Supplemental Instruction

Impact on Course Performance
Fall 2007

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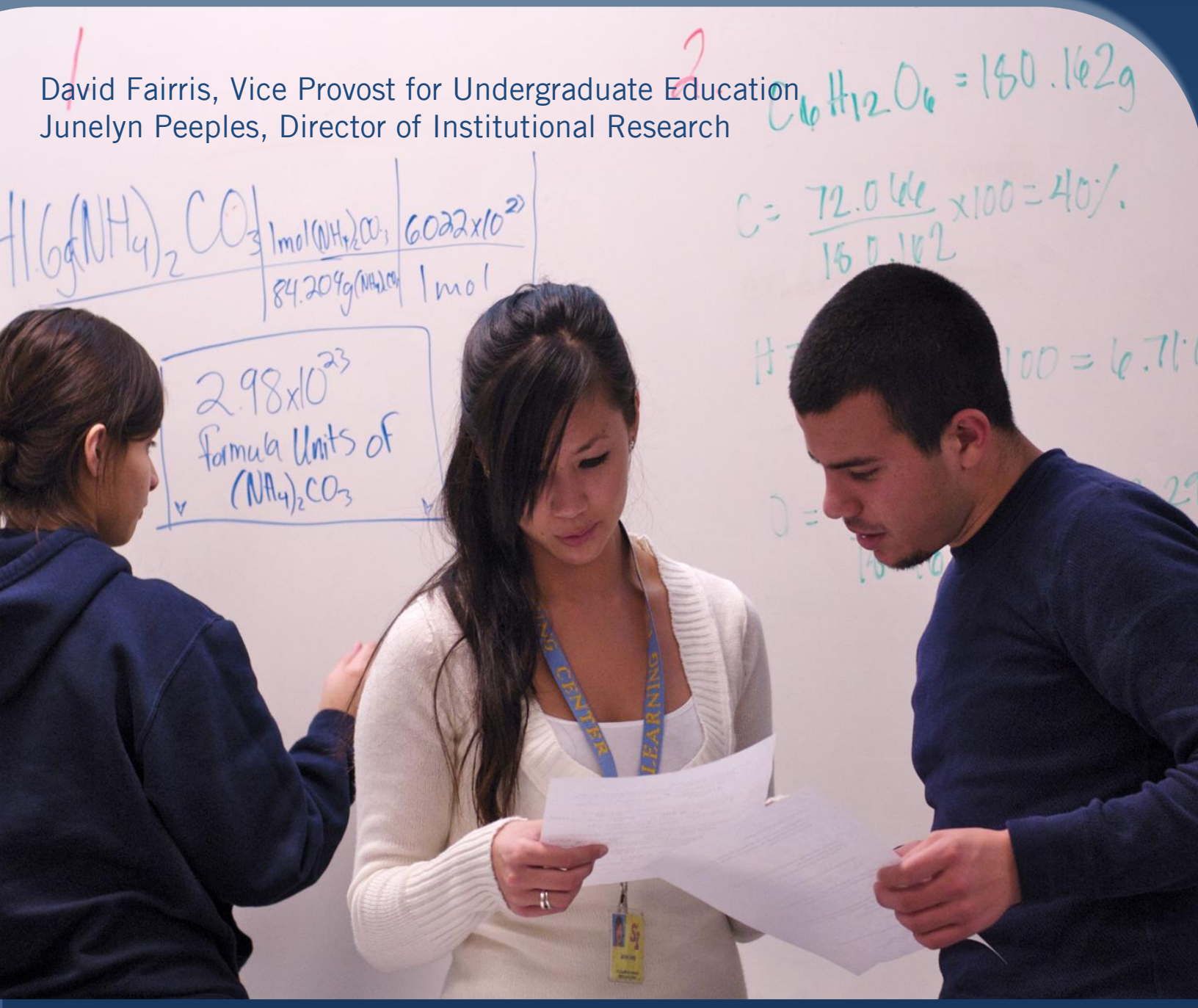

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Undergraduate Education Institutional Research Report

Introduction

The fall 2007 Supplemental Instruction (SI) program evaluation is a follow-up to last year's analysis. SI provides academic support to students who are enrolled in large lecture courses where there are high rates of D and F grades. Previous analysis of the impact of SI on academic performance suggests that the program allows students to achieve significantly higher grades in SI courses than they would otherwise receive in the program's absence. This fall 2007 SI program evaluation is modeled after the initial report entitled *Supplemental Instruction: Impact on Academic Course Performance, Fall 2006 Participants* (Fairris, Peeples, & Son, 2008). To view the report and obtain detailed information regarding the basic evaluation methodology, please go to www.irue.ucr.edu/reports/html .

Results

The participation rate in SI increased by nearly fifteen percentage points in fall 2007 (29.0% vs. 14.0% in 2006) and provided support to 11 additional new courses, while continuing support in selected courses that offered SI during the previous academic year. Table 1 lists all the courses SI offered support to in fall 2007. Descriptive statistics for each group can be found in Table 2. Table 3 provides the course effect of participating in SI for fall 2007. **The results show that the average course effect remains very similar to that found in the 2006 findings – approximately one-third of a grade point.**

Table 5 reports the average participation rate, participation contact hours, and participation effect for each course SI supported in fall 2007. The results reveal that, just as last year, participation in SI offered in the math and science courses was much higher than for courses in the humanities and social sciences. Supplemental Instruction in Biology 5A, Chemistry 1A, and Math 5 and 8A has a positive and statistically significant impact on grade performance for participants in 2007, just as it did in 2006. Interestingly, SI in Chemistry 112A, Math 4, and Psychology 1 courses did not result in significantly higher grades in the 2006, but did in 2007. This is a very positive development, and may be due to improved coordination between SI leaders and faculty in these courses. New courses supported by SI in fall 2007 were Chemistry 112C, Economics 3 and 4, Math 9C and 23, and all yielded statistically significantly higher course grades for participants.

Conclusion

In conclusion, this follow-up evaluation of the Supplemental Instruction program shows that students who participate in SI can positively affect their course grade. One year later, SI continues to benefit students who participate, with both higher course grades for participants and growing numbers of participants compared to last year.

Table 1: Variable Definitions

Course Grade	End of fall term grade received: A+/A = 4.00, A- = 3.70, B+ = 3.30, B = 3.00 . . . . S = 2.00, and F = 0.00
Supplemental Instruction Participant (SIP)	1 if participated; 0 otherwise
Contact Hours (HRS)	Number of hours a student attended an S.I. session
Gender	1 if female; 0 if male
African American	1 if African American; 0 else
Native American	1 if Native American; 0 else
Hispanic	1 if Hispanic; 0 else
Asian/P.I.	1 if Asian/P.I.; 0 else
Caucasian	1 if Caucasian; 0 else
Other	1 if Other; 0 else
Freshman	1 if Freshmen; 0 else
Sophomore	1 if Sophomore; 0 else
Junior	1 if Junior; 0 else
Senior/5th yr+	1 if Senior/5th yr+; 0 else
CHASS	1 if CHASS; 0 otherwise
CNAS	1 if CNAS; 0 otherwise
BCOE	1 if BCOE; 0 otherwise
First-Generation Status	1 if either Parent Education LE no 4-yr degree received; 0 GE 4-yr degree or higher
Low-Income Status	1 if Parental Income LE $30K; 0 otherwise
High School GPA	GPA score
SAT Verbal	SAT Verbal score
SAT Math	SAT Math score
Biology 5A	1 if fall course enrolled in Biology 5A; 0 otherwise
Biology 5B	1 if fall course enrolled in Biology 5B; 0 otherwise
Chemistry 1A	1 if fall course enrolled in Chemistry 1A; 0 otherwise
Chemistry 1C	1 if fall course enrolled in Chemistry 1C; 0 otherwise
Chemistry 112A	1 if fall course enrolled in Chemistry 112A; 0 otherwise
Chemistry 112C	1 if fall course enrolled in Chemistry 112C; 0 otherwise
Economics 3	1 if fall course enrolled in Economics 3; 0 otherwise
Economics 4	1 if fall course enrolled in Economics 4; 0 otherwise
Economics 123	1 if fall course enrolled in Economics 123; 0 otherwise

Table 1: Variable Definitions

History 20	1 if fall course enrolled in History 20; 0 otherwise
Math 4	1 if fall course enrolled in Math 4; 0 otherwise
Math 5	1 if fall course enrolled in Math 5; 0 otherwise
Math 8A	1 if fall course enrolled in Math 8A; 0 otherwise
Math 8B	1 if fall course enrolled in Math 8B; 0 otherwise
Math 9A	1 if fall course enrolled in Math 9A; 0 otherwise
Math 9B	1 if fall course enrolled in Math 9B; 0 otherwise
Math 9C	1 if fall course enrolled in Math 9C; 0 otherwise
Math 23	1 if fall course enrolled in Math 23; 0 otherwise
Math 113	1 if fall course enrolled in Math 113; 0 otherwise
Math 131	1 if fall course enrolled in Math 131; 0 otherwise
Philosophy 7	1 if fall course enrolled in Philosophy 7; 0 otherwise
Physics 2A	1 if fall course enrolled in Physics 2A; 0 otherwise
Physics 2B	1 if fall course enrolled in Physics 2B; 0 otherwise
Physics 40A	1 if fall course enrolled in Physics 40A; 0 otherwise
Physics 40C	1 if fall course enrolled in Physics 40C; 0 otherwise
Psychology 1	1 if fall course enrolled in Psychology 1; 0 otherwise

Table 2: Descriptive Statistics, Mean (Std. Dev.)

	SIP Mean (Std. Dev.)	Non - SIP Mean (Std. Dev.)
Course Grade	2.43 (1.07)	2.17 (1.18)
Gender	0.52 (0.50)	0.49 (0.50)
African American	0.09 (0.28)	0.07 (0.25)
Native American	0.00 (0.05)	0.00 (0.05)
Hispanic	0.23 (0.42)	0.24 (0.43)
Asian/P.I.	0.54 (0.50)	0.50 (0.50)
Caucasian	0.12 (0.33)	0.16 (0.37)
Other	0.02 (0.15)	0.02 (0.15)
Freshman	0.58 (0.49)	0.53 (0.50)
Sophomore	0.30 (0.46)	0.33 (0.47)
Junior	0.10 (0.31)	0.11 (0.31)
Senior/5th yr+	0.02 (0.13)	0.04 (0.19)
CHASS	0.15 (0.36)	0.39 (0.49)
CNAS	0.68 (0.47)	0.49 (0.50)
BCOE	0.17 (0.38)	0.12 (0.32)
First-Generation Status	0.47 (0.50)	0.50 (0.50)
Low-Income Status	0.40 (0.49)	0.41 (0.49)
On Campus	0.44 (0.50)	0.37 (0.48)
High School GPA	3.48 (0.36)	3.43 (0.38)
SAT Verbal	495 (82.20)	509 (84.06)
SAT Math	545 (86.82)	559 (93.00)
Biology 5A	0.07 (0.25)	0.06 (0.24)
Biology 5C	0.04 (0.21)	0.04 (0.19)
Chemistry 1A	0.18 (0.38)	0.08 (0.26)
Chemistry 1C	0.05 (0.22)	0.03 (0.17)

Table 2: Descriptive Statistics, Mean (Std. Dev.)

	SIP Mean (Std. Dev.)	Non - SIP Mean (Std. Dev.)
Chemistry 112A	0.06 (0.24)	0.05 (0.21)
Chemistry 112C	0.03 (0.17)	0.02 (0.13)
Economics 3	0.03 (0.17)	0.05 (0.22)
Economics 4	0.01 (0.07)	0.05 (0.21)
Economics 123	0.00 (0.06)	0.01 (0.08)
History 20	0.07 (0.26)	0.10 (0.29)
Math 4	0.02 (0.14)	0.07 (0.25)
Math 5	0.06 (0.23)	0.08 (0.27)
Math 8A	0.05 (0.22)	0.03 (0.18)
Math 8B	0.06 (0.23)	0.03 (0.18)
Math 9A	0.09 (0.30)	0.04 (0.19)
Math 9B	0.04 (0.19)	0.06 (0.23)
Math 9C	0.02 (0.15)	0.02 (0.15)
Math 23	0.00 (0.06)	0.01 (0.10)
Math 113	0.00 (0.00)	0.00 (0.06)
Math 131	0.00 (0.05)	0.00 (0.04)
Philosophy 7	0.00 (0.06)	0.02 (0.14)
Physics 2A	0.05 (0.21)	0.04 (0.21)
Physics 2B	0.02 (0.14)	0.01 (0.12)
Physics 40A	0.01 (0.12)	0.02 (0.15)
Physics 40C	0.00 (0.06)	0.02 (0.13)
Psychology 1	0.03 (0.17)	0.07 (0.25)

Table 2.1: Descriptive Statistics, Mean (Std. Dev.)

	SIP Mean (Std. Dev.)
Gender = 1 (Female)	0.30 (0.46)
Gender = 0 (Male)	0.27 (0.45)
African American	0.33 (0.47)
Native American	0.25 (0.44)
Hispanic	0.27 (0.45)
Asian/P.I.	0.30 (0.46)
Caucasian	0.24 (0.43)
Other	0.31 (0.46)
Freshman	0.31 (0.46)
Sophomore	0.27 (0.44)
Junior	0.28 (0.45)
Senior/5th yr+	0.15 (0.36
CHASS	0.13 (0.34)
CNAS	0.36 (0.48)
BCOE	0.37 (0.48)

Table 3: Course Grade Regression (SIP)

	^ B (Std. Error)	^ B (Std. Error)	^ B (Std. Error)
SIP	0.26* (0.03)	0.27* (0.03)	0.32* (0.03)
Gender		-0.07* (0.03)	-0.11* (0.03)
African American		-0.07 (0.09)	-0.10 (0.09)
Native American		0.02 (0.23)	0.04 (0.22)
Hispanic		-0.08 (0.08)	-0.10 (0.08)
Asian/P.I.		-0.03 (0.08)	-0.03 (0.08)
Caucasian		0.15 (0.08)	0.13 (0.08)
Freshman		-0.16* (0.07)	-0.15* (0.08)
Sophomore		-0.09 (0.07)	-0.08 (0.07)
Junior		-0.07 (0.08)	-0.04 (0.08)
High School GPA		0.75* (0.03)	0.78* (0.00)
SAT Verbal		0.00 (0.00)	0.00 (0.00)
SAT Math		0.00* (0.00)	0.00* (0.00)
First-Generation Status		-0.04 (0.03)	-0.02 (0.03)
Low-Income Status		-0.08 (0.03)	-0.08* (0.03)
On Campus		0.15 (0.03)	0.16* (0.03)
Biology 5A			-0.12 (0.07)
Biology 5C			-0.24* (0.08)
Chemistry 1A			-0.08 (0.06)
Chemistry 1C			-0.10 (0.08)
Chemistry 112A			-0.36* (0.08)
Chemistry 112C			-0.03 (0.10)

Table 3: Course Grade Regression (SIP)

	^ B (Std. Error)	^ B (Std. Error)	^ B (Std. Error)
Economics 3			-0.11 (0.07)
Economics 4			0.42* (0.08)
Economics 123			0.06 (0.17)
History 20			0.52* (0.06)
Math 4			0.06 (0.07)
Math 5			-0.34* (0.07)
Math 8A			-0.12 (0.08)
Math 8B			-0.62* (0.08)
Math 9A			-0.08 (0.07)
Math 9B			-0.19* (0.07)
Math 9C			-0.52* (0.09)
Math 23			-0.15 (0.14)
Math 113			-0.49* (0.23)
Math 131			0.28 (0.25)
Philosophy 7			0.40* (0.11)
Physics 2A			0.40* (0.08)
Physics 2B			-0.24* (0.11)
Physics 40A			-0.41* (0.10)
Physics 40C			-0.35* (0.12)
Constant	2.17* (0.02)	-1.74* (0.18)	-1.94* (0.18)

* Indicates statistically significant at the 0.05 level (two-tailed).

Table 4: Course Grade Regression (SIP HRS)

	^ B (Std. Error)	^ B (Std. Error)	^ B (Std. Error)
SIP HRS	0.02* (0.00)	0.02* (0.00)	0.03* (0.00)
Gender		-0.01 (0.04)	-0.05 (0.04)
African American		-0.06 (0.15)	-0.04 (0.14)
Native American		-1.32* (0.42)	-1.19* (0.40)
Hispanic		-0.11 (0.14)	-0.06 (0.13)
Asian/P.I.		-0.00 (0.13)	0.02 (0.13)
Caucasian		0.23 (0.14)	0.24 (0.14)
Freshman		-0.36* (0.16)	-0.30 (0.18)
Sophomore		-0.39* (0.16)	-0.34* (0.17)
Junior		-0.37* (0.17)	-0.31 (0.18)
High School GPA		0.60* (0.06)	0.60* (0.06)
SAT Verbal		0.00 (0.00)	0.00 (0.00)
SAT Math		0.00* (0.00)	0.00* (0.00)
First-Generation Status		-0.03 (0.05)	-0.03 (0.04)
Low-Income Status		-0.03 (0.05)	-0.04 (0.05)
On Campus		-0.00 (0.05)	0.00 (0.05)
Biology 5A			-0.13 (0.14)
Biology 5C			-0.46* (0.16)
Chemistry 1A			-0.20 (0.13)
Chemistry 1C			0.03 (0.15)
Chemistry 112A			-0.45* (0.15)

Table 4: Course Grade Regression (SIP HRS)

	^ B (Std. Error)	^ B (Std. Error)	^ B (Std. Error)
Chemistry 112C			0.09 (0.17)
Economics 3			0.00 (0.16)
Economics 4			0.40 (0.29)
Economics 123			0.23 (0.38)
History 20			0.34* (0.14)
Math 4			0.31 (0.18)
Math 5			-0.41* (0.14)
Math 8A			-0.24 (0.15)
Math 8B			-0.76* (0.14)
Math 9A			0.01 (0.13)
Math 9B			-0.36 (0.15)
Math 9C			-0.30 (0.17)
Math 23			0.73* (0.35)
Math 131			0.61 (0.41)
Philosophy 7			0.17 (0.33)
Physics 2A			0.36* (0.15)
Physics 2B			-0.37 (0.19)
Physics 40A			-0.44* (0.20)
Physics 40C			-0.81* (0.32)
Constant	2.31* (0.03)	-1.31* (0.32)	-1.29* (0.34)

* Indicates statistically significant at the 0.05 level (two-tailed).

Table 5: Individual Courses (SIP)

	$\overline{SIP}$ (Std. Dev.)	$\overline{HRS}$ (Std. Dev.)	$\hat{B}(SIP)$ (Std. Error)
Biology 5A	0.30 (0.46)	2.86 (3.18)	0.34* (0.09)
Biology 5C	0.31 (0.46)	3.63 (3.43)	-0.05 (0.10)
Chemistry 1A	0.48 (0.50)	4.46 (4.36)	0.20* (0.08)
Chemistry 1C	0.40 (0.49)	3.26 (3.05)	0.49* (0.09)
Chemistry 112A	0.35 (0.48)	5.64 (4.74)	0.24* (0.09)
Chemistry 112C	0.38 (0.49)	4.06 (2.73)	0.29* (0.09)
Economics 3	0.19 (0.39)	2.35 (1.69)	0.59* (0.14)
Economics 4	0.05 (0.22)	1.37 (0.96)	0.31* (0.16)
Economics 123	0.15 (0.36)	2.00 (1.15)	0.05 (0.57)
History 20	0.23 (0.42)	2.04 (2.17)	0.14 (0.08)
Math 4	0.10 (0.31)	1.75 (1.55)	0.43* (0.20)
Math 5	0.22 (0.41)	7.40 (6.24)	0.40* (0.12)
Math 8A	0.38 (0.49)	9.15 (6.56)	0.51* (0.14)
Math 8B	0.41 (0.49)	5.34 (5.97)	0.17 (0.14)
Math 9A	0.45 (0.50)	3.75 (2.70)	0.57* (0.12)
Math 9B	0.21 (0.41)	2.86 (2.62)	0.13 (0.15)
Math 9C	0.29 (0.46)	3.55 (2.78)	0.60* (0.20)
Math 23	0.10 (0.30)	2.60 (2.27)	1.27* (0.51)
Math 113	0.00 (0.00)	1.00 (0.00)	-0.59 (0.54)
Math 131	0.23 (0.43)	1.33 (0.58)	1.09 (0.72)
Philosophy 7	0.07 (0.26)	1.00 -	0.50 (0.37)
Physics 2A	0.30 (0.46)	3.09 (2.92)	0.23* (0.08)

Table 5: Individual Courses (SIP)

	$\overline{SIP}$ (Std. Dev.)	$\overline{HRS}$ (Std. Dev.)	$\hat{B}(SIP)$ (Std. Error)
Physics 2B	0.32 (0.47)	2.21 (1.69)	-0.03 (0.20)
Physics 40A	0.20 (0.40)	2.36 (1.36)	0.13 (0.14)
Physics 40C	0.09 (0.28)	2.20 (1.30)	-0.29 (0.39)
Psychology 1	0.14 (0.34)	1.68 (1.23)	0.42* (0.13)
Entire Sample (N=9,351)	0.28 (0.45)	4.49 (4.66)	

Note: SIP=Supplemental Instruction Participation, HRS= Supplemental Instruction Contact Hours conditional on SIP=1.
* Indicates statistically significant at the 0.05 level (two-tailed).