Grade Mathematics RIT Scores of CFS and Comparison Students, 2006

Group	Mean	s.d.	t	df	Sig.
Chess for Success	230.21	12.44	97	97	.004
Comparison	223.28	6.81			

Reading

An independent t-test was conducted to examine the differences of means between the CFS and comparison students (Table 23). No significant difference was detected between the two groups ($t=1.887$, $p>0.05$).

Table 23
Comparison of Fourth-Grade Reading RIT Scores of CFS and Comparison Students, 2006

Group	Mean	s.d.	t	df	Sig.
Chess for Success	226.63	10.59	1.887	95	0.62
Comparison	222.47	9.38			

Fifth Grade

The t-test was not conducted since it would not yield meaningful results with only eight students in the comparison group (Table 24). However, the means of the math and reading RIT scores were higher for the Chess for Success participants than for the comparison students.

Table 24
Comparison of Fifth-Grade Mathematics and Reading RIT Scores of CFS and Comparison Students, 2006

Group	N	Mean	s.d.
Chess for Success	25	230.21	12.44
Comparison	8	223.28	6.81
Group		**Mean**	**s.d.**
Chess for Success	25	226.63	10.59
Comparison	8	222.47	9.38

Attendance and Engagement

Eight (53%) coaches submitted attendance/engagement data for at least 75 percent of the weeks, with a range of data submission from 8 percent to 100 percent of the weeks. Reported attendance/engagement ranged from eight students (Thanksgiving week) to 137 students (a week in late October). On average, attendance/engagement was reported for 101 CFS students each week. Students attended for an average of 54 minutes per session, with a range from 47 minutes to 75 minutes, on average. In total, student participation in CFS ranged from 60 minutes to 1,665 minutes (with an average of 783 minutes and a median of 780 minutes).

A t-test was conducted to examine the difference between the male and female students. The tests were not significant, indicating that there was no significant difference between the two genders in attendance ($t=1.618$, $p>0.05$) and engagement ($t=1.218$, $p>0.05$) (Tables 25 and 26).

Table 25
Comparison of Attendance and Engagement of Participants, by Gender

		N	Mean	s.d.
Attendance	Male	108	50.4500	14.29898
	Female	63	46.1755	20.11109
	Total	**171**	**48.8752**	**16.74736**
			Mean	**s.d.**
Engagement	Male	107	2.4766	1.29441
	Female	55	2.7373	1.28222
	Total	**162**	**2.5651**	**1.29224**

Table 26
t-test, Comparison of Attendance and Engagement of Participants, by Gender

Group	t	df	Sig.
Attendance	1.618	169	.108
Engagement	1.218	160	.225

Regression Analyses

The goal of regression analysis is to determine the values of parameters for a function that cause the function to best fit a set of data observations that are provided. The general purpose of multiple regression (the term was first used by Pearson, 1908) is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. In this case, the dependent variables were Math RIT scores and Reading RIT scores. The predictor variables were group assignment (participant or comparison), attendance, engagement, student behavior, and self-esteem (*Coopersmith Inventory* score).

Student Achievement: Mathematics RIT Score (2006)

A multiple regression analysis was conducted with Math RIT score as dependent variable, and group assignment (participant or comparison), attendance, engagement, student behavior, and self-esteem (*Coopersmith Inventory* score) as predictor variables (Tables 27, 28, and 29). The regression model was significant ($F=8.287$, $p<0.05$), with $R=0.521$ and R-square $=0.272$. Among the predictor variables, only student behavior and self-esteem are significant at $p<0.05$, indicating that group assignment, attendance, and engagement may not be the best predictors of math student achievement.

Table 27
Multiple Regression Analysis, Mathematics RIT Score as Dependent Variable, All Participants, 2006

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.521	.272	.239	11.112

Table 28
ANOVA, Mathematics RIT Score as Dependent Variable, All Participants, 2006

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5116.031	5	1023.206	8.287	.000
	Residual	13705.166	111	123.470		
	Total	**18821.197**	**116**			

Table 29
Predictor Variables, Mathematics RIT Score as Dependent Variable, All Participants, 2006

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	183.366	10.570		17.348	.000
	Group_1	-3.664	6.023	-.052	-.608	.544
	Attendance	.167	.108	.131	1.545	.125
	Engagement	1.143	.928	.105	1.231	.221
	CPS_post_total	.684	.261	.225	2.618	.010
	SBRI_post_total	.319	.087	.322	3.677	.000

Another regression analysis was conducted using only the CFS students, with Math RIT score as dependent variable, and student behavior and self-esteem (*Coopersmith Inventory* score) as predictor variables (Tables 30, 31, and 32). The regression model was significant ($F=19.851$, $p<0.05$), with $R=0.487$ and R-square $=0.237$. The predictor variables (student behavior and self-esteem) are significant at $p<0.05$, indicating that they are good predictors of math student achievement.

Table 30
Multiple Regression Analysis, Mathematics RIT Score as Dependent Variable, CFS Participants, 2006

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.487	.237	.225	10.841

Table 31
ANOVA, Mathematics RIT Score as Dependent Variable, CFS Participants, 2006

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4666.156	2	2333.078	19.851	.000
	Residual	15043.478	128	117.527		
	Total	**19709.634**	**130**			

Table 32
Predictor Variables, Mathematics RIT Score as Dependent Variable, CFS Participants, 2006

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	189.742	5.870		32.322	.000
	CPS_post_total	.751	.233	.256	3.223	.002
	SBRI_post_total	.340	.076	.356	4.480	.000

Student Achievement: Reading RIT Score (2006)

A multiple regression analysis was conducted with Reading RIT score as dependent variable, and group assignment (participant or comparison), attendance, engagement, student behavior, and self-esteem (*Coopersmith Inventory* score) as predictor variables (Tables 33, 34, and 35). The regression model was significant ($F=7.223$, $p<0.05$), with $R=0.497$ and R-square $=0.247$. Among the predictor variables only attendance, student behavior and self-esteem are significant at $p<0.05$, indicating that group assignment and engagement may not be the best predictors of reading student achievement.

Table 33
Multiple Regression Analysis, Reading RIT Score as Dependent Variable, All Participants, 2006

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.497	.247	.213	9.787

Table 34
ANOVA, Reading RIT Score as Dependent Variable, All Participants, 2006

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3459.119	5	691.824	7.223	.000
	Residual	10536.571	110	95.787		
	Total	**13995.690**	**115**			

Table 35
Predictor Variables, Reading RIT Score as Dependent Variable, All Participants, 2006

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	176.856	9.311		18.994	.000
	Group_1	7.907	5.309	.131	1.489	.139
	Attendance	.211	.095	.192	2.208	.029
	Engagement	1.202	.818	.128	1.470	.145
	CPS_post_total	.588	.232	.224	2.535	.013
	SBRI_post_total	.208	.077	.243	2.702	.008

Another regression analysis was conducted using only the CFS students, with Reading RIT score as dependent variable, and student behavior and self-esteem (*Coopersmith Inventory* score) as predictor variables (Tables 36, 37, and 38). The regression model was significant ($F=14.012$, $p<0.05$), with $R=0.427$ and R-square $=0.182$. The predictor variables (student behavior and self-esteem) are significant at $p<0.05$, indicating that they are good predictors of reading student achievement.

Table 36
Multiple Regression Analysis, Reading RIT Score as Dependent Variable, CFS Participants, 2006

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.427	.182	.169	9.638

Table 37
ANOVA, Reading RIT Score as Dependent Variable, CFS Participants, 2006

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2603.337	2	1301.669	14.012	.000
	Residual	11704.663	126	92.894		
	Total	**14308.000**	**128**			

Table 38
Predictor Variables, Reading RIT Score as Dependent Variable, CFS Participants, 2006

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	196.688	5.251		37.459	.000
	CPS_post_total	.564	.210	.224	2.682	.008
	SBRI_post_total	.255	.069	.308	3.677	.000

Gender Analyses

An independent t-test was conducted to examine the differences of means of Reading RIT score 2004 between the male and female students in the CFS program (Table 39). The tests were not significant (t=.321, p>0.05), indicating that there were no significant differences between male (212.88) and female students (214.80).

Table 39
Comparison of Reading RIT Scores of Male and Female Students in CFS, 2004

Group	Mean	s.d.	t	df	Sig.
Male students	212.88	31.122	-.321	88	.749
Female students	214.80	14.084			

An independent t-test was conducted to examine the differences of means of Math RIT score 2004 between the male and female students in the CFS program (Table 40). The tests were not significant (t=.141, p>0.05), indicating that there were no significant differences between male (213.92) and female students (214.70).

Table 40
Comparison of Math RIT Scores of Male and Female Student in CFS, 2004

Group	Mean	s.d.	t	df	Sig.
Male students	213.92	29.513	-.141	88	.888
Female students	214.70	10.253			

An independent t-test was conducted to examine the differences of means of Reading RIT score 2005 between the male and female students in the CFS program (Table 41). The tests were not significant (9.956, p>0.05), indicating that there were no significant differences between male (219.30) and female students (221.02).

Table 41
Comparison of Reading RIT Scores of Male and Female Student in CFS, 2005

Group	Mean	s.d.	t	df	Sig.
Male students	219.30	12.060	-.956	173	.341
Female students	221.02	10.474			

An independent t-test was conducted to examine the differences of means of Math RIT score 2005 between the male and female students in the CFS program (Table 42). The tests were not significant (t=1.329, p>0.05), indicating that there were no significant differences between male (219.40) and female students (217.19).

Table 42
Comparison of Math RIT Scores of Male and Female Student in CFS, 2005

Group	Mean	s.d.	t	df	Sig.
Male students	219.40	10.732	1.329	177	.186
Female students	217.19	10.800			

An independent t-test was conducted to examine the differences of means of Reading RIT score 2006 between the male and female students in the CFS program (Table 43). The tests were not significant (t=-.696, p>0.05), indicating that there were no significant differences between male (222.94) and female students (224.01).

Table 43
Comparison of Reading RIT Scores of Male and Female Student in CFS, 2006

Group	Mean	s.d.	t	df	Sig.
Male students	222.94	11.575	-.696	224	.487
Female students	224.01	10.405			

An independent t-test was conducted to examine the differences of means of Math RIT score 2006 between the male and female students in the CFS program (Table 44). The tests were not significant (t=.868, p>0.05), indicating that there were no significant differences between male (225.00) and female students (223.54).

Table 44
Comparison of Math RIT Scores of Male and Female Student in CFS, 2006

Group	Mean	s.d.	t	df	Sig.
Male students	225.00	12.236	.868	227	.386
Female students	223.54	12.175			

Comparison of Students Meeting Reading and Mathematics Standards, 2006

A comparison of CFS students by state, district, and school was conducted to examine the percentage of students who exceeded, met, and had not met reading and math benchmarks in 2006. A comparison (Table 45, Figure 14) shows that the CFS students (91.7%) had a higher percentage in meeting or exceeding standards in reading in 2006 than the state (86.7%) and the district (87.7%) percentages. Moreover, CFS students (93.0%) had a higher percentage in meeting or exceeding standards in math in 2006 than state (88.3%) and district (89.7%) percentages.

Table 45
Comparison of Students Meeting Reading Standards, 2006

	Does Not Meet Standard	Meets Standard	Exceeds Standard
State	13.2%	53.0%	33.7%
District	12.3%	48.1%	39.6%
All CFS	**8.3%**	**48.7%**	**43.0%**
Arleta	16.4%	47.9%	35.6%
Astor	15.4%	33.3%	51.3%
Atkinson	9.4%	63.5%	27.1%
Beach	14.9%	59.3%	25.9%
Boise Eliot	12.4%	59.6%	28.1%
Bridger	18.2%	47.0%	34.8%
Chief Joseph	10.9%	56.4%	32.7%
Creston	13.3%	46.7%	40.0%
Humboldt	7.2%	73.8%	19.0%
Lee	27.3%	54.5%	18.2%
Lewis	13.3%	46.7%	40.0%
Scott	28.2%	45.7%	26.1%
Vernon	9.8%	58.5%	31.7%
Vestal	12.0%	62.0%	26.0%
Woodlawn	9.6%	75.3%	15.1%
Woodstock	18.0%	38.0%	44.0%

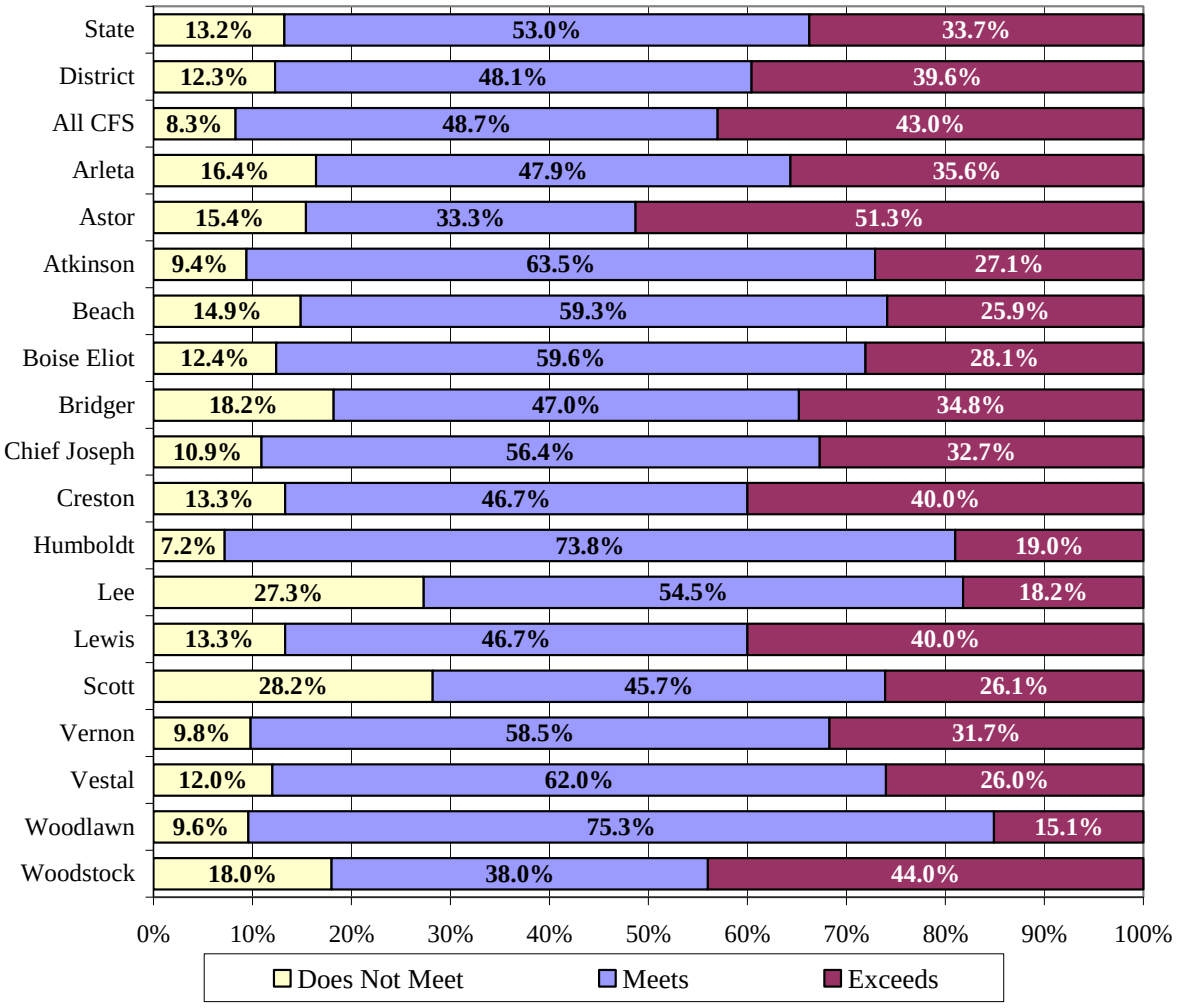

Figure 14. Comparison of Students Meeting Reading Standards, 2006

Table 46
Comparison of Students Meeting Mathematics Standards, 2006

	Does Not Meet Standard	Meets Standard	Exceeds Standard
State	11.7%	53.2%	35.1%
District	10.3%	49.2%	40.5%
All CFS	**7.0%**	**45.2%**	**47.8%**
Arleta	19.2%	52.1%	28.8%
Astor	7.7%	41.0%	51.3%
Atkinson	8.0%	65.5%	26.4%
Beach	23.0%	53.8%	23.1%
Boise Eliot	8.8%	77.2%	14.0%
Bridger	9.1%	63.6%	27.3%
Chief Joseph	23.7%	49.1%	27.3%
Creston	10.0%	46.7%	43.3%
Humboldt	11.9%	61.9%	26.2%
Lee	29.6%	43.2%	27.3%
Lewis	6.6%	60.0%	33.3%
Scott	14.9%	44.7%	40.4%
Vernon	No Numbers Reported		
Vestal	No Numbers Reported		
Woodlawn	13.7%	71.2%	15.1%
Woodstock	6.0%	26.0%	68.0%

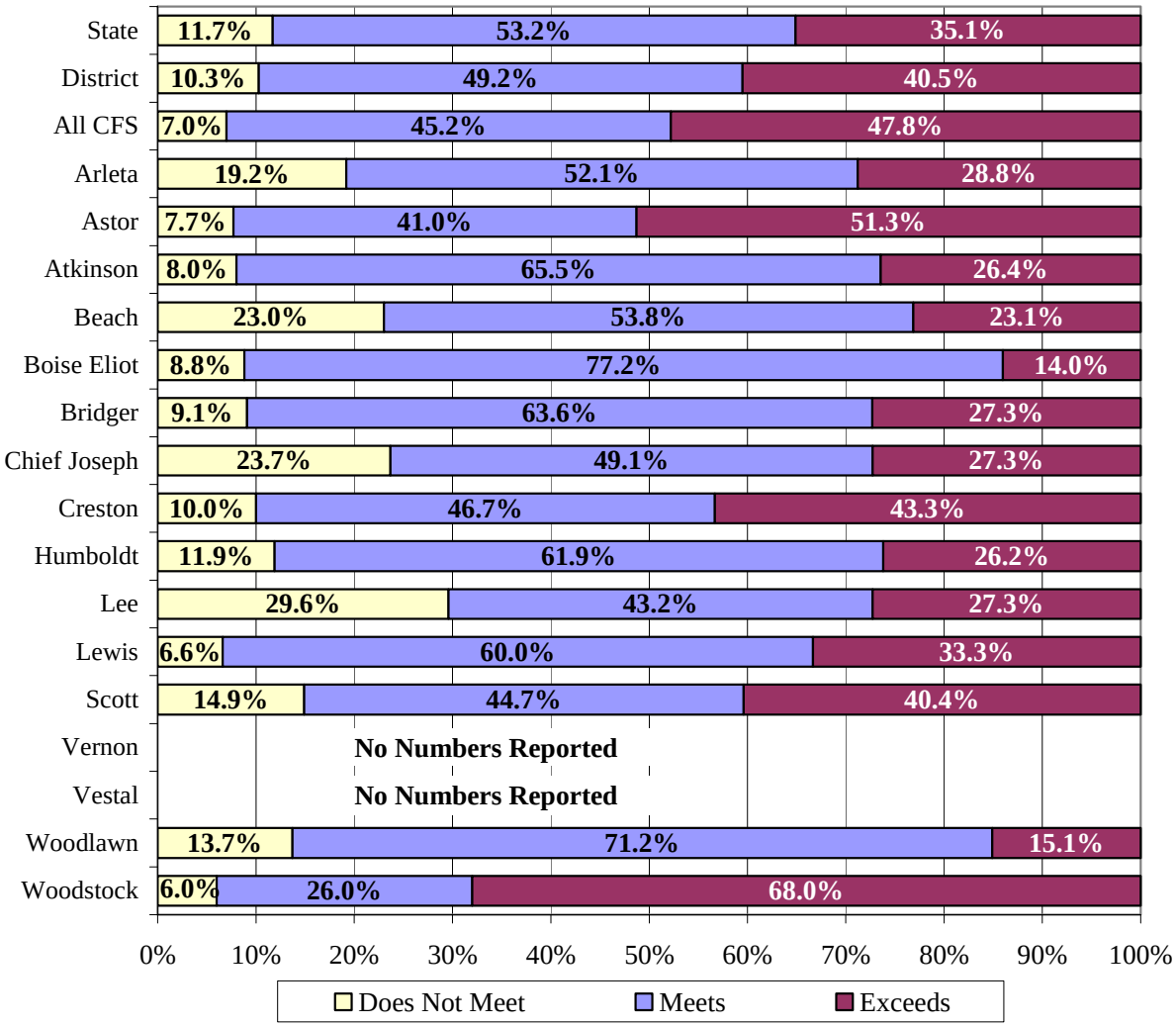

Figure 15: Comparison of Students Meeting Mathematics Standards, 2006

CONCLUSION

This report provides information on evaluation activities conducted in the 2004–2005 and 2005–2006 school years for Chess for Success (CFS), an after-school program that provides chess instruction to any student who wants to learn how to play chess. The primary goal of CFS is to use the game of chess to train and enable children to be patient and analytical in all problem-solving situations so that their academic achievement, as well as their self-esteem, will improve.

The study was focused on the collection of data on outcome variables, including student behavior, self-esteem, and academic achievement in mathematics and reading. In addition, demographic data, including gender, ethnicity, and English language learner (ELL) status were obtained for the participating and comparison students. Data also included records of students' attendance and engagement in CFS activities, as well as the perceptions about the program from CFS coaches.

For this evaluation report, student data were collected during the 2005–2006 school year for 321 students from 17 schools—233 CFS students (whose parents gave permission for their participation data to be used as part of the study) and 88 comparison students (not CFS participants, but for whom parent permissions were also received). It should be noted that the sample size was smaller than anticipated, mainly due to the low return rate of consent and release forms from parents.

Baseline data showed no statistically significant differences between the CFS and comparison groups for student behavior and self-esteem. The preliminary data indicated that the CFS and comparison students were highly similar with respect to not only demographic characteristics but also the key outcome variables. Thus, the baseline data provided a sound basis for the comparative analyses that was conducted in the second year of the study to assess program impact.

Short Term (Proximal) Student Impact: A telephone interview with coaches revealed that participants exhibited the following short-term program impact:

- Improving students' ability to follow directions, plan ahead, and think about the future.

- Improving students' academics, attention/focus, behavior, concentration, confidence (especially in primary grades), convergent/divergent thinking, logical reasoning, patience, problem solving (looking at things more carefully and learning strategies for dealing with different people), and self-esteem.

- Teaching commitment, consequences, cooperative behavior, resource management, sportsmanship (shake your opponents' hand, "learn from a loss—it's not the end of the world," "you're not always going to win," "setbacks happen"), and chess (playing better and taking more time looking at the board).

- Providing a safe, happy, comfortable, and social environment.

Research suggests that increases in these areas will have a positive long-term affect on assessment scores.

Findings

The study also looked at (a) Oregon math and reading assessment scores, (b) *Coopersmith Inventory* of student self-esteem, and (c) a project-developed, teacher-completed *Student Behavior Rating Scale* of CFS students and the comparison group of non-participants.

- No significant difference was found in attendance and engagement between the male and female students in the program.

- Regression analyses indicated that student behavior and self-esteem were good predictors of math and reading student achievement.

- The reading achievement was significantly different in 2005 between the CFS and comparison group. The math RIT scores were significantly different between the CFS and comparison in 2004, 2005, and 2006, indicating the program may have a more significant impact on student math achievement than on reading achievement.

- An independent t-test was conducted to examine the differences of means between the CFS and comparison students in mathematics in the fourth grade. A significant difference was detected between the two groups ($t=2.941$, $p<0.05$).

- A comparison of CFS students by state, district, and school was conducted to examine the percentage of students who exceeded, met, and had not met reading and math benchmarks in 2006. The CFS students (91.7%) had a higher percentage in meeting or exceeding standard in reading in 2006 than state (86.7%) and district (87.7%) percentages. Moreover, CFS students (93.0%) had a higher percentage in meeting or exceeding standard in math in 2006 than state (88.3%) and district (89.7%) percentages.

Recommendations

Despite the work that still needs to be done, this study provides some insights in impact of Chess for Success program. The project has accomplished its primary goal of training and enabling children to be patient and analytical in all problem-solving situations, which should lead to an increase in their academic achievement and self-esteem. It is important note that the schools in the study are Title I schools which have students who are the neediest students in terms of academic achievement and level of poverty.

This research sheds some light on the effects of Chess for Success program on student's self-esteem, behavior, and academic achievement. The study has raised a number of issues which future work might address.

- The data suggests that the CFS program is excellent in engaging high-performing students and keeping them involved in school. The high proportion of girls participating is especially encouraging. The program should keep recruiting more girls into the program.

- Continue to study the same cohort of students for a longer period of time so as to assess the long-term effect of the program.

- Continue to improve the implementation fidelity of the program. Are all the students in the program receiving the same instruction in playing chess, across the schools? What are the criteria for the recruitment of coaches?

After-school hours are a critical time for youth. That time can represent either an opportunity to learn and grow, through quality after-school programs, or a time of risk to youth's health and safety. These programs keep kids safe, improve academic achievement, and help relieve the stresses on today's working families. They can serve as important youth violence prevention and intervention strategies. After-school programs such as Chess for Success offer a healthy and positive alternative. There is a need for the program, as exemplified by staff members' comments and students' attendance and engagement. By offering the opportunity to participate in chess club programs and tournaments, the program is providing children in economically disadvantaged elementary and middle schools the opportunity to build and develop important skills necessary for success in school and life.
The value of an evaluation report such as this one lies not in any attempt to judge a program, but rather in its ability to contribute to the ongoing improvement of the program. The report is most useful if it stimulates discussion among stakeholders that leads to the program improvement.

APPENDIX

Data Collection Instruments and Instructions

Student Engagement/Attendance Form

Chess for Success

Weekly Attendance and Engagement Form

Week of October 3-7, 2005

This Week Our Class (select by bolding):
Met Monday
Met Tuesday
Met Wednesday
Met Thursday
Met Friday
Did Not Meet

Date of Class:
Time Class Started:
Time Class Ended:

						Engagement (X One)				
Group	**Grade**	**Gender**	**Ethnicity**	**Name**	**Present (X=Yes)**	**Rarely**	**Sometimes**	**Mostly**	**Always**	**Comments**

Coach Interview Protocol

Chess for Success
Coach Telephone Interview

1) **Chess for Success requires at least an hour per meeting, with the first 15 minutes of instruction in the beginning of the session. How well do you think this format works in your school? What are the strengths of this format?**

    - How can that format be improved?
    - If you do not use this format, what do you do instead?

2) **What days and times is your club available?**

3) **How has the Chess for Success teacher manual helped you as a chess coach?**

    - Is the manual user friendly?
    - How often do you refer to the manual?
    - What's the most useful part of the manual?
    - In what ways can it be made more useful?

4) **Do you use other materials, in addition to or instead of the teacher's manual? Please specify.**

5) **What assistance have you received from CFS program staff (Julie Young) to help you effectively implement the Chess for Success program in your school?**

    - What types of support does CFS offer you?
    - What other types of support would you like to have?

6) **What is the role of the program director in your chess club?**

    - How often does the program director attend your club activities?
    - Is the program director helpful to you? Why or why not?

7) **How would you rate the trainings/workshops provided by CFS? What was especially helpful? In what areas could you use more training?**

    - Were you aware of or did you attend any trainings/workshops?
    - Did you find the workshops useful?
    - How have you used knowledge gained in the workshops in your chess club?
    - Was the length of the workshop appropriate?

8) **Do you think the program is having an impact on students? In what ways? Please be specific.**

9) **Overall, what do you think is going especially well with this program?**

10) What are some challenges? Please be specific.

11) How can the program be further strengthened?

12) Does this school also offer a Chess Academy?

- What grades are eligible to participate?
- When is it offered?
- For how long?
- Please indicate if the following comparison students (listed by grade) participated in the Chess Academy

13) Do you have any further comments about the program?

Coopersmith Inventory School Form

Coopersmith Inventory School Form

Stanley Coopersmith, Ph.D

Please use a black pen or dark pencil to fill in the ovals completely

Name_____

School:_____

Date ___ ___/___ ___/__ ___

Grade

3	4	5
○	○	○

Gender

M	F
○	○

Student ID:

	__	__	__	__	__	__
1	○	○	○	○	○	○
2	○	○	○	○	○	○
3	○	○	○	○	○	○
4	○	○	○	○	○	○
5	○	○	○	○	○	○
6	○	○	○	○	○	○
7	○	○	○	○	○	○
8	○	○	○	○	○	○
9	○	○	○	○	○	○
0	○	○	○	○	○	○

Directions:

On the next pages, you will find a list of statements about feelings. If a statement describes how you feel, fill in the circle in the column "Like Me." If the statement does not describe how you usually feel, fill in the circle in the column "Unlike Me." There are no right or wrong answers.

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1	2	3	4	5	6	7	8	9	0
○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○

Coopersmith Inventory School Form

Please use a black pen or dark pencil and fill in the ovals completely.
(Fill in only one oval for each statement.)

Statement	Like Me	Unlike Me
1. Things usually don't bother me.	○	○
2. I find it very hard to talk in front of the class.	○	○
3. There are lots of things about myself I'd change if I could.	○	○
4. I can make up my mind without too much trouble.	○	○
5. I'm a lot of fun to be with.	○	○
6. I get upset easily at home.	○	○
7. It takes me a long time to get used to anything new.	○	○
8. I'm popular with kids my own age.	○	○
9. My parents usually consider my feelings.	○	○
10. I give in easily.	○	○
11. My parents expect too much of me.	○	○
12. It's pretty tough to be me.	○	○
13. Things are all mixed up in my life.	○	○
14. Kids usually follow my ideas.	○	○
15. I have a low opinion of myself.	○	○
16. There are many times when I'd like to leave home.	○	○
17. I often feel upset in school.	○	○
18. I'm not as nice looking as most people.	○	○
19. If I have something to say, I usually say it.	○	○
20. My parents understand me.	○	○
21. Most people are better than me.	○	○
22. I usually feel as if my parents are pushing me.	○	○
23. I often get discouraged at school.	○	○
24. I often wish I were someone else.	○	○
25. I can't be depended on.	○	○

Thank You Very Much!!!

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Student Behavior Rating Scale

Chess for Success
Student Behavior Rating Scale

Under a contract with the Office of Juvenile Justice and Delinquency Prevention (OJJDP), U.S. Department of Justice, the Northwest Regional Educational Laboratory (NWREL) is conducting an external evaluation of the Chess for Success (CFS) program implemented in Portland Public Schools. The purpose of the *Student Behavior Form* is to obtain the necessary information on student behavior from the classroom teacher. The information is confidential and will be used only for program evaluation purposes.

Please use a black pen or dark pencil to fill in the ovals completely

Name_____

School:_____

Date ___ ___/___ ___/__ ___

Grade

3	4	5
○	○	○

Gender

M	F
○	○

Student ID:

	__	__	__	__	__	__
1	○	○	○	○	○	○
2	○	○	○	○	○	○
3	○	○	○	○	○	○
4	○	○	○	○	○	○
5	○	○	○	○	○	○
6	○	○	○	○	○	○
7	○	○	○	○	○	○
8	○	○	○	○	○	○
9	○	○	○	○	○	○
0	○	○	○	○	○	○

Northwest Regional Educational Laboratory
101 SW Main Street, Suite 500
Portland, Oregon 97204

1	2	3	4	5	6	7	8	9	0
○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○

Chess for Success
Student Behavior Rating Scale

Directions:

The items below describe student behavior in school. Please consider the behavior of the student named above during **the current school year** and fill in the circle under the word that best describes his/her behavior in each area.

(Fill in only one oval for each statement.)

Statement	Almost Always	Frequently	Some-times	Occasionally	Almost Never
1. Pays attention in class.	○	○	○	○	○
2. Completes homework on time.	○	○	○	○	○
3. Attempts to do his/her work thoroughly and well rather than just trying to get by.	○	○	○	○	○
4. Is persistent when confronted with difficult problems.	○	○	○	○	○
5. Approaches new assignments with sincere effort.	○	○	○	○	○
6. Doesn't take independent initiative, must be helped to get started and keep going.	○	○	○	○	○
7. Prefers to do easy problems rather than hard ones.	○	○	○	○	○
8. Tries to finish assignments even when they are difficult.	○	○	○	○	○
9. Gets discouraged and stops trying when he/she encounters an obstacle in schoolwork.	○	○	○	○	○
10. Works well with other children/ cooperates.	○	○	○	○	○
11. Is restless and unable to stay still.	○	○	○	○	○
12. Talks with classmates too much.	○	○	○	○	○
13. Needs to be reprimanded.	○	○	○	○	○
14. Annoys other students or interferes with their work.	○	○	○	○	○
15. Follows school rules.	○	○	○	○	○
16. Is absent from school.	○	○	○	○	○
17. Displays enthusiasm about school.	○	○	○	○	○

Thank You Very Much

Northwest Regional Educational Laboratory
101 SW Main Street, Suite 500
Portland, Oregon 97204

Letter of Information for Principals

(503) 275-9632 (503) 275-0450 roccogra@nwrel.org

October 14, 2005

[Principal]
[School]
[Address]

Dear [Principal]:

Last year the Northwest Regional Educational Laboratory (NWREL) in collaboration with *Chess for Success* initiated a study of *Chess for Success* in several of Portland Public Schools' elementary schools. That study is continuing this year and, as many of last year's participants were fifth-grade students, has expanded into several middle schools as well. Your school is among the 21 participating schools.

The study is quasi-experimental in design and involves third-, fourth-, fifth-, and sixth-grade students participating in *Chess for Success.* It also includes students (who are not participating in *Chess for Success*) matched to each of the *Chess for Success* students by PPS staff in Research and Evaluation (comparison students). The study is looking at the impact participation has on student behavior, self-esteem, and academic performance.

Chess for Success coaches, teachers of students participating in the study, and some of your school's students will be involved in the study in a number of ways.

- Coaches are assisting with the data collection during the school year.
  - During the fall, they are assisting with the distribution and collection of permission slips (enclosed) for the study. For each student in the study (*Chess for Success* and comparison) NWREL is in need of a PPS Permission to Release Information form (so that NWREL can have access to demographic and achievement data) and a second form that gives the student permission to complete a self-esteem survey. This month coaches are distributing these forms along with a letter describing the study (enclosed).
  - During the fall they will also be tracking the attendance and level of engagement of students participating in the *Chess for Success* class.
  - In February, they will participate in a brief telephone interview regarding implementation of the program during the school year.

- Teachers will be asked to complete a student behavior survey (enclosed) for every *Chess for Success* and comparison student they have in their class. Surveys will be distributed in November and March. The *Chess for Success* program director assigned to your school will be coordinating that activity and they will be in touch with you shortly, if they haven't already done so.

- *Chess for Success* and comparison students will complete a self-esteem survey (enclosed) in November and March. The same program director will be coordinating this activity as well.

In most cases the *Chess for Success* coach in your school is a PPS employee. NWREL and *Chess for Success* coaches and directors who are not PPS employees cannot have access to the list of students selected as comparison students in order to distribute and collect the permission slips. In these cases, we are requesting your assistance (or another PPS employee who you designate) in helping distribute and collect the signed permission slips from the students. Julie Young, the Director of *Chess for Success* should have spoken with you about this. These names, along with other data collected for the study will remain confidential and survey results will only be reported in aggregate.

Thank you for your cooperation. Feel free to call me at 503-275-9632 if you have any questions.

Sincerely,

Angela Roccograndi

Angela Roccograndi
NWREL, Evaluation Program

Enc: PPS and NWREL permission forms
Parent letters
Student Behavior Rating Scale
Coopersmith Inventory School Form

Chess Academy Survey

Chess for Success
Chess Academy Survey

Name: _____

School: _____

1. Does this school also offer a Chess Academy? ❑ Yes ❑ No

   What is a Chess Academy? A Chess Academy provides an opportunity for students not old enough to participate in Chess for Success (generally K-2) to receive an introduction to the game of chess. Typically an academy is held in the spring and generates interest in the game for fall enrollment in Chess Club.

If yes,

2. What grades are eligible to participate? ❑ K ❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5 ❑ 6
3. When is it offered?
4. For how long?
5. Please indicate if the following comparison students (listed on the attached page) participated in this year's Chess Academy at your school.

Thank you!

Letter of Information for Parents

(503) 275-9632 (503) 275-0450 roccogra@nwrel.org

September 6, 2005

Dear Parents/Guardians:

Your child has been chosen to take part in a very important study, approved by Portland Public Schools. We are studying the *Chess for Success* program to help understand what impact this activity—and the game of chess—is having on its participants.

Our study involves the collection of some basic information from chess club students and also from students not involved in the chess club, but who are going to the same school.

Why is this study important? This is the first worldwide, multi-year study of the game of chess. In 2004, the U.S. Congress voted to provide the funding, and many school children are taking part.

How many schools are involved? *Chess for Success* is offered in 35 elementary and middle schools in Portland. We will study the program in 21 of them, one of which is your child's. We expect over 1,000 students to participate.

What are the enclosed forms? The completed forms give your child permission to take part in the study. They allow Portland Public Schools to release information about your child to us for the study.

- The YELLOW FORM is a release form that gives Portland Public Schools permission to share data with us. **ANY INFORMATION WE RECEIVE WILL NOT BE SHARED WITH ANY OTHER PEOPLE**. It is just for the study.
- The BLUE FORM allows your child to participate in a brief survey. **Survey responses will remain strictly confidential.** Only anonymous, group (aggregate) results will be used.

How do you enroll your child in the study? For your child to participate, you need to fill out and return the yellow form and the top part of the blue form.

If you decide that you do not want your child to participate, please complete the bottom-most section of the blue form—declining participation—and return it as instructed. Keep the second blue form for your records.

Please return the completed forms to
either your child's teacher or the *Chess for Success* coach
by Friday, October 21, 2005.

As our thanks to you for submitting the completed paperwork, your name will be entered into a drawing to win a $100 gift certificate from Fred Meyers. The drawing will be held November 18, 2005.

Thank you for taking the time to fill out these forms. If you have questions, please contact me at 503-275-9632.

Sincerely,

Angela Roccograndi
Evaluation Associate, NWREL

(503) 275-9632 (503) 275-0450
roccogra@nwrel.org

September 6, 2005

Dear Parents/Guardians:

Last year your child participated in the *Chess for Success* program. They were part of a study, approved by Portland Public Schools, to determine the impact that *Chess for Success* is having on students. That study is continuing this fall and will end in the spring of 2006. This letter is to acknowledge you and your child's commitment to participate in this study. We want to remind you that your child can continue to participate in *Chess for Success* as a sixth-grade student.

The following is a list of the *Chess for Success* coaches in each of the participating Portland schools with sixth-grade enrollments. We encourage your child to continue with their chess activity, and continue to be a part of our study. To do this, they should get in touch with the coach at their current school (listed below). *Chess for Success* will start, at most schools, in the beginning of October and will continue through March, 2006.

- Beach: Katrina Halverson
- Beaumont: Will Everett
- Gregory Heights: Tim Revett
- Humboldt: Mark Gast
- Kellogg: Jeff Johnson
- Ockley Green: Amy Wood
- Portsmouth: Edwin Wack
- Vernon: Don Meikle
- Woodlawn: Phyllis Newsome-Taylor and Don Smith

Each child that re-enrolls in *Chess for Success* as a sixth-grade student will have their name entered into a drawing to represent you for the chance to win a $100 gift certificate from Fred Meyers. The drawing will be held November 18, 2005.

Thank you for encouraging your child to continue with chess. If you have questions, please contact me at 503-275-9632.

Sincerely,

Angela Roccograndi
Evaluation Associate, NWREL

Letter of Consent for Administration of *Coopersmith Inventory*

Informed Consent for Responding to Surveys in Chess for Success Study
Northwest Regional Educational Laboratory

The Northwest Regional Educational Laboratory (NWREL) is conducting a study to evaluate the Chess for Success (CFS) program in your child's school. CFS is an after-school program that provides chess instruction to any student who wants to learn how to play chess. The primary goal of CFS is to use the game of chess to help children learn how to be patient and analytical in problem-solving situations. The program also seeks to increase student self-esteem and academic achievement. The study will examine the extent to which participation in the program impacts student academic achievement, self-esteem, and behavior.

All students participating in CFS as well as a group of students not participating in CFS are being asked to participate in the study. Participation in the study is voluntary. Your child can still participate in the CFS program even if you do not wish them to be involved in the evaluation study. The study includes responding to a self-esteem survey to be administered to your child in the fall and again in the spring. **Survey responses will remain strictly confidential and only group results will be reported**. Responding to the survey is **voluntary.** Students do not have to answer any questions that they don't want to answer.

NWREL needs your permission to include your child in the study. If you have any questions about the study at any time, please call Angela Roccograndi (NWREL) at 503-275-9632.

Please sign this form if you wish to allow your child to participate in the study.

Student Name	
School Name	

I have read the above statement of informed consent, understand the purpose of the study, and have received a copy of this informed consent statement to keep. I understand that participation is voluntary and that my child can drop out of the study at any time.

Name of Student (Print)	Signature of Student	Date

Name of Parent (Print)	Signature of Parent	Date

Please sign and return this form to your child's CFS coach or teacher no later than Friday, September 16, 2005.

Letter of Consent for Release of Student Records

Portland Public Schools Research & Evaluation Department

PERMISSION TO RELEASE INFORMATION

As Parent/Guardian, I authorize the release and exchange of confidential information between Portland Public Schools and the Northwest Regional Educational Laboratory. The disclosure is to be used for the purpose of program evaluation. This authorization is good through December 2006.

Student Name:	
Student Date of Birth:	
School Name:	

Information released will include the following specific student records:

- Student Directory Information (including student's name, address, telephone listing, photograph, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended)
- Academic Information (report cards, test scores)
- Family Background Data (ethnicity, demographics)

I hereby approve the release of information as indicated above. I may revoke this authorization in writing at any time. Such revocation may not be retroactive.

_____

Parent/Guardian Signature Date

_____

Printed Name of Parent/Guardian

_____

Student Signature Date

_____

Printed Name of Student

Please return this form to your child's Teacher or Chess for Success Coach, no later than Friday, October 21, 2005.

Guidelines for Data Collection

Chess for Success
Spring 2006 Data Collection Guidelines

Coopersmith Inventory School Form

A Coopersmith Self-Esteem Inventory should be completed by each student participating in the study (see list). Each survey contains the student name, an identification number, and the school. Also provided is a pre-sharpened pencil (students can keep them when finished). Ask the student to "bubble in" their grade and gender. Whether you are administering the inventory to a group of students or individually, please give a brief introduction. An example of how you might introduce it to a student is:

> Today you will be filling out a questionnaire. I will read the statement out loud. First, decide if the statement is like you or unlike you. Then, fill in the circle (point to the circle) that matches what you think. For example, if you think the statement is unlike you, fill in this circle (point to the circle in the "unlike me" column). If you think the statement is like you, fill in the other circle here labeled "like me" (point to the circle in the column for "like me"). "Like me" is like saying 'yes' and "unlike me" is like saying 'no'. For example, if I said the statement "I enjoy going to the movies," is that like you or unlike you? Whatever you think is what I want you to fill out. Your answers will not be shared with your teachers, parents, or me. Ready? Let's begin.

The words 'self-esteem,' 'self-concept,' and 'self-evaluation' should not be used. This will help prevent biased responses, which may invalidate the test. Note that the inventory is titled "Coopersmith Inventory" and the term 'self-esteem' does not appear on the forms.

Student Behavior Rating Scale

A student behavior form should be completed for each student by the classroom teacher (see list). Each survey contains the student name, an identification number, and the school. Also provided is a pre-sharpened pencil (teachers can keep them when finished). Ask the teacher to "bubble in" the student's grade and gender. Please be sure to inform teachers that CFS and comparison students are in the study. Not every student who will have a survey will be enrolled in CFS. In the directions it asks teachers to circle the word that best describes the student's behavior. Because this is a scannable form, **we need teachers to FILL the circle below the word, not circle the word.**

Submitting Data to NWREL

After each administration of the *Coopersmith Inventory School Form* and the *Student Behavior Rating Scale*, complete the appropriate "Director's Data Collection Report." **Please return the completed forms and data collection reports by April 14, 2006**. A postage-paid envelope is enclosed.

Data Collection Reports

Chess for Success
Coopersmith Inventory School Form
Director's Data Collection Report

Please complete the following report *each* time you administer the inventory to one or more students at a school. Submit this written report with your completed surveys in the provided envelope.

Name: _____

School: _____

Date: _____ Start Time (HH:MM): _____

Location: _____ End Time (HH:MM): _____

Total Number of Students Completing Survey: _____

❑ Individual ❑ Group ❑ Both Formats

❑ CFS Students Only ❑ Comparison Students Only ❑ Both Students

1. Note any questions students had about the survey (item number, what they didn't understand):

2. Note any problems encountered administering the survey (noisy, hot, a lot of distractions, no tables, presence of interpreter)

3. Were there any students who completed the survey where you question the survey's reliability or validity? If so, please indicate the student's name and provide a brief explanation.

Chess for Success
Student Behavior Rating Scale
Director's Data Collection Report

Please complete the following report *each* time you administer the inventory to one or more teachers in a school. Submit this written report with your completed surveys in the provided envelope.

Name: _____

School: _____

Date: _____ Start Time (HH:MM): _____

Location: _____ End Time (HH:MM): _____

Total Number of Teachers Completing Survey: _____

❑ Individual ❑ Group ❑ Both Formats

4. Note any questions teachers had about the survey:

5. Note any problems encountered administering the survey: