Impacts of Edmentum's Exact Path on Student Reading Achievement

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Executive Summary

Century Analytics, Inc. conducted a rigorous evaluation of Edmentum's Exact Path to estimate the impact of Exact Path use on student achievement in Reading in Kindergarten through Grade 3. Exact Path is an online educational tool designed to support individualized student instruction. This study's quasi-experimental design (QED), analyses, and measures meet the What Works Clearinghouse (WWC) 4.0 standards needed to achieve a rating of *Meets WWC Group Design Standards with Reservations (*WWC, 2017). This study also meets the Every Student Succeeds Act (ESSA) guidance for *Moderate Evidence* (U.S. Department of Education, 2016).

Two groups of students were compared in this study. Students in the Exact Path intervention group completed at least eight Exact Path lessons between the fall administration and the winter administration of the Exact Path diagnostic assessment. Students in the comparison group completed zero lessons between the two test administrations.

The study established baseline equivalence of the Exact Path group and the comparison group. Both the baseline measure and outcome meet WWC standards for educational outcomes. Data were analyzed using a WWC acceptable analytic approach, and no confounds were present between the intervention and comparison groups.

Analyses revealed statistically significant positive impacts for student usage of Exact Path on reading achievement in Kindergarten through Grade 3. Impacts had effects sizes ranging from 0.07 to 0.19 and improvement indexes ranging from 2.79 to 7.53. Improvement indexes show the expected change in percentile rank for an average comparison student if he or she had been in the intervention group. For example, an improvement index of 7.53 is equivalent to a comparison group student improving from the 50^{th} percentile to better than the 57^{th} percentile.

Results of this study suggest that students who use Exact Path and complete at least eight lessons as assigned by Exact Path will make statistically significant gains in achievement relative to students who do not complete any Exact Path lessons. These results also suggest that Exact Path is targeting the skills that students need to develop in order to improve their reading achievement.

This study is not without limitations. The definition for the Exact Path intervention group focused solely on lesson completion. The study does not shed any light on the potential impact of any other of Exact Path's student resources (e.g., practice tasks, mastery quizzes, progress checks, worksheets) or the impact of Exact Path when integrated into classroom instruction. The narrow definition for the Exact Path intervention group and the lack of any student demographic variables limits the generalizability of the study's findings.

Future research on Exact Path should incorporate a broader definition of student usage in order to estimate the impact of the many student resources available beyond assigned lessons. This research also should include student demographic characteristics to help understand which groups of students may benefit most from Exact Path and to support generalizing study findings.

Future research also should examine the impacts of Exact Path usage at the classroom level. Exact Path is designed to supplement classroom instruction and has many resources available to teachers. The full potential impact of Exact Path cannot be estimate without examining its effects at the classroom level.

Introduction

Edmentum's Exact Path is an online educational tool designed to support individualized student instruction. Exact Path includes a diagnostic assessment, individualized instruction and skill practice, progress checks, and additional supporting resources for students. Exact Path provides students with immediate feedback and adjusts in real time to student progress. Exact Path incorporates a formative assessment approach to monitoring student progress and adjusting instruction.

Exact Path usage begins with an adaptive diagnostic assessment. The diagnostic can be administered in either Mathematics, Reading, and/or Language Arts. The diagnostic assessment is typically administered at least three time per school year (fall, winter, & spring), and results provide each student with an individualized placement on the Exact Path learning progression.

Within each subject area, the learning progression is a continuous sequence of lessons and skills from Kindergarten to high school. The learning sequences are based on national and state content standards in each subject area. Each subject area's learning sequence includes lessons and skills from a number of sub-domains. The number of lessons per subject area and grade level varies but typically range from 20 to 30 per grade.

Students are placed on the learning progression in a subject area in order to address their most significant weakness. Lessons are assigned to students in groups of three or four, with each lesson targeting a specific skill or set of skills. Once placed on the learning path, students work on completing lessons targeted to their achievement level as indicated by their diagnostic results. Each lesson is typically followed by a short quiz to check the student's understanding of the lesson. After completing the lessons for the group of 3-4 skills, students take a progress check to assess their understanding of all the skills in the group. When progress checks are passed (80% correct), students receive a new set of lessons. If progress checks are not passed, students are assigned lessons to support development in needed skills. As students pass the sequential progress checks, they advance to skills and concepts further along the learning progression.

Students typically retake the diagnostic assessment in the winter of each school year. Students receive an updated diagnostic score reflecting their learning growth since the previous diagnostic score. Students are then placed on the learning progression again based on the latest diagnostic score. Depending on the score, students may repeat lessons not yet passed or progress to new lessons and skills further along the learning progression. Students may also be administered the diagnostic assessment in the spring.

Study Purpose

The purpose of this study was to provide a rigorous estimate of the impact of Exact Path use on student achievement in Reading. Rigorous studies of educational interventions and estimates of impacts are needed by state and local education agencies to select and implement interventions that improve academic outcomes for students (U.S. Department of Education, 2016).

The study was designed to meet the What Works Clearinghouse (WWC) 4.0 standards for quasi-experimental designs (QED) necessary to achieve a rating of *Meets WWC Group Design Standards with Reservations* (WWC, 2017). In meeting WWC standards, the study also was designed to meet the

requirements of the Every Student Succeeds Act (ESSA) guidance for *Moderate Evidence* (U.S. Department of Education, 2016).

The study aimed to estimate the effects of student usage of Exact Path. Usage included administration of the diagnostic assessment, placement of students to the learning progression, and completion of lessons according to the learning progression placement.

Research Questions

The following research question guided the design and analyses used in this study.

> What is the impact of Exact Path usage between the Fall diagnostic and Winter diagnostic assessment on student Reading achievement in Kindergarten through 8th grade relative to students who do not use Exact Path?

Methods

Data

Century Analytics obtained student data from Edmentum to conduct the study. These data included unique student identifiers, student grade level, identifiers for subject area, Exact Path diagnostic scores from the fall and winter in each subject area, and detailed information on the Exact Path skills completed, progress checks, and time spent on lesson activities for all subject areas and domains within subject area. The study used data on the Fall diagnostic score as the baseline measure and scores on the Winter diagnostic as the outcome measure. Students were identified for the intervention and comparison groups based on lesson completion between the fall and winter administrations of the diagnostic assessment. No student demographic variables were available for analysis.

Design

This study used a quasi-experimental design in order to meet WWC (4.0) standards with reservations. According to the WWC, a quasi-experimental design (QED) uses a non-random process to form the intervention and comparison conditions (WWC, 2017). The WWC allows groups to be formed using a variety of methods as long as the groups are mutually exclusive. That is, units (e.g., students or schools) can only be analyzed as a member of a single group. Further, in a QED, the WWC accepts assignment to the intervention based on observed characteristics. Assignment to study conditions for this study was conducted at the student level.

The intervention group was defined as students who had both Fall and Winter Exact Path diagnostic assessment scores and who also completed at least eight lessons within the Reading subject area. That is, for Reading, students needed to complete at least eight lessons within the four sub-domains of Reading (Reading Foundations, Language and Vocabulary, Reading Literature, and Reading Informational Text). A minimum of eight lessons was chosen as the definition for Exact Path implementation after discussion between Century Analytics and Edmentum staff for the following reasons.

First, lessons are assigned in groups of three to four. Using eight lessons helps ensure that students are working their way through the learning progression and are using Exact Path as intended. That is, completing a set of lessons, taking a progress check, and moving further along the learning progression.

Second, between 27-34 skills per grade are provided for the Reading subject area in Kindergarten to Grade 8. This means approximately 15-16 lessons represent one semester's worth of learning on the learning progression. Given the study examined student achievement from the Fall diagnostic to the Winter diagnostic, a minimum of eight lessons was deemed to be a reasonable amount of Exact Path use.

The number of lessons completed by students in the Exact Path intervention group varied (see Appendix A for details). No maximum number of lessons completed was set for inclusion into the intervention group. Approximately 50% of students completed between 8 and 12 lessons. Although data were available for students in Grades 9 through 12, Exact Path usage was not sufficient among students at these grade levels to form intervention groups; only 12 students across Grades 9 through 12 met the intervention group definition.

Comparison group students were those who had both Fall and Winter Exact Path diagnostic assessment scores and who completed 0 lessons within the Reading subject area during the study period. This definition helps ensure that students in the comparison group were not using Exact Path as intended: to address weaknesses in their reading achievement as identified by the diagnostic assessment. This definition of the comparison group also insures that no students were included in both groups for the analyses. In other words, the study groups were mutually exclusive.

Outcomes

Student achievement, both at baseline (fall) and follow-up (winter) was measured using Exact Path's diagnostic assessment. The Reading diagnostic is an adaptive assessment of varying length depending on student performance and assesses reading achievement in four domains (Reading Foundations, Language and Vocabulary, Reading Literature, Reading Informational Text). The diagnostic has an average of 48 items per grade level—with fewer items at Kindergarten—and typically requires between 15 to 60 minutes to complete (Edmentum, 2017). Scores from the assessment are on a vertical scale that runs from Kindergarten to high school. Scores are provided for the entire subject area and for each domain within subject area. Internal reliabilities for the winter administration of the diagnostic in Reading range from .78 for Kindergarten to .95 for Grades 4 through 8.

The diagnostic assessment meets the WWC standards for outcomes in terms of validity and reliability. Because the diagnostic assessment measures content aligned to national and state standards it is not over-aligned to the Exact Path intervention.

Baseline Equivalence

In order to meet WWC standards with reservation for a QED, baseline equivalence must be established for the analytic samples of the intervention (Exact Path) and comparison groups. In addition, baseline equivalence needs to be established separately for each grade level included in the analyses. Finally, baseline equivalence must be established using a measure that meets WWC standards.

Baseline equivalence was established using the Exact Path Fall diagnostic scores. As described above in the Outcomes section, the Exact Path diagnostic assessment meets WWC standards for baseline and outcome measures.

To establish the study groups, students were first identified who met the definitions of the intervention and comparison groups described above. Once these samples were identified, descriptive statistics on the baseline measure (Fall diagnostic scores) were produced for each group by grade level. Using these descriptive statistics, each grade level was checked for baseline equivalence of the originally identified samples.

Only the samples from Kindergarten through Grade 2 had baseline differences that were under the WWC threshold for baseline equivalence (i.e., ≤ 0.25 standard deviation) using the WWC method for calculating baseline differences (WWC, 2017). The Grade 3 sample was close to the WWC threshold (-0.36), but the samples for Grades 4 through 8 were three to four times over the threshold (see Appendix B).

Further examination of the baseline differences between the intervention (Exact Path) and comparison groups reveals an interesting difference between the primary grades (Kindergarten through Grade 3) and the upper grades (Grade 4 through 8). In the primary grades, the intervention group, while still lower in average achievement than the comparison group, had achievement scores that were at or near grade level. In the upper grades, the intervention group had achievement scores that were one or more grade levels below. For example, the intervention group in Grade 7 had a mean achievement of 995.45. This is below the comparison group average achievement at Grade 4 of 1053.65. These data suggest the Grade 7 intervention sample is approximately 3 or more grade levels behind.

This pattern in the upper grades suggests that teachers and schools are using Exact Path to provide remedial reading instruction. Comparison students on the other hand, those students who completed 0 Exact Path lessons, are likely to be on-grade level students who don't need instructional remediation in reading and are receiving regular classroom instruction in reading.

Given these differences in scores between the intervention and comparison sample in the upper grade levels, it is reasonable to assume these samples of students represent different populations of students: those reading at grade level and not needing remedial instruction in reading and those reading far below grade level and needing remedial instruction. Although matching techniques could be attempted to create baseline equivalent samples for these upper grades, the matching would not resolve any potential population differences between the samples. Given that comparing students from different populations is not accepted by the WWC (WWC, 2014), impact analyses were restricted to Kindergarten through Grade 3.

The original Grade 3 sample was slightly over the WWC threshold for baseline equivalence (standardized mean difference of -0.36). The mean of the original intervention group (907.86), however, was still near the expected level for on-grade achievement. These data suggest that the Grade 3 intervention group does not represent a different population than the Grade 3 comparison group. Given these data, the decision was made to create matched groups.

Propensity score matching was used to match intervention and comparison students in Grade 3. The logistic regression propensity score model used the fall Reading diagnostic score as the matching variable, and nearest neighbor matching was conducted. The matching resulted in the two groups having a baseline difference (-0.04) under the WWC threshold (Appendix B.) The number of students in the matched Grade 3 sample completing Exact Path lessons is show in Appendix A.

Analyses and Results

Data were analyzed to estimate differences between intervention and comparison groups on the outcome (i.e., Winter diagnostic score). Impact analyses were conducted level using the following linear regression model fit to the data separately for each grade level.

$$Y_i = \beta_0 + \beta_1(\text{TREAT})_i + \beta_2(\text{BASE})_i + e_i$$

Where: Y_i is student *i*'s Winter Reading diagnostic score. β_0 is the regression adjusted comparison group mean. β_1 is the adjusted mean difference between the intervention and comparison groups, and TREAT represents the group status of student *i* coded as 0 = comparison and 1 = intervention. β_2 is the regression slope for the baseline (fall) diagnostic score. BASE is student *i*'s baseline diagnostic score in reading, and e_i is the residual for student *i*.

Impact analyses yielded statistically significant positive impacts for all grade levels tested in Reading (Table 1). Detailed output from the regression analyses are provided in Appendix C. Adjusted mean differences between the intervention and comparison groups ranged from 8.98 for Grade 3 to 18.86 for Grade 2. These differences translate into effect sizes ranging from 0.07 for Grade 3 to 0.19 for Grade 2.

Table 1. Impacts on Reading.

	N	Mean	SD	Adjusted Mean Difference (SE)	Pooled Standard Deviation	Effect Size	Improve Index
Kindergarten							
Comparison	686	766.50	91.46	13.78*	90.71	0.15	5.96
Intervention	252	780.28	88.61	(6.10)			
Grade 1							
Comparison	756	836.48	94.01	15.12***	89.55	0.17	6.75
Intervention	971	851.60	85.93	(3.66)			
Grade 2							
Comparison	534	886.10	109.32	18.86***	98.13	0.19	7.53
Intervention	1405	904.96	93.53	(3.54)			
Grade 3							
Comparison	559	973.22	129.22	8.98***	126.58	0.07	2.79
Intervention	559	982.21	123.88	(4.45)			

SE = Standard error
Improve Index = Improvement Index
* = *p*-value < .05
*** = *p*-value < .001

In addition to translating the impacts of Exact Path into effect sizes, the improvement index is another useful method to aid in the interpretation of the practical importance of impacts. The improvement index represents the difference in percentile rank at the mean (i.e., the 50th percentile) between the intervention group and the comparison group (WWC, 2017). The improvement index shows the expected change in percentile rank for an average comparison student if he or she had received the intervention.

Percentile improvements for Exact Path usage in reading ranged from 2.79 for Grade 3 to 7.53 for Grade 2. An improvement index of 7.53 is equivalent to a comparison student improving from the 50th percentile to better than the 57th percentile.

Summary

This study was conducted at the level of rigor needed to meet WWC standards with reservations (WWC, 2017). Baseline equivalence was established between the Exact Path intervention group and the comparison group. The measure used to establish baseline equivalence and as the reading achievement outcome meet WWC standards for validity and reliability. The baseline and outcome measures are aligned to national and state academic content standards and so are not over-aligned to the Exact Path intervention. The study had no confounds.

The study also meets criteria set forth by the Every Students Succeeds Act (U.S. Department of Education, 2016). The Department of Education considers a quasi-experimental study to be "well-designed and well-implemented" if it receives a *Meets WWC Design Standards with Reservations* rating or is of equal quality (U.S. Department of Education, 2016). The study also meets the ESSA criteria for statistically significant positive effects. These two aspects of the study mean it qualifies as providing Moderate evidence (Level 2) of Exact Path's effectiveness.

Exact Path had a statistically significant impact on student reading achievement at every grade level analyzed. These impacts occurred between the fall and winter administrations of the diagnostic assessment. Students who met the definition for the Exact Path intervention—completion of at least eight lessons between the Fall and Winter diagnostic assessments—showed greater gains in reading achievement than students who completed zero Exact Path lessons. Additional lesson completion over the entire school year would likely result in a greater impact on student reading achievement.

The results of this study suggest that students who use Exact Path and complete lessons on the learning progression assigned to them by Exact Path will make gains in achievement relative to students who do not complete any lessons. The statistically significant gains made by students in the Exact Path intervention group over those students in the comparison group also suggest that Exact Path lessons are targeting skills students need to develop in order to improve their achievement. Had Exact Path targeted skills students already had mastered, it is likely students wouldn't have seen the same gains in achievement between administrations of the diagnostic assessment. These results suggest a practical impact and importance of Exact Path usage and completion of at least eight lessons.

The data on lesson completion in Appendix A show that many students in the Exact Path intervention group completed more than eight lessons. Approximately 50% of students completed between 8 and 12 lessons. As prior research has shown, Exact Path usage is positively correlated with achievement as measured by the diagnostic assessment (Edmentum, 2018). Although not addressed in this study, an increase in the number of Exact Path lessons completed likely results in increases in scores on the diagnostic assessment.

Limitations

This study is not without limitations. This study used a focused definition for the intervention group: students who had completed at least eight lessons on the Exact Path learning progression. But Exact Path is much more than lessons, and Exact Path usage involves much more than lesson completion.

Once placed on the learning progression, Exact Path provides students with a variety of resources to support their learning. These resources include practice tasks, mastery quizzes, progress checks, worksheets, videos, etc. Although the students included in the Exact Path intervention group for this study likely used these resources, this study did not estimate the impact of using these resources on student reading achievement.

This study used a design sufficient to meet WWC standards with reservations. The Exact Path intervention students and comparison students were equivalent at baseline (Fall diagnostic administration) on reading achievement. Students' fall reading scores were used as a statistical adjustment for estimating impacts on reading. No other student characteristics, however, were included in the study. The lack of student demographic characteristics limits the generalizability of the study results. It is unclear from this study what types of student were included in the intervention group or if students of differing backgrounds experienced differing impacts from Exact Path usage.

This study assigned students to the intervention and comparison groups. Exact Path usage typically differs by students, so using students as the unit of assignment is appropriate. Exact Path, however, also has many resources available to teachers and is designed to supplement and be integrated into regular classroom instruction. Teachers can use Exact Path to assign students lessons in areas of need, group students by ability—even by domains within a subject area—for focused instruction, and view multiple reports on student progress and achievement. All of these Exact Path teacher and classroom resources are likely to affect classroom practice and instruction, and therefore likely to affect student achievement. This study, however, was unable to estimate the impacts of teacher use of Exact Path on classroom level student achievement.

This study used a rigorous quasi-experimental design (QED) that is acceptable to meet WWC standards with reservations. Along with the statistically significant positive impacts, this study meets ESSA Level 2 standards. That said, this study was unable to control for student characteristics other than baseline (fall) achievement. It is possible that other student or classroom characteristics are responsible for the difference in achievement between the Exact Path intervention and comparison groups.

This study is also limited by the lack of any implementation fidelity data. Other than the completion of eight or more lessons, no information on Exact Path usage was included in this study. Although this study shows statistically significant positive impacts on student achievement from the completion of eight or more lessons, this study was unable to estimate the impact of any other aspects of student usage of Exact Path.

Further Research

This study provides a rigorous estimate of the impact of student completion of Exact Path lessons on student achievement in reading. Additional research is needed to understand how other aspects of Exact Path usage impact student achievement. This future research also should consider addressing the limitations of this study. In addition to including student demographic characteristic as part of future analyses, further research also should examine other aspects of student usage and how these might impact student achievement. These could include student use of worksheets, additional lessons, practice tasks, and videos.

Perhaps the greatest opportunity for better understanding the impacts of Exact Path usage are at the classroom level. Exact Path provides many resources to support classroom instruction. The current study

did not examine the impact of any of these. This means Exact Path's full impact might be underestimated in this study. A study at the classroom level would likely provide a much more complete estimate of the impact of Exact Path usage on student achievement. Any study conducted at the classroom level also should use demographic data on classrooms and schools included in the study.

Although the baseline and outcome measures used in this study meet WWC standards, a future study that examines the impact of Exact Path on broader and policy relevant outcomes would provide potential users with important information as they consider which educational intervention to adopt and as they prepare their students for high-stakes testing and, more importantly, college and career.

A truly unbiased estimate of Exact Path's impact can only be provided by a random controlled trial (RCT). In this type of study, students or classrooms are randomly assigned to either use Exact Path or conduct business as usual, creating two groups that are equivalent in expectation on all characteristics, known and unknown. This equivalence means any difference in achievement between the study groups can be attributed to Exact Path usage. A well-conducted RCT eliminates the possibility that differences between intervention and comparison groups are caused by differences in characteristics rather than the intervention itself, a limitation of the present study.

Finally, studies of an intervention's impact are best conducted in parallel with studies of implementation fidelity. Findings from the two types of study complement each other and aid in the interpretation of results. Studies of implementation fidelity inform the impact research by aiding in the definition of intervention groups and communicating to the research audience what level of usage resulted in the impacts. Studies of impact inform implementation research by estimating impacts at different levels of implementation and helping to focus on how much usage is needed to produce statistically significant and meaningful increases in student achievement.

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Appendix A
Exact Path Reading Lessons Completed

Table A.1. Number of students in the intervention group completing Reading lessons by grade level.

Lessons completed	K	Grade 1	Grade 2	Grade 3	Grade 3 matched	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
8 lessons	35	140	167	198	95	171	132	118	78	108
9 lessons	38	88	116	122	54	106	83	76	66	55
10 lessons	36	99	146	133	52	92	79	56	43	54
11 lessons	47	95	101	120	49	89	67	50	39	49
12 lessons	10	39	87	96	33	64	43	47	48	22
13 lessons	7	54	80	87	39	71	54	35	29	30
14 lessons	11	43	63	71	28	57	47	31	35	37
15 lessons	5	30	62	82	31	37	34	28	16	20
16 lessons	7	30	44	57	18	34	27	21	17	18
17 lessons	12	38	51	65	22	35	38	26	7	12
18 lessons	6	25	30	27	8	34	34	22	15	9
19 lessons	4	31	35	40	13	17	20	12	13	7
20 lessons	4	16	45	53	15	34	13	14	10	14
21 or more lessons	30	243	378	382	102	248	189	129	79	74
Total students	252	971	1,405	1,533	559	1,089	860	665	495	509

K = Kindergarten

Appendix B
Baseline Equivalence

Table B.1. Baseline equivalence in Reading by grade level.

Grade Level	N	Mean	SD	Difference	Pooled Standard Deviation	Effect Size
Kindergarten						
Comparison	686	754.55	90.71	-21.04	87.12	-0.24
Intervention	252	733.50	76.50			
Grade 1						
Comparison	756	807.18	89.54	-10.24	83.14	-0.12
Intervention	971	796.94	77.80			
Grade 2						
Comparison	534	860.96	106.12	5.32	90.67	0.06
Intervention	1405	866.28	84.06			
Grade 3 before matching						
Comparison	559	948.12	129.69	-40.25	110.92	-0.36
Intervention	1533	907.86	103.24			
Grade 3 after matching						
Comparison	559	948.12	129.69	-4.84	125.81	-0.04
Intervention	559	943.28	121.81			
Grade 4						
Comparison	752	1053.65	133.73	-108.32	121.50	-0.89
Intervention	1089	945.29	112.28			
Grade 5						
Comparison	1055	1090.16	135.00	-123.39	132.42	-0.93
Intervention	860	966.72	129.19			
Grade 6						
Comparison	1350	1126.74	124.09	-136.06	124.55	-1.09
Intervention	665	990.63	125.46			
Grade 7						
Comparison	1340	1129.00	124.10	-133.49	124.07	-1.08
Intervention	495	995.45	123.97			
Grade 8						
Comparison	1271	1153.58	118.44	-109.75	127.03	-0.86
Intervention	509	1043.78	146.33			

Appendix C
Regression Analysis Output

Table C.1. Kindergarten Estimates of Regression Coefficients

Parameter	Coefficient	Std. Error	*t* value	*p*-value	95% Conf. Int.	
Exact Path	13.7796	6.0980	2.26	0.024	1.8123	25.7468
Fall diagnostic	0.4386	0.0309	14.2	0.000	0.3780	0.4992
Intercept	435.5624	23.5118	18.53	0.000	389.4205	481.7044

Std. Error = standard error
95% Conf. Int. = 95% confidence interval

Table C.2. Grade 1 Estimates of Regression Coefficients

Parameter	Coefficient	Std. Error	*t* value	*p*-value	95% Conf. Int.	
Exact Path	15.1198	3.6626	4.13	0.000	7.9362	22.3034
Fall diagnostic	0.5821	0.0218	26.67	0.000	0.5393	0.6249
Intercept	366.6208	17.8297	20.56	0.000	331.6507	401.5908

Std. Error = standard error
95% Conf. Int. = 95% confidence interval

Table C.3. Grade 2 Estimates of Regression Coefficients

Parameter	Coefficient	Std. Error	*t* value	*p*-value	95% Conf. Int.	
Exact Path	18.8589	3.5421	5.32	0.000	11.9123	25.8056
Fall diagnostic	0.7625	0.0175	43.69	0.000	0.7283	0.7967
Intercept	229.6106	15.3267	14.98	0.000	199.5520	259.6693

Std. Error = standard error
95% Conf. Int. = 95% confidence interval

Table C.4. Grade 3 Estimates of Regression Coefficients

Parameter	Coefficient	Std. Error	*t* value	*p*-value	95% Conf. Int.	
Exact Path	8.9839	4.4548	2.02	0.044	0.2432	17.7245
Fall diagnostic	0.8138	0.0177	45.93	0.000	0.7791	0.8486
Intercept	201.6296	17.0902	11.80	0.000	168.0970	235.1622

Std. Error = standard error
95% Conf. Int. = 95% confidence interval

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