Primary Grade Students’ Achievement Given Differentiated Process Writing Instruction in a Summer Learning Program

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Primary Grade Students' Achievement Given Differentiated Process Writing Instruction in a Summer Learning Program.

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Abstract  
Struggling writers often need more instructional support than is present in commercially available process writing curricula. In this study, we employed a one-group, pretest–posttest design to evaluate whether 41 struggling primary grade writers who attended a university-based summer learning program would increase in writing ability, given a commercially available process writing unit
differentiated to provide more support. A Teachers College Reading and Writing Project (TCRWP) unit was modified for use in the program: The content was streamlined, the volume of writing was reduced, the instructional explicitness was strengthened, increased feedback and student product goals were integrated, and the instruction was small group. We analyzed the data by students' entering level of intervention need (i.e., Tier 3, Tier 2) as determined by Written Expression Curriculum-Based Measurement (WE-CBM) Correct Writing Sequences (CWS) scores. Students who entered at Tier 2 level (N = 8) showed significant mean gains on the TCRWP On-Demand Performance Assessment and CWS assessment. Their pretest and posttest Test of Early Written Language-3 (TEWL-3) scores were comparable. Students who entered at Tier 3 level (N = 33) showed significant mean gains on all assessments. Analyses of progress relative to CWS end-of-year performance targets revealed five of eight Tier 2 students scored within Tier 1 at posttest. Three continued to score within Tier 2. Three Tier 3 students scored within Tier 1 level at posttest. Eighteen scored within Tier 2. Twelve continued to score within Tier 3. We discuss the findings in relation to the need for tiered support for writing instruction.

**Keywords**
Writing; Writing instruction; Process writing instruction; Struggling writers; Differentiated instruction

**Supplementary Information**
The online version contains supplementary material available at https://doi.org/10.1007/s10643-021-01278-y.

**Introduction**
It is important to develop writing ability. It is critical for educational and professional advancement in a rapidly changing, information-driven economy and civic participation (National Assessment Governing Board,). Many students, however, have difficulty learning to write. In the United States, approximately three-quarters of students fail to write with grade level proficiency (National Center for Education Statistics,). That so many children are failing to learn to write with proficiency is deeply concerning. Summer learning programs have long been contexts for helping children gain academic ground, most often in reading and math. In the study reported here, we explored the potential for children to accelerate their writing achievement. We added an hour of daily writing instruction to a university-based summer reading program for primary grade children. To frame the study, we first review summer learning program outcomes. Then, we address children's difficulties with writing and writing instruction. Following, we relate the study.

**Summer Learning Outcomes**
Cooper et al. produced an extensive meta-analytic and narrative review of 93 evaluations of K-12 summer programs. They asked two questions: What are the overall effects of summer school on children and adolescents, and What does research say needs to be done to make the most of summer school? The outcome measures in the studies reviewed targeted math, reading, English, language, spelling, vocabulary, and general achievement. A single study measured writing. Cooper et al. reported high confidence in several conclusions. First, programs focused on remediating deficiencies and accelerating learning both positively impacted achievement. Students completing programs that
targeted deficiencies could be expected to score about one-fifth of a standard deviation higher than control students on outcome measures. Those completing programs focused on accelerating learning could be expected to achieve roughly the same outcome. Second, programs produce significant effects for students. Third, smaller programs produce larger effects, likely because they can tailor instruction to local needs. Finally, programs that include individual or small group instruction produce the greatest impact. While an important synthesis of the research in summer programming, Cooper et al. noted that approximately two-thirds of the studies were single-group pretest–posttest designs and so offered limited ability to provide evidence of effectiveness.

In the last decade, the Rand Corporation (Augustine et al.,) conducted a randomized controlled trial (RCT) of five school district level voluntary summer programs for elementary students that provided additional causal evidence for summer learning programs. The goal was to determine whether such programs improved student achievement. Programs admitted children for two summers. Programming was five days a week for at least five weeks. Classes had no more than 15 students. Children who attended at least 20 days scored significantly better than control students on state math tests in the fall and spring of the school year following the first summer of participation. They scored comparably to control students in English language arts. Students with high attendance in the second summer of the program, however, scored significantly better than control students in both math and English language arts in the fall and spring. McEachin et al. summarized the characteristics of effective programs gleaned from the RCT: consistent attendance, small class sizes, instruction aligned with students' needs, teachers with grade-level and subject-matter experience, research-based practices, and sufficient duration.

The instruction associated with some of the programs that Cooper et al., reviewed and those involved with the Rand RCT may have included some attention to writing. However, writing outcomes were not a research interest. Given students' lack of writing proficiency, writing seems an area for specific focus in summer programs.

Children's Writing Difficulties
Children who struggle with writing find many aspects challenging. They have less knowledge about how to write and the features of good writing than peers who are more skilled in writing (Englert et al.,). They have difficulties identifying audiences for whom to write and generating content to communicate (Fulk & Stormont-Spurgin,). Their writing tends to be short, incomplete, and poorly organized (Englert & Raphael,). They typically engage in little planning (Rodriguez et al.,). Rather, their writing is more knowledge-telling (Scardamalia & Bereiter,), meaning they search their long-term memories for knowledge related to the assignment and transcribe it as text with each transcribed thought prompting the next memory search and transcription. Language mechanics and usage difficulties are also challenges (Grünke & Leonard-Zabel,). Troia identified factors contributing to writing difficulties, among them insufficient time for writing and unsupportive curriculum materials.

Effective Writing Instruction
Graham and his colleagues (Graham, McKeown, et al.,) conducted a meta-analysis of the writing intervention literature to identify effective practices with elementary students. They analyzed 115 studies, placed them in treatment categories, and calculated weighted average effect sizes for specific
writing interventions. For all interventions but grammar, they found the average weighted effect sizes were positive and statistically greater than 0. The interventions per category with average weighted effect sizes were as follows: explicit teaching of skills, processes, or knowledge [strategy instruction, 1.02; Self-Regulated Strategy Development (SRSD) instruction, 1.17; Non-SRSD strategy instruction, 0.59; text structure instruction, 0.59; creative/imagery instruction, 0.70; transcription skills, 0.55; grammar, − 0.41]; scaffolding writing (prewriting, 0.54; peer assistance, 0.89; product goals, 0.76; adult/peer assessment/feedback, 0.42); other writing activities (extra writing time, 0.30, comprehensive writing programs, 0.42); and use of a process approach to writing, 0.40. Based on these findings, Graham, McKeown, et al. recommended several practices. Those that targeted the primary grades included teaching strategies for planning, drafting, and revising writing; teaching text structures; engaging students in gathering and organizing ideas prior to writing; creating instructional arrangements where students can work collaboratively to plan, draft, revise, and edit their writing; and building in opportunities for peer and teacher assessment with feedback.

The Process Approach to Writing

While process approaches to writing instruction vary (Pritchard & Honeycutt,), all approaches reflect the notion that students learn to write through writing rather than by completing decontextualized exercises. Further, all approaches involve students in generating ideas, organizing their thinking, drafting, and revising their writing over time with opportunities for teacher and peer feedback (Richardson,). Often, they are characterized by limited teacher explanations, with the instruction primarily occurring in mini-lessons and incidentally during brief conferences (Boscolo,). Graham and Perin operationalized process writing approaches as those involving "extended opportunities for writing; writing for real audiences; engaging in cycles of planning, translating, and reviewing; personal responsibility and ownership of writing projects; high levels of student interactions and creation of a supportive writing environment; self-reflection and evaluation; personalized individual assistance and instruction; and in some instances more systematic instruction" (p. 449).

To investigate for whom process writing instruction was effective, Graham and Sandmel conducted a meta-analysis of 29 K-12 studies of students' writing outcomes given the approach. They found that process writing instruction significantly improved general education students' writing relative to other forms of instruction but not that of struggling or at-risk writers. Despite the evidence that process writing instruction was insufficiently robust to improve all students' writing, Graham and Sandmel noted the likelihood that it would remain prominent given commercially available curricula. They recommended that teachers integrate other effective practices with it.

The Current Study

Substantial percentages of primary grade teachers use process writing instruction (Cutler & Graham). Moreover, school districts often adopt commercially available process writing curricula to meet state standards (McCarthey & Ro). Yet, students who struggle with writing need more support than process writing instruction offers (Graham & Sandmel). The purpose of the current study was to evaluate whether the struggling primary grade writers who attended a university-based summer learning program would increase their writing achievement given participation in a unit from a commercially available process writing curriculum that was differentiated to provide more support.
Differentiation

Tomlinson and Imbeau related that when teachers differentiate, they engage in a process that involves monitoring students' progress and then modifying the curriculum, instructional methods, learning activities, or work products to address students' needs. Educators can modify four aspects of a curriculum (content, process, product, affect) in light of three categories of student variation (readiness, interest, learning profile).

Empirical evidence supports differentiation. Deunck et al., reviewed 21 studies of differentiation in primary grade math and reading instruction. They identified a small positive effect ($d = + 0.146$) in academic performance and noted the effect size was more pronounced when schools embedded the differentiation within broader reform efforts ($d = + 0.296$). Two studies not included in the meta-analysis were Goddard and her colleagues' (Goddard et al.,). They surveyed teachers in 95 Michigan schools and collected reading and math achievement data from the state's database. They found that school norms associated with differentiation were significantly related to achievement differences (Goddard et al.,) and differentiation predicted achievement (Goddard et al.,).

In the area of writing, differentiation is critical given the complexity of the writing process (McKeown et al.,). Traga Philippakos and FitzPatrick offered a framework for such differentiation. In the model, all students would participate in Tier 1 evidence-based classroom writing instruction. This would include more explicit small group instruction for students in need of more support. If students do not meet expectations after participating in two evidence-based writing interventions, teachers would refer them for diagnostic assessment followed by Tier 2 writing instruction.

The Differentiated Unit

The unit used with modifications was Calkins et al.'s "Small Moments: Writing with Focus, Details, and Dialogue." It is a first-grade unit in the Teachers College Reading and Writing Project's (TCRWP) Units of Study curriculum. It focuses on personal narrative writing. We selected it because it targets early primary grade learners, the level at which most of the summer program students have worked over the years, and because all children have stories from their lives to draw upon. A small moment story is a story about a single experience. The third author, a literacy specialist with considerable experience with the TCRWP curriculum, modified the content, products, and instructional processes to differentiate the unit. We summarize the differentiation below.

First, the content was reduced. The unit-as-designed has 21 sessions. In the summer program, there were 15 sessions available for instruction. The third author identified the most important content to cover: the nature of a small moment story, planning a small moment story, engaging in a writing routine, crafting an interesting setting, adding details and dialogue, creating an engaging ending, and revising and editing the story. She drew from multiple sessions in the unit-as-designed to create sessions focused on this central content. We share the adapted unit as Supplementary Information.

Second, the volume of writing was reduced. In the unit-as-designed, students complete three to four small moment story booklets per week. The third author thought this was too much for the summer program students, given her experience with TCRWP curricula and struggling writers. Hence, she reduced the number of booklets expected to one per week, with one revised, edited, and published small moment story booklet by the end of the program.
Third, as the explicit teaching of writing skills, processes, or knowledge is an effective practice (Graham, McKeown, et al.), the third author increased the level of explicitness. She adjusted the language so that teachers directly explained concepts and processes when explanations were absent in the unit or indirectly communicated. Two examples are below.

A unit goal is for students to include details in their stories. To introduce this goal, the curriculum has teachers read aloud from George McClements' *Night of the Veggie Monster* and then say to students: It's a great story, isn't it? Did you notice the details? That's what writers do when they write Small Moment stories. They take just a small thing that happened, and they write what happened first, next, and next, telling it with details. I'm going to read a part of the story again, and this time listen for the details that help you picture what happened. (Calkins et al., p. 4)

Teachers reread the text, have students listen for details and share them. The teacher does not explain what details are. The third author modified the lesson so that teachers directly explained what a detail is. She also used a different mentor text: A detail is a small piece of descriptive information that helps a reader see, hear, or feel what is happening. In *Short Cut*, Donald Crews wrote, 'We should have taken the road. But it was late, and it was getting dark, so we started down the track.' He gave us two details, that it was late and it was getting dark. These help us see and understand what was happening.

In a later lesson, the third author modified the process students would engage in during a partner-share. The lesson-as-designed has the following language: Right now, to see how your story sounds, will you read it to a partner and show him or her where in it you revised? You might want to use the narrative writing checklist to point to specific revisions you made. (Calkins et al., p. 150)

Following the sharing, the lesson-as-designed continues: Now that you listened to what your partner did to revise his or her story, think of what else you think your partner can add or change to make the story even better for the reader. Did you hear feelings, people talking, the exact actions of what people were doing with their bodies? Use our class charts and our narrative writing checklist if you need help and make a plan for tomorrow. (Calkins et al., p. 150)

The third author modified the lesson so that students' responsibilities were clearer and narrowed the focus to adding details: Your partner is going to read your story aloud. Your job is to listen to see if you included details that help a reader see, hear, and feel what is happening. After the story is read, you have two jobs. First, tell your partner the details you heard. Then, ask your partner if there is something else you might add so a reader can more fully experience what is happening. You'll write those suggestions on a Post-it.

Fourth, the grouping structure was altered. The TCRWP designed the unit for use in a regular classroom writing workshop. In that context, for most of the time, students work independently or with a partner at a distance from the teacher. In the summer program, all instruction was small group.

**Professional Development**

The summer program PD was grounded in Desimone and Garet's conceptual framework for effective PD. The framework identifies five features that characterize successful PD: a focus on subject matter knowledge and how students learn it, active learning opportunities, coherence with curricular goals and other improvement efforts, sustained duration (i.e., ongoing with 20 or more contact hours), and
the collective participation of teachers who share a grade, school, or department. Multiple studies associated with large federally-sponsored initiatives have provided support for these features. Garet et al., found that Eisenhower Professional Development Program PD incorporating the features was associated with gains in teachers' knowledge, skills, and self-reports of classroom practice. Desimone et al., found that Eisenhower PD focused on specific practices increased teachers' use of those practices and that active learning opportunities increased PD's effectiveness. Working with National Science Foundation Local Systemic Change Through Teacher Enhancement Initiative data, Heck et al., found that participation in PD incorporating the features was positively related to teachers' attitudes, perceptions of preparedness, and reports of practice. Gersten et al., found that teachers in Reading First schools who participated in PD including the features scored 0.86 and 0.58 standard deviations higher than control teachers on instructional measures and significantly outperformed control teachers on a vocabulary knowledge measure.

With these features and findings in mind, the third author engaged the teachers in 30 PD hours. To build teachers' curricular knowledge, prior to the program's start, she involved them in two days of PD in the TCRWP approach to process writing, the workshop's structure, component workshop activities, and how she differentiated the unit to provide more support to children. As part of this initial PD, she had the teachers discuss their teaching and learning experiences with the TCRWP curriculum and writing instruction more generally. In this way, in addition to building teachers' knowledge, these two days developed rapport within the group. Weekly, the third author met with the teachers as a group for two hours. These sessions were grounded in the active learning opportunities Desimone and Garet identified: opportunities to observe, receive feedback, analyze student work, or make presentations. The third author modeled upcoming lessons so the teachers could observe their implementation and think through potential instructional issues with support. She also addressed how children's writing develops across time to build teachers' subject matter knowledge of writing. To accomplish this, she drew on students' initial and subsequent small moment stories to illustrate their writing levels within the curriculum and learning progressions relative to aspects of writing emphasized in the curriculum. So that teachers could apply this knowledge, she had those with students who wrote at similar levels collaborate to analyze their students' small moment stories, identify instructional responses, present their analyses and responses to the larger group, and receive feedback from her and others. In addition to the weekly sessions, the third author observed daily in the classrooms to monitor and support teachers as they worked with students. At times during these observations, she entered the instruction to model a technique or language to use when giving feedback or support to children. Following, she met with teachers individually and in small groups to debrief and consult.

Daily Routine
The daily routine maintained the TCRWP workshop structure. Teachers began the instruction with a connection in which they related how the upcoming mini-lesson fit into students' current writing or their lives as writers. They then stated the mini-lesson's purpose. The mini-lessons were longer than in the unit-as-designed by about 10 min. An active engagement component was included within the mini-lesson or followed it. In this component, students practiced what they learned in the mini-lesson or shared something related to the lesson with a partner or the group. The mini-lesson closed with a link to the previous day's lesson, the day's work, or students' lives as writers. An independent writing period followed.
While students wrote, the teachers conferred individually with them. They integrated two practices that Graham, McKeown, et al., identified as effective into conferences, adult feedback and product goals. In TCRWP curricula, teachers provide feedback to individual students. In a classroom with 25–30 students, however, they have fewer opportunities to conference with individuals each week. In the summer program, teachers conferenced with every child daily. They determined a student’s need in the moment and engaged in the more explicit instruction and scaffolded support necessary for the child’s writing growth. As conferences closed, teachers provided specific product goals (e.g., add two details; use dialogue to show what you said). The workshop ended with students sharing their writing with a partner or the group.

Research Questions and Expected Outcomes
The research questions and expected outcomes were as follows:

- Do students make significant gains in writing ability given the differentiated unit? As the unit involved the recommended (Graham, Bollinger, et al.,) hour per day of writing instruction and more support for children, the expectation was that students' posttest scores, on average, would be significantly better than their pretest scores.

- Given the differentiated unit, will students' writing achievement accelerate relative to end-of-year performance targets? Students who struggle with writing are variable in their abilities and needs. Hence, the expectation was that some, but not all, would progress.

Method
Design
This study used a one-group pretest–posttest design to investigate the effectiveness of the differentiated unit.

Setting and Participants
The study took place as part of a university-based summer reading program for primary grade children who read below grade level. The university is located in a large city in the upper Midwest of the United States. The program takes place in the university's literacy center. It provides 60 h of instruction for children and 40 h of PD for teachers. Teachers instruct groups of three to five students in small classrooms. The program runs 9–12:30 Mondays through Fridays for 4 weeks.

The participants were a convenience sample composed of the 41 children who enrolled in the program. They had just completed the first (N = 5), second (N = 25), and third (N = 11) grades. There were 19 boys (1 African American, 17 Latino, 1 Caucasian) and 22 girls (13 African Americans, 9 Latina). Twelve elementary teachers served as instructors, 11 women (10 Caucasian, 1 Asian American) and one man (African American). Nine teachers had five (N = 1), four (N = 1), two (N = 2), and one (N = 5) years of experience, respectively. All but one were primary grade teachers. Three teachers were newly licensed. Their student teaching was in the first (N = 2) and second (N = 1) grades.

Timeline
The timeline for program activities was as follows.
• Professional Development
• Pre-program: 9:00–5:00, Friday and Saturday prior to Monday's program start
• Weekly: 1:00–3:00 one day per week
• Daily: Conferences with individual teachers (3–5 per day)
• Assessment
• Week 1: On-Demand Performance Assessment, TEWL Form A, CWS (Tuesday-Friday)
• Weeks 2 & 3: CWS (daily)
• Week 4: On-Demand Performance Assessment, TEWL Form B, CWS (daily)
• Writing Instruction: 11:00–12:00 daily

Measures
Three assessments served as data, the AIMSweb Written Expression Curriculum-Based Measurement (WE-CBM) (Powell-Smith & Shinn) Correct Writing Sequences (CWS) measure, the Test of Early Written Language-Third Edition (TEWL-3) (Hresko et al.,) Contextual Writing Subtest, and the TCRWP On-Demand Performance Assessment (Calkins,).

Curriculum-based measurements provide standardized, reliable and valid, efficiently administered and scored measures sensitive to growth (Romig et al.,). The AIMSweb WE-CBM (Powell-Smith & Shinn,) is one such set of measures. Students respond in writing to a story starter given a standardized set of directions and time (3 min). A CWS is "two adjacent writing units (words and punctuation) that are correct within the context of what is written" (Powell-Smith & Shinn, p. 11). The measure accounts for syntax, semantics, punctuation, capitalization, and spelling (Hosp et al.,). AIMSweb relies on published reliability and validity information. Investigations have reported an internal consistency reliability of 0.75 (Parker et al.,) and alternate form reliabilities of 0.59 to 0.84 (Weissenburger & Espin,) and 0.66 to 0.85 (Espin et al.,) for CWS. Romig et al., reported mean weighted criterion validities for CWS of 0.56 for Grades K-2 and 0.48 for Grades 3–5.

The TEWL-3 (Hresko et al.,) is a standardized assessment of general writing ability. We used the Contextual Writing subtest as a transfer measure to evaluate whether children would grow more generally in writing ability given the instruction. Children write a story in response to a picture prompt. Stories are scored from 0 to 3 points on 20 items using a rubric for a possible total score of 60. Items address story format, cohesion, thematic maturity, ideation, and story structure. Two forms are provided. Hresko et al. report all internal consistency reliability coefficients meet or exceed 0.90 and that the correlations between the Contextual Writing subtest and criterion measures of written expression are large (Wechsler Individual Achievement Test-2 Written Expression, r = 0.69) and very large (Woodcock-Johnson III Tests of Achievement Broad Written Language, r = 0.75; 6 + 1 Writing Trait Rubric, r = 0.71).

The TCRWP On-Demand Performance Assessment (Calkins,) is the assessment associated with the Units of Study curriculum. It assesses growth relative to aspects of writing addressed in the curriculum. In the "Small Moments" unit, the On-Demand prompt is to write a small moment story from one's life. The scoring rubric targets structure (story beginning/lead, transitions, story ending, organization), development (elaboration, craft), and language conventions (spelling, capitalization, punctuation). Structure and language conventions items are worth 4 points each. Development items are worth 8 points each. Students can earn 44 points (Structure, 16 points; Development, 16 points; Language...
Conventions, 12 points). The rubric provides descriptions of grade-level expectations with point values per item. For example, in the area of structure, if a student shows in words or pictures the first thing that happened in their story (kindergarten expectation), they earn 1 point. If they include the characters and setting (third-grade expectation), they earn 4 points. An assessor scores a student's writing relative to what is present in the writing irrespective of the student's grade level. The TCRWP has not provided reliability or validity information for the assessment.

Procedures
Data Collection and Scoring
The teachers administered WE-CBM daily at the outset of the writing period in their small classrooms. This is more frequent than the once per week recommendation associated with progress monitoring (Hosp et al.,); however, the summer program was only four weeks, and a goal was for the teachers to learn to administer and score WE-CBM. We used students' initial and final writing samples as data. A reading specialist proficient in scoring WE-CBM scored the samples. She was unfamiliar with the writing component of the summer program and the study's purpose. The fourth author scored half the samples to establish interrater reliability. She was not involved in the writing instruction. She was aware that the intent was to increase students' writing ability. Strong interrater reliability was indicated for the initial scores, with an Intraclass Correlation Coefficient (ICC) agreement of 0.99 (95% CI 0.998–0.999).

The teachers administered the TEWL-3 on the first and last days of the program in their small classrooms. Following the program's close, the first and fourth authors each scored all the assessments to establish interrater reliability. The ICC agreement for the initial scores was 0.85 (95% CI 0.760–0.904). Following a discussion of discrepant scores, an interrater agreement of 100% was achieved.

The teachers administered the On-Demand Performance Assessment on the first and second-to-last days of the program in their small classrooms. The third author, the literacy specialist who adapted the Unit of Study, provided the PD, and was familiar with the purpose of the writing instruction and related study, scored the assessments. A second scorer, a literacy specialist with considerable experience with the Units of Study curriculum and assessments and who was unfamiliar with the summer program or the study, scored half the assessments to establish interrater reliability. The ICC agreement for the initial scores was 0.93 (95% CI 0.869–0.963). Following a discussion of discrepant scores, an interrater agreement of 100% was achieved.

Data Analysis
AIMSweb WE-CBM provides cut scores at the 15th and 45th percentiles, per grade level and assessment, that schools can use to identify students' levels of intervention need if they use a Response to Intervention (RTI) framework to organize instruction (Pearson,). The cut score at the 15th percentile distinguishes Tiers 3 and 2, and the value at the 45th percentile distinguishes Tiers 2 and 1. AIMSweb reports that students whose scores fall within Tier 3 will likely require intensive instruction to meet end-of-year performance targets. Those with scores that fall in Tier 2 will likely need only moderate support. They report that the higher cut score can serve as the performance target. Pearson provides an example: Were the CWS cut scores at Grade 2 in the spring of the year 9 and 19, scores in the 0–8 range could be considered Tier 3, and those in the 9–18 range could be considered Tier 2. Those 19 or better could be considered Tier 1. Nineteen could be considered the performance target.
We analyzed the data by students' entering level of intervention need (i.e., Tier 2, Tier 3) as determined by their initial CWS score. Those whose scores fell into the Tier 3 range, given the end-of-year performance target for the grade just completed, we identified as Tier 3 students. Those whose scores were in the Tier 2 range we identified as Tier 2. No student had a score that fell in Tier 1. We identified eight and 33 students as Tier 2 and Tier 3, respectively.

Paired $t$-tests and Wilcoxon Signed Rank Tests were used for the comparisons associated with Research Question 1. Elliott and Woodward noted, "the basic assumption for the paired $t$-test to be valid when you have small sample sizes is that the difference scores are normally distributed" (p. 116). For each group of children (Tier 2, Tier 3) and assessment, Shapiro–Wilk tests were used to check the normality of the differences between pretest and posttest scores. Boxplots were examined to check for outliers among the differences. When the differences did not violate the normality assumption and there were no outliers, paired $t$-tests were used for comparisons. If the normality assumption were violated, or if there were outliers among the differences, Wilcoxon Signed Rank Tests were used because the test reduces the impact of outliers in small samples (Field,). To evaluate achievement relative to the performance targets associated with Research Question 2, children's progress at posttest relative to the three RTI tiers was tallied.

Results

Research Question 1: Comparisons

Descriptive statistics for each of the comparisons for each group of students are provided in Table 1. The results for each group are presented below.

Table 1 Descriptive statistics

<table>
<thead>
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<th>Pretest</th>
<th>Posttest</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>M(SD)</td>
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<tr>
<td>Tier 2 students</td>
<td></td>
<td></td>
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<td>CWS</td>
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<tr>
<td>On-Demand</td>
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<td>11.56</td>
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<td>TEWL-3</td>
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<tr>
<td>On-Demand</td>
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<td>12.07</td>
</tr>
<tr>
<td>TEWL-3</td>
<td>30</td>
<td>34.56</td>
</tr>
</tbody>
</table>

$CWS$ correct writing sequences; $On-Demand$ On Demand Performance Assessment: scoring range 0–44 points; $TEWL-3$ Test of Early Written Language-3: Contextual Writing: scoring range 0–60 points

Tier 2 Students

$CWS$. The Shapiro–Wilk test indicated the data did not significantly depart from normal, $W = 0.89, p = 0.241$. No outliers were identified. The $t$-test revealed that, on average, students' posttest scores were significantly greater than their pretest scores, $t = −2.652, p = 0.033, r = 0.71$.

$TEWL-3$. The Shapiro–Wilk test indicated the data significantly departed from normal, $W = 0.79, p = 0.022$. The Wilcoxon Signed Rank Test revealed students' pretest and posttest scores were comparable, $Z = −0.106, p = 0.916, r = 0.04$. 
On-Demand Performance Assessment. The Shapiro–Wilk test did not show a significant departure from normality, \( W = 0.976, p = 0.940 \). No outliers were identified. The \( t \)-test revealed that, on average, students' posttest scores were significantly greater than their pretest scores, \( t = -5.181, p = 0.001, r = 0.89 \).

Tier 3 Students
CWS. The Shapiro–Wilk test indicated the data did not significantly depart from normal, \( W(33) = 0.94, p = 0.101 \). The box plot revealed an outlier. The Wilcoxon Signed Rank Test revealed students' posttest scores were significantly better than their pretest scores, \( Z = -4.572, p < 0.001, r = 0.83 \).

TEWL-3. The Shapiro–Wilk test indicated the data did not violate the normality assumption, \( W(30) = 0.955, p = 0.234 \). The box plot revealed four outliers. The Wilcoxon Signed Rank Test revealed students' posttest scores were significantly better than their pretest scores, \( Z = -2.317, p = 0.021, r = 0.40 \).

On-Demand Performance Assessment. The Shapiro–Wilk test indicated the data did not violate the normality assumption, \( W(33) = 0.972, p = 0.541 \). No outliers were identified. The \( t \)-test revealed students' posttest scores were significantly greater than their pretest scores, \( t(32) = -6.492, p < 0.001, r = 0.75 \).

Research Question 2: Achievement Relative to Performance Targets
Five of the eight Tier 2 students (62.5%) achieved their end-of-year performance target at posttest, indicating their posttest score met the Tier 1 expectation for their recently completed grade. Three (37.5%) continued to score within Tier 2. Of the 33 Tier 3 students, 18 (54.5%) scored within Tier 2 at posttest. Three (9.1%) scored within Tier 1. Twelve (36.4%) continued to score within Tier 3.

Discussion
This research asked whether students would make significant gains in writing ability given the differentiated unit and whether their achievement would accelerate relative to end-of-year performance targets. As expected, both students identified as Tier 2 and Tier 3 at pretest made significant mean gains in the ability to produce writing samples with more correct writing sequences and significantly better small moment stories. In contrast to expectations, only Tier 3 students showed a significant mean gain in contextual writing ability more generally.

We attribute the mean gains made to the increased instructional intensity that resulted from unit modifications. The more focused content enabled students to allocate their efforts to central understandings about small moment stories and the processes they were engaging in to write them. The small group context enabled teachers to provide a level of monitoring and response to students that could not have been achieved in a regular classroom. In the small groups, the teachers could maintain their awareness of where each student was in their writing on a nearly moment-to-moment basis and intervene in ways that supported each student at the point of need. Further, the increased explicitness built into lessons, the increased feedback in daily conferences, and the daily product goals made concepts, tasks, and expectations clearer to students. The more general improvement of the Tier 3 students likely was due to the greater room for growth among them given the short amount of time. Their Tier 2 peers were better writers from the start and had less room to grow more generally within the program's timeframe. Instead, these students grew significantly in aspects of writing most sensitive
to the instructional target—generating, revising, and editing small moment stories. Despite the mean gains, as expected, the differentiated unit instruction was not sufficient for all students to progress relative to end-of-year performance targets. Three Tier 2 and 12 Tier 3 students (36.5%) showed no progress.

The findings demonstrate the potential and limits of differentiated process writing instruction of the kind explored here to meet the needs of primary grade children who write below grade expectations. Some children, mostly those with moderate needs, can be successful with commercially available process writing curricula of the kind used here provided it is adapted. Other children, largely those in need of more intensive support, likely need another form of instruction.

The findings illustrate the need for the kind of differentiation in writing instruction that Traga Philippakos and FitzPatrick proposed. To review, all students would participate in evidence-based Tier 1 classroom writing instruction. This would include more explicit small group instruction for students in need. Teachers would refer students who do not meet expectations after two evidence-based interventions for diagnostic assessment followed by Tier 2 writing instruction. The summer program instruction reported here reflects the kind of more explicit small group instruction that might happen in a process writing classroom, particularly one that uses the TCRWP curriculum. The summer program was short, so the question remains whether the students who failed to meet performance targets at posttest would do so given another 15-session small group intervention with a second differentiated unit. The students who scored within Tier 2 at posttest might be able to meet performance targets given a second differentiated unit. Those who scored within Tier 3 likely would need the kind of writing instruction that Traga Philippakos and FitzPatrick recommend for students in need of more intensive support in order to meet the targets, instruction designed to teach foundational skills, cognitive strategies, and metacognitive strategies. This kind of instruction is found in the SRSD approach that Graham, McKeown, et al., identified as the most robust form of writing instruction.

Limitations
There are several limitations associated with this study. Like two-thirds of studies in Cooper et al.'s meta-analysis and narrative review, this study was of a one-group, pretest–posttest design. Without a control group that participated in the unit-as-designed, we cannot dismiss the possibility that the students may have made comparable progress without the modifications. The sample size was also small and a convenience sample of volunteer participants, so the results are not representative. Further, while the third author was in the classrooms daily to support and monitor the instruction, and the first author also monitored daily activities, we did not formally monitor fidelity of implementation. Finally, the daily writing CBM may have confounded the results. The additional brief writing practice may have served as an intervention itself, and we cannot rule out the possibility that it influenced children's writing progress.

Implications
A practical implication associated with the differentiated instruction reported here is whether schools would have sufficient personnel to provide the intensive small group instruction required. Summer school programs often have smaller class sizes, so it might be easier for these programs to accommodate the fully small group instruction. With individual and small group instruction a high-
impact summer school practice (Cooper et al.,), it is more likely that summer school programs would account for it in the planning process and hire sufficient personnel.

Conclusion
This research demonstrates the value of including specific writing instruction within academic summer programs, particularly those serving young children. A widely accepted goal is for children to read on grade level by third grade. The demands for skilled writing represented in schooling and employment beyond suggest that writing on grade level by third grade is an equally important goal. The findings reported here suggest that students can make significant gains when the instruction is a good match for their level of need. They also suggest that schools must depart from a one-curriculum-fits-all approach to writing instruction. They demonstrate that, even given an intensive small group intervention with a widely used writing curriculum differentiated to provide more support, many children will not progress. These students need a more robust form of writing instruction.

Supplementary Information
Below is the link to the electronic supplementary material.

Graph: Supplementary file1 (PDF 1369 kb)

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References


