

# DO STUDENTS TAKING STEP 2 CK LATER DO BETTER OR WORSE?

## IT DEPENDS ON HOW YOU LOOK AT IT

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### ABSTRACT

**Purpose.** While most students take Step 1 between mid-May and mid-July of their second year, students vary substantially when they take Step 2 CK. Students' decisions about when to take Step 2 CK may depend on Step 1 performance. Those with high Step 1 scores may delay taking Step 2 CK, thus avoiding the risk that a relatively low Step 2 CK score could adversely affect obtaining residency interviews or rankings; low Step 1 scores may induce students to take Step 2 CK, hoping that a relatively high Step 2 CK score could enhance the interview and ranking process. This study investigated whether the timing of Step 2 CK translates into differential Step 2 CK performance.

**Method.** Step 1 and Step 2 CK scores on first attempt were assembled for all students who 1) graduated from LCME-accredited medical schools in 2006, 2007, and 2008 and 2) took both exams before graduation. For each year, means and SDs by month of test administration were calculated, and regression analyses were run predicting Step 2 CK from Step 1 and the month Step 2 CK was taken.

**Results.** Regressions of Step 2 CK on Step 1 varied substantially by month of administration. For a given Step 1 score, the predicted Step 2 CK score varied by as much as 12 points depending upon month, with higher than expected Step 2 CK scores if the exam was taken early enough to affect residency interviews and rankings. In addition, a fairly large proportion of students with high Step 1 scores deferred taking Step 2 CK until nearer graduation.

**Conclusions.** The relationship between Step 1 and Step 2 CK performance is clearly mediated by when Step 2 CK is taken. The presentation will explore alternate explanations.

### BACKGROUND

Since USMLE Step 1, 2 CK and 3 examinations have been administered by computer at Prometric Centers, examinees have been able to take the examinations essentially on any day during the year. There may be factors that influence when examinees decide to schedule their examinations. Medical schools may not only require a passing grade on Step 1 and/or Step 2 CK but they also may require that examinations be taken by a certain date. Other factors may differentially influence students' behavior. After entry into medical school, the next most important decision for students is the specialty in which they will continue their training and where. Students who do well on Step 1 may delay taking Step 2 CK if they feel a lower score on Step 2 CK may affect their chances of getting interviews in a particular specialty or affect where they match. For instance, a student who scores a 250 on Step 1 who wants to specialize in Dermatology may wait until after January to take Step 2 CK, anticipating that the Step 1 score will get him/her invited for interviews in Dermatology. In contrast, students who do not score as well on Step 1 may be motivated to take Step 2 CK earlier, anticipating that a better Step 2 CK score than a Step 1 score would positively influence being invited for interviews and where they would match. For instance, a student wanting to pursue a career in Internal Medicine who has a 190 on Step 1 may be motivated to take Step 2 CK in July, anticipating a higher score on Step 2 CK would help him/her match at a more highly competitive internal medicine program. Students taking Step 2 CK in May-September will be highly motivated to study, whereas students taking Step 2 CK after mid-January will have less motivation to do as well on Step 2 CK.

### METHODS

**Subjects:** U.S. Graduates of an LCME-accredited medical school  
**Cohort:** 2006, 2007, 2008

**Inclusion Criteria:** Took Step 1 and Step 2 CK before graduation in 2006, 2007 and 2008

**Data Collected:** Scores on first attempt of Step 1 and Step 2 CK, month and year examinations were taken (in relation to graduation)

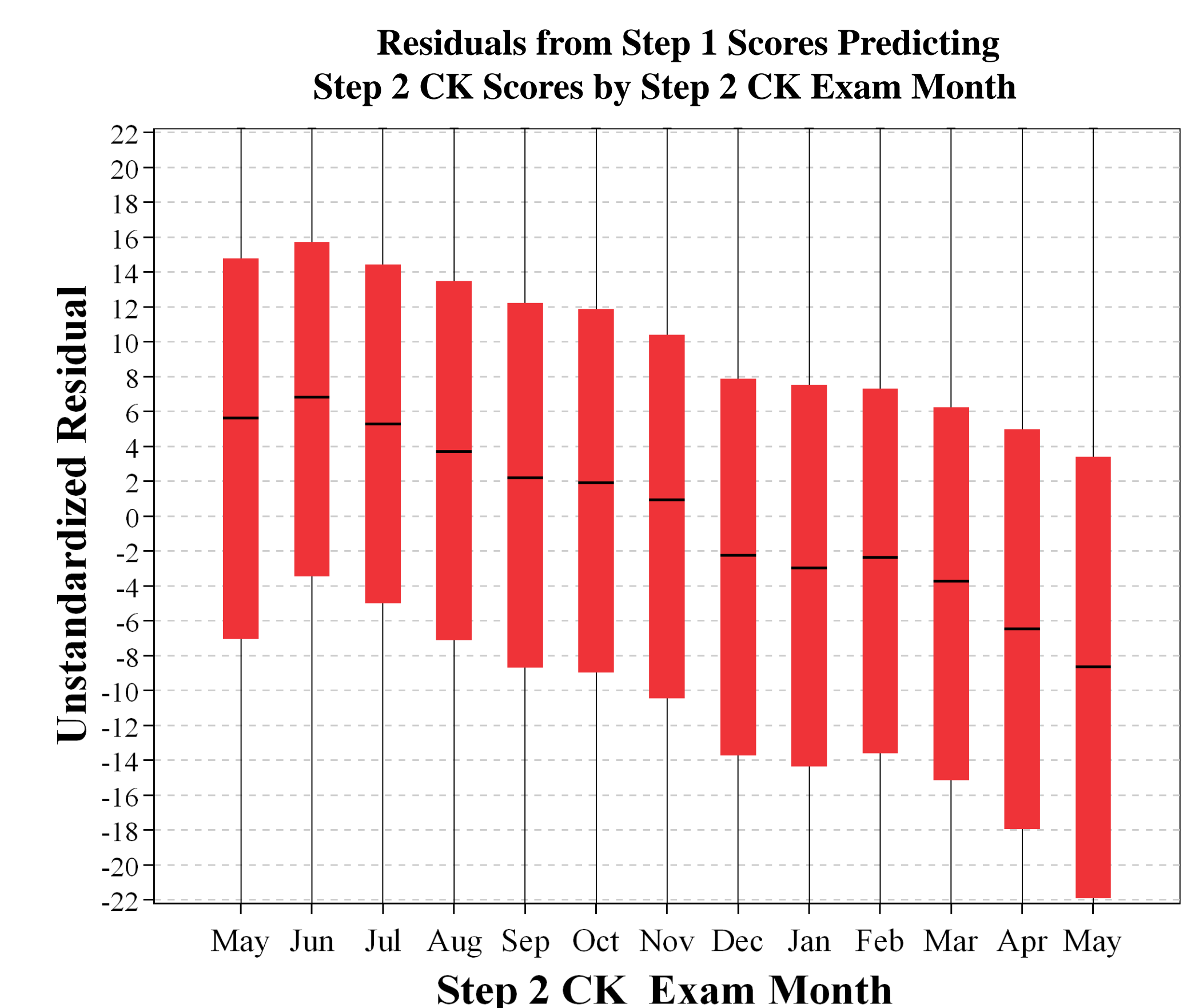
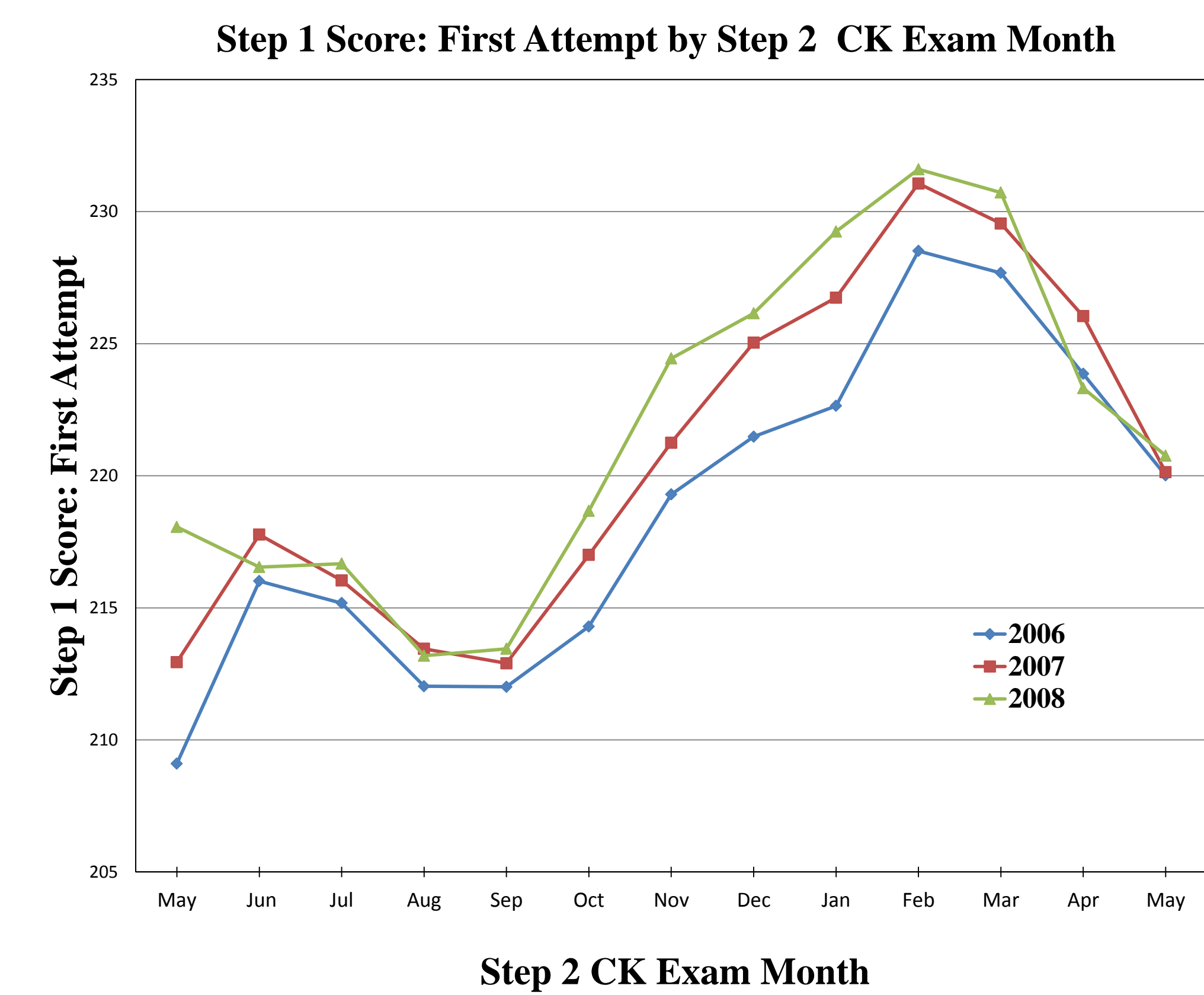
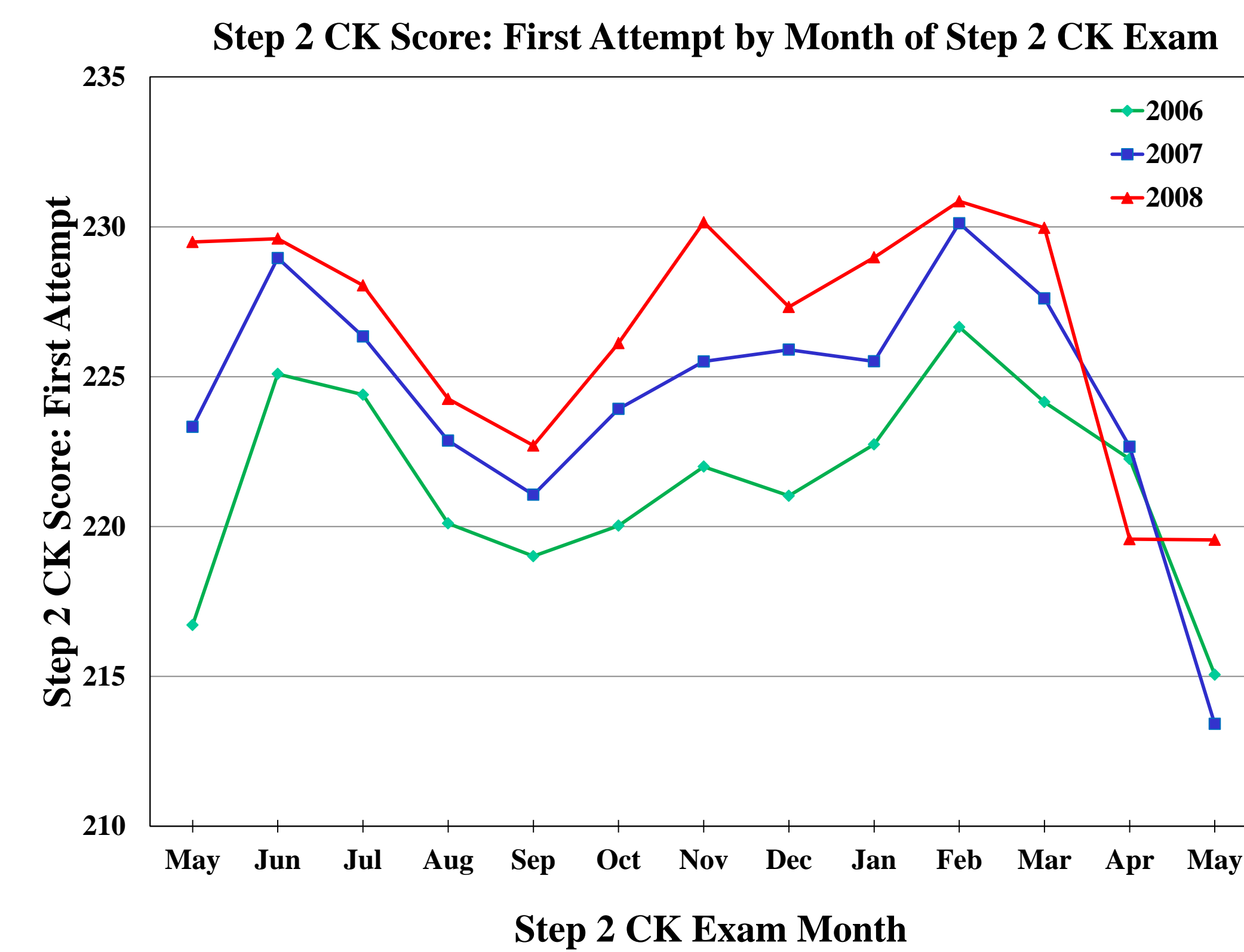
**Analyses:** Descriptive statistics including means, standard deviations of Step 1 and Step 2 CK scores by year and by month Step 2 CK was taken by each examinee; data for 2006, 2007 and 2008 were similar, thus the data were combined. Regression analyses predicting Step 2 CK scores based on Step 1 scores and by month Step 2 CK was administered were performed. Residuals of Step 1 scores predicting Step 2 CK scores were plotted by month Step 2 CK was taken. Three time frames for taking Step 2 CK were defined; very highly motivated to perform well on the examination (influencing interview invitation and ranking) May-September; moderately motivated to perform well (influencing ranking only) October-December; and less motivated to perform well (no influence on invitation to interview or on ranking) January-May. Regression equations were plotted for the three time frames of Step 1 scores predicting Step 2 CK scores. Multinomial regression analysis was performed to plot predictive probabilities for taking Step 2 CK in one of the three specified time periods based on Step 1 scores. The Step 1 scores were a covariate in this analysis.

### Results

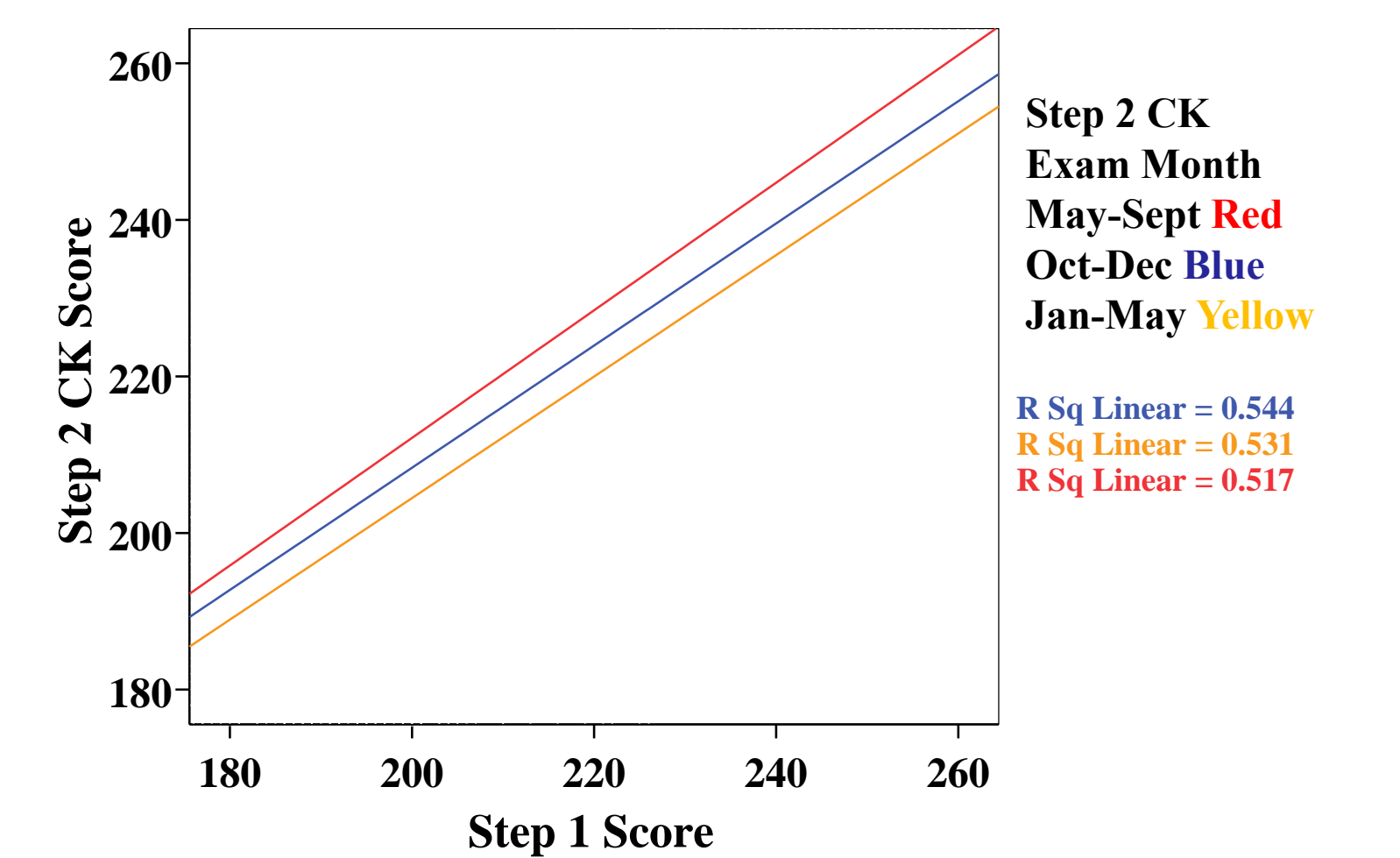
|                      | 2006   | 2007   | 2008   | Total  |
|----------------------|--------|--------|--------|--------|
| Step 1 Mean Score    | 217.7  | 219.3  | 219.9  | 219.0  |
| SD                   | (22.4) | (21.9) | (21.7) | (20.0) |
| Step 2 CK Mean Score | 221.7  | 224.7  | 226.7  | 224.4  |
| SD                   | (23.3) | (23.4) | (23.2) | (23.3) |

### Mean Scores of Step 1 and Step 2CK by Month Step 2 CK was Taken 2006-2008

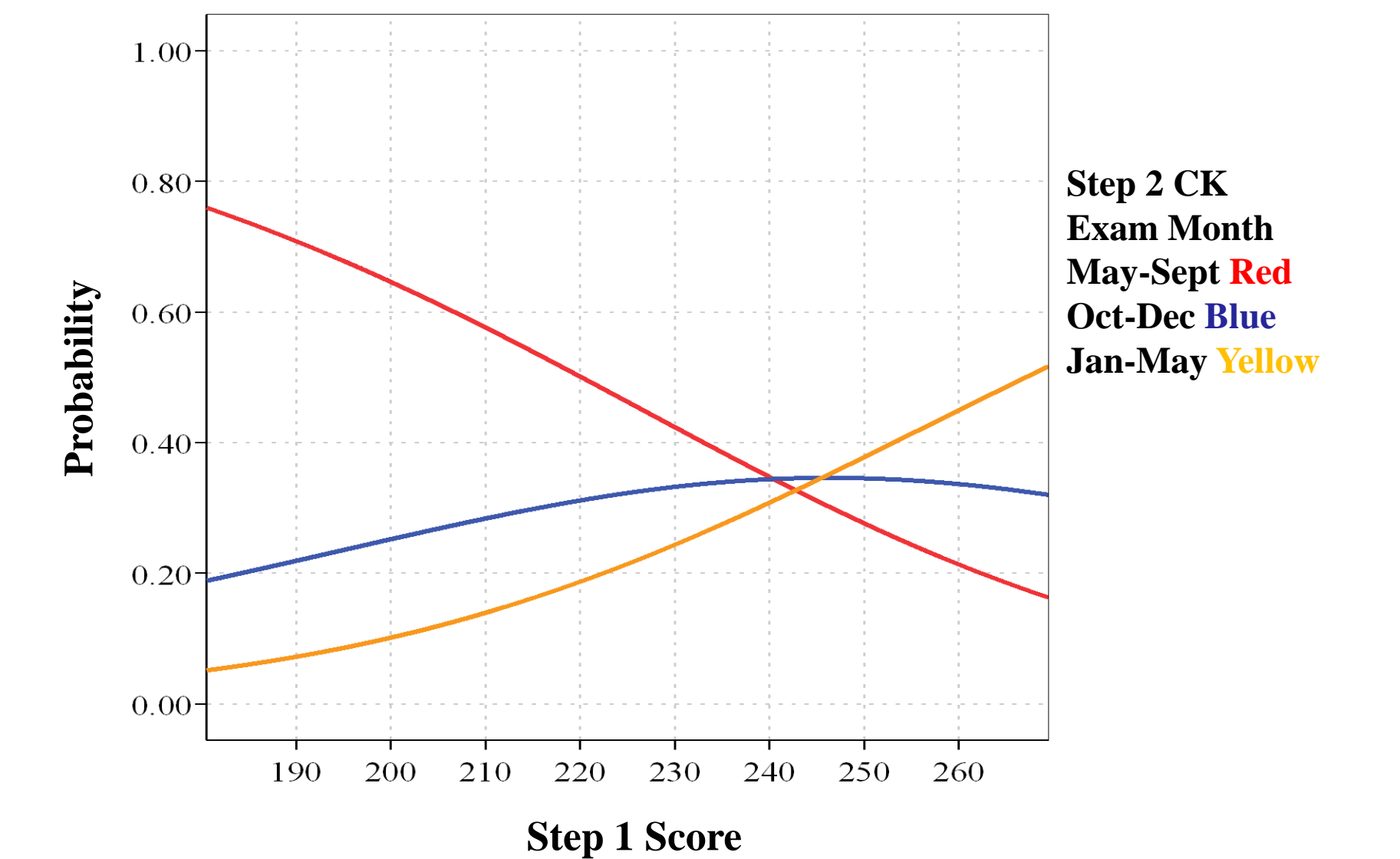
| Month of Step 2 CK | N      | Step 1 |      | Step 2 CK |      |
|--------------------|--------|--------|------|-----------|------|
|                    |        | Score  | SD   | Score     | SD   |
| May                | 273    | 214.1  | 26.2 | 224.2     | 28.6 |
| June               | 1483   | 216.9  | 21.2 | 228.2     | 22.4 |
| July               | 6991   | 216.0  | 18.9 | 226.4     | 21.5 |
| Aug                | 8140   | 212.9  | 19.1 | 222.6     | 22.0 |
| Sept               | 6535   | 212.8  | 20.6 | 220.9     | 23.1 |
| Oct                | 5419   | 216.6  | 21.8 | 223.3     | 23.6 |
| Nov                | 4168   | 221.6  | 22.3 | 225.8     | 23.9 |
| Dec                | 5331   | 224.2  | 23.3 | 224.7     | 24.5 |
| Jan                | 2357   | 226.0  | 23.1 | 225.5     | 24.7 |
| Feb                | 2910   | 230.3  | 21.8 | 229.1     | 23.4 |
| March              | 3040   | 229.2  | 22.0 | 227.1     | 23.4 |
| April              | 1387   | 224.4  | 24.0 | 221.7     | 24.7 |
| May                | 596    | 220.2  | 25.3 | 215.5     | 26.5 |
| Totals             | 48,630 | 219.0  | 22.0 | 224.4     | 23.3 |



Step 1 Scores Predicting Step 2 CK Scores by Exam Time Period



Probability of Taking Step 2 CK by Step 1 Score per Exam Period



Step 1 scores predicting Step 2 CK scores:

Variance Explained:  $R^2 = 0.517$ .

Step 1 scores + month of Step 2 CK administration predicting Step 2 CK scores: Variance explained:  $R^2 = 0.534$

### CONCLUSIONS AND IMPLICATIONS

Students taking Step 2 CK in May-September score significantly higher than students taking Step 2 CK in January-May when accounting for pre-existing differences in ability, as measured by Step 1. Motivation to perform better to positively influence the residency process may be a factor in this difference. If medical schools develop policies requiring students to take Step 2 CK before January, there may be an upward shift in Step 2 CK scores. Of note, recently there has been an increase in Step 2 CK scores that exceeded what would be expected based on Step 1 scores. The higher than expected increase in Step 2 CK scores may be explained if the percentage of medical students taking Step 2 CK earlier in the year has increased. Future research should include the impact of specialty choice and institution of residency (competitive vs. not as competitive) on Step 1 scores predicting Step 2 CK scores by the month Step 2 CK is taken.

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