The dissertation of Shawn M. Datchuk was reviewed and approved* by the following:

Richard M. Kubina  
Associate Professor of Special Education  
Dissertation Adviser  
Chair of Committee  

David L. Lee  
Associate Professor of Special Education  

Charles A. Hughes  
Professor of Special Education  

John Dattilo  
Professor of Recreation, Park and Tourism Management  

Spencer Niles  
Department Head of Educational and School Psychology and Special Education  

*Signatures are on file in the Graduate School.
ABSTRACT

The present study used a multiple-baseline, single-case experimental design to investigate effects of three sequential experimental conditions on frequency of correct word sequences (CWS) and construction of simple sentences per 1-minute. Sentence Instruction, Frequency Building to a Performance Criteria (FBPC), and Paragraph Instruction comprised the three experimental conditions. Both Instruction conditions ended upon achieving an accuracy criterion of 90%. The FBPC phase lasted at least 5 sessions and ended when participants achieved a fluency criteria of at least 30 CWS with 0 to 3 incorrect word sequences per 1-minute. Participants completed a descriptive paragraph at the end of each experimental condition to measure application of effects to more complicated, compound tasks. Participants included four adolescents with difficulty constructing simple sentences, three females and one male enrolled in grades 8-10. All participants improved on frequency of sentences per 1-minute. Three of four participants improved CWS per 1-minute. Following instruction and FBPC phases, all participants maintained performance across time and applied higher amounts of CWS and complete simple sentences to descriptive paragraphs. Results extend prior behavioral fluency literature, suggesting acquired, fluent behavior applies to more complicated, compound tasks.
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Each scientist is like a fish scale on the body of a fish, with highly constrained potential for contribution, but whose scale partially overlaps the scales of other scientists. The power for progress in science depends on this overlap, and is vested in the collective product far more so than in the works of any individual scientist.

--William Shadish, paraphrasing Donald Campbell (2007)

Once there were brook trout in the streams in the mountains. You could see them standing in the amber current where the white edges of their fins wimpled softly in the flow...On their backs were vermiculate patterns that were maps of the world in its becoming. Maps and mazes. Of a thing which could not be put back. Not be made right again. In the deep glens where they lived all things were older than man and they hummed of mystery.

--Cormac McCarthy (2006)

To Dr. Stephen Graf, a diver of vigilant spirit in waters shallow and deep.
Chapter 1

Introduction

Written expression has served an important evolutionary function in human history (Diamond, 1999). It remains a primary way to transmit knowledge across distance and time, such as reports of scientific findings or the wisdom of a long extinct culture. Written expression also serves many practical purposes. It allows students to summarize and synthesize academic material and provides an indicator for promotion and salaried employment (National Commission on Writing, 2004).

Unfortunately many students display writing difficulties. Prevalence rates of writing difficulties and disabilities have exceeded rates for reading or math in some samples (Mayes & Calhoun, 2006; 2007; Schuerholz et al., 1995). Students typically developing and with disabilities have shown underwhelming performance on standardized assessment as well. In twelfth-grade, only 5% of students with disabilities and 26% of typically developing students scored proficient or above on the writing subtest of the National Assessment of Educational Progress (U.S. Department of Education Institute of Education Sciences, National Center for Educational Statistics, 2009).

Written expression ranges from sentence level skills, such as spelling, handwriting, and sentence construction, to more complex skills and strategies needed for multiple-paragraph composition (Berninger & Amtmann, 2003). Many students struggle with sentence level skills. During composition, students with writing difficulties construct a low proportion of complete sentences (Bui, Schumaker, & Deshler, 2006; Saddler & Graham, 2005) and commit frequent errors in syntax, punctuation, and
capitalization (Kline, Schumaker, & Deshler, 1991; Newcomer & Barenbaum, 1991). Adolescents who struggle with sentence level skills face an upward challenge. Opportunities for remediation typically decrease from primary to middle and high school grade levels (Graham, Harris, Fink-Chorzempa, & MacArthur, 2003; Graham et al., 2008) and sustained difficulty may constrain acquisition of more complex writing skills.

**Multiple Constraints in Writing Development**

Berninger and colleagues (1992) propose written expression needed for sustained writing, such as stories and essays, results from three levels of development: neurodevelopment, linguistic, and higher-level cognition. Neurodevelopment describes biological structures and maturation, such as fine finger movements responsive to visual input, needed for handwriting and spelling. Once writers display a minimum degree of proficiency with handwriting and spelling, they develop linguistics or skills of constructing words and sentences that fit conventions of syntax. The third level, higher-level cognition, includes processes of planning, translating, and revising (Hayes & Flower, 1988).

The three levels of development form a dynamic and correlated system because each level changes across the life span and levels influence each other. The levels act as constraints, preventing drastic changes in quality and quantity of written expression. For example maturation of hand muscles and coordination of visual input makes easier acquisition of handwriting and spelling. Conversely, problems in neurodevelopment make more difficult acquisition of handwriting and spelling. In order to produce substantial and meaningful changes in written expression, educators need powerful interventions that address multiple skills and strategies.
To address linguistic constraints of students with writing difficulties, the skills-based approach (Kammenui & Simmons, 1990) emphasizes an instructional continuum of writing skills progressing from handwriting and spelling to multi-paragraph composition. Following proficiency with handwriting and spelling, simple sentences serve as a bridge to acquisition of paragraph composition. The approach suggests instruction in simple sentence should result in increased skills in syntax and higher proportions of complete sentences. Proficient simple sentence construction prepares writers for paragraph composition and more complicated sentence construction such as complex or compound sentences. Accordingly, a recent review of the literature found researchers have either intervened on simple sentence construction and progressed to complicated constructions or started intervention with complicated constructions (Datchuk & Kubina, 2011a).

**Academic Outcomes to Ease Linguistic Constraints**

Given the multiple constraints of written expression and assumptions of a skills-based approach of written expression as a continuum of skills (Kammenui & Simmons, 1990), it benefits writers struggling with sentence construction to receive interventions capable of producing proximal and distal growth. Proximal growth defined as close in time and content to intervention, and distal growth as further away in time advancing along the continuum of skills. In other words, experimental effects should maintain across time and become useful to participants (Binder, 1996). To achieve proximal and distal progress, researchers have advocated for several academic outcomes occurring in an instructional hierarchy (Haring & Eaton, 1978). Additionally, the theoretical literature of behavioral fluency (Binder, 1996; Johnson & Layng, 1992; Kubina & Morrison,
2000), an outcome in the instructional hierarchy, clarifies the causal mechanism behind the ability of interventions to promote proximal growth and apply towards continued distal progress.

The instructional hierarchy organizes academic outcomes as acquisition, fluency, and application (Binder, 1996; Codding & Poncy, 2010; Haring & Eaton, 1978; Johnson & Layng, 1992; Skinner & Daly III, 2010). Acquisition occurs before fluency. Students acquire academic material through increased accuracy of responses. Fluency results after students have attained not only a high degree of accuracy but also response speed or pace (Kubina & Morrison, 2000). The last learning outcome takes place when students apply an acquired and fluent response to a related compound behavior.

During application, individuals combine all element responses into a compound behavior (e.g., sentence construction applies to extended composition or paragraph construction). Application differs from generalization (Haring & Eaton, 1978; Kubina, 2005). Generalization focuses on performance of a response across a different setting or points in time, but application consists of instances where an element response forms a critical component of a multiple component behavior (Kubina, 2005).

A number of studies examining application have consistently demonstrated a predictable outcome; fluent element behaviors maintain across time and combine and/or coalesce to a more complex, compound behavior (Bucklin, Dickinson, & Brethower, 2000; Hughes, Beverley & Whitehead, 2007; Kubina, Young & Kilwein, 2004). Failure to develop an element behavior to an appropriate frequency can result in inadequate maintenance across time and hinder or completely deter formation of a compound behavior. For example, fluency in handwriting contributes to word count in composition
Low frequency, hesitant handwriting will result in fewer words produced in composition.

**Academic Outcomes in Prior Studies of Sentence Construction**

Writing research has yet to address interventions focusing on a combination of acquisition, fluency, and application of sentence construction. With a few exceptions, prior simple and complicated sentence construction studies have primarily focused on outcomes of acquisition and application (Graham & Perin, 2007; Hillocks, 1986; Mason & Graham, 2008; Rogers & Graham 2008) but not fluency. Two recent studies (Datchuk & Kubina, 2011b; Datchuk, Kubina, & Mason, 2011), however, investigated the effects of intervention on acquisition and fluency of compound sentences and simple sentence construction. The results appear promising.

One study (Datchuk & Kubina, 2011b) focused on acquisition and fluency of compound sentences and complicated simple sentences for four adolescents with disabilities and writing difficulties. Acquisition and fluency procedures featured sentence combining. Sentence combining requires writers to form more sophisticated sentences, such as compound and complex sentences, by combining two phrases with a connector, such as a conjunction (Strong, 1986).

The data suggest that during acquisition all participants increased accuracy of correct combinations. Following acquisition, participants engaged in Frequency Building to a Performance Criterion (FBPC). FBPC entailed timed practice trials of sentence combining to a criterion of 8 correct sentence combinations with a maximum of 1 incorrect in 3 minutes. All participants improved accuracy and speed on assessment during FBPC with minimal to no decreases in maintenance. Participants received no
explicit instruction to apply sentence combining to extended compositions but still achieved modest amounts of taught constructions in extended compositions. Results also extended prior studies and reviews of the literature (Graham & Perin, 2007; Hillocks, 1986) that found typically developing students and elementary aged students with disabilities and writing difficulties benefited from acquisition of sentence combining but showed modest application to extended composition.

Another study (Datchuk, Kubina, & Mason, 2011) addressed the outcomes of acquisition and fluency of simple sentence construction of elementary aged students with disabilities and behavioral concerns. Acquisition featured picture-word prompts. Pictures depicted various scenes such as a child playing soccer. Words accompanied each picture, such as ‘boy’ and ‘soccer.’ The words and pictures served as prompts for participants to construct simple sentence, such as ‘The boy kicked the soccer ball.’ The use of picture-word prompts potentially eases task complexity by altering sentence construction from idea generation to description of a picture (Kammennui & Simmons, 1990).

The data suggest that following acquisition all participants showed steady improvement in accuracy of complete sentences and correct word sequences (CWS). CWS measured the amount of words showing correct capitalization, punctuation, and syntax (Parker, McMaster, & Burns, 2011). Complete sentences occurred for each sentence that started with a capital letter, ended with a punctuation point, had at least one subject and one verb, and made syntactic sense (Bui, Schumaker, & Deshler, 2006). Improvement in accuracy and speed continued during FBPC, all participants showed their highest level of CWS and complete sentences and lowest level of incorrect word
sequences and incomplete sentences. Participants showed minimal to no decreases in retention.

Instructors provided no directions to apply sentence construction to descriptive paragraphs. All participants showed consistent increases from baseline on the amount of CWS found in paragraphs, but the number of complete sentences showed only modest increases from baseline. The results extended prior studies that used pictures as visual prompts as part of multi-component writing interventions for students with learning disabilities (LD; Anderson & Keel, 2002; Walker et al., 2005) and English language learners (Viel-Ruma et al., 2010), but the use of multiple-components during intervention made it difficult to parse effects solely attributable to visual prompts.

Both studies (Datchuk & Kubina, 2011b; Datchuk, Kubina, & Mason, 2011) suggest that acquisition and fluency intervention improved proximal performance (accuracy and speed of responses), facilitated retention of effects across time, and effected more complex, distal responses. Because no study has intervened on acquisition, fluency, and application, questions remain as to the additional benefits derived from explicitly intervening on application. Furthermore, interventions beginning with complicated constructions have garnered the most attention from writing researchers (Graham & Perin, 2007; Hillocks, 1986) and in comparison fewer studies intervened on simple sentence construction (Mason & Graham, 2008; Rogers & Graham, 2008).

Given linguistic constraints of written expression (Berninger et al., 1992), sequential development of sentence construction skills (Kamenui & Simmons, 1990), and the paucity of interventions designed for simple sentence construction, a critical need exists for interventions that can impact proximal outcomes of acquisition and fluency of
simple sentence construction and distal outcomes of application of simple sentences to paragraphs. The present study sought to develop an intervention that encompasses an instructional hierarchy for adolescents (defined in this study as grades 8-10) struggling with simple sentence construction.

To examine effects of intervention on acquisition, fluency, and application, the present study will ask five experimental questions. First, does accuracy of simple sentences and word sequences of adolescents with simple sentence difficulty improve following instruction with picture-word prompts? Second, does frequency building to a performance criterion (FBPC) lead to increased speed and accuracy of simple sentences and word sequences? Third, what effect does instruction and FBPC have on application of simple sentences and word sequences to descriptive paragraphs? Fourth, does instruction in descriptive paragraphs lead to additional gains in accuracy of sentences and word sequences within descriptive paragraphs? And fifth, what effect does instruction and FBPC of simple sentence construction and descriptive paragraph instruction have on maintenance?
Chapter 2

Methods

Participants and Setting

Table 2 shows participant characteristics. Participants included three females (Rhonda, Kima, and Beadie) and one male (Omar). Ages ranged from 13 to 17 years old. Kima and Beadie received special education services for specific learning disabilities and Rhonda for mild intellectual disability. Omar, referred by teachers for special education evaluation, was retained in the eighth grade due to inadequate academic progress. The prior school year all participants received remedial instruction in written expression.

At the start of the 2010-2011 school year, participants completed the Terra Nova Complete Battery (CTB/McGraw-Hill, 2007). All participants scored below the 50th percentile in reading and language subtests. Prior to the start of intervention, participants completed the Woodcock-Johnson Writing Fluency Subtest (WJ-R; Woodcock & Johnson, 1990). With a range of percentile ranks from 1 to 2, performance fell significantly below their peers.

Participants attended an urban charter school in Southern Louisiana. The charter school served a historically high poverty population, 95% of students qualify for free and reduced lunch, within a densely populated minority community, 99% of students identify as African-American. The experimenter previously worked as a teacher and director of special education for several years at the school and selected the school district because of familiarity with students and staff.

The intervention occurred during summer break. Each participant worked individually with the experimenter in an unoccupied classroom at the school or a quiet
area in their homes such as the dining room area. The Pennsylvania State University Institutional Review Board found the study met local, state, federal, and University policies regarding use of human participants in research.

**Materials**

The experimenter used stimulus materials from a prior sentence construction study (Datchuk, Kubina, & Mason, 2011) and created additional instructional and assessment materials. Materials featured text from basal readers written at a maximum third grade decoding level as measured by a spache readability formula. Text featured a third grade decoding level because all participants displayed fluent reading decoding at this level as measured with DIBELS passages (Good & Kaminski, 2002). Pictures used as visual prompts came from a website of commercially available clip art (Getty Images, 2011) and from several internet searches using Google Images. A commissioned graphic designer created ten of the larger pictures used for descriptive paragraphs. The experimenter randomized and counterbalanced assessment measures across participants.

**Dependent Variables**

This study examined four behaviors. The first behavior was the frequency of word sequences: correct word sequence (CWS) and incorrect word sequence (IWS) per 1-minute. A CWS occurred for each instance a sentence began with a capital letter, finished with an end mark, and between syntactically correct words (McMaster et al., 2011). An IWS occurred for the inverse: each sentence beginning with a lower case letter, not including an end mark, and between syntactically incorrect words. Differing from prior studies that used CWS (Amato & Watkins, 2011), this study did not count errors in spelling as IWS because intervention did not address spelling skills. Table 1
shows an example of responses scored for correct and incorrect word sequences. Carrots between words indicate CWS and x’s indicate IWS. For example, “Tim rode a skateboard in the street.” earns a score of 8 CWS and 0 IWS. A construction of “tim rided a skateboard the street.” earns a score of 3 CWS and 4 IWS because it does begin with a capital letter and contains grammatically incorrect sequences around ‘rided’ and ‘the.’

The second behavior was the number of simple sentences: complete and incomplete sentences. Complete sentences counted each occurrence that a sentence began with a capital letter, ended with a punctuation mark, had at least one subject and one verb, and made syntactic sense (Bui, Schumaker, & Deshler, 2006). Incomplete sentences occurred with at least one of the following errors: sentences began with a lower case letter, did not end with a punctuation mark, failed to contain at least one subject and one verb, and did not make syntactic sense. Table 1 shows an example of responses scored for complete and incomplete sentences. The measure allowed the experimenter to distinguish between complete and incomplete sentences but it remained less sensitive to linguistic growth compared to CWS (Parker, McMaster, & Burns, 2011) For example, a complete sentence could contain 20 CWS or 10 CWS.

To observe the first two behaviors, word sequences and sentences, participants completed a 1-minute timing of sentence construction at the end of each session. During timings, participants constructed a series of unrelated simple sentences. Each sentence construction corresponded to a small picture that depicted a person or item involved in an action. Each picture also prompted participants with two possible words to use in the construction, such as the name of the person or item in the picture and either a verb or object. For example, one picture displayed a child on a skateboard in the street and two
words ‘tim’ and ‘street.’ Participants received no feedback on performance and no
prompts to use sentence construction.

The third and fourth behaviors were the frequency of word sequences (CWS and
IWS) and simple sentences (complete and incomplete) in descriptive paragraphs. To
observe the third and fourth behaviors, participants constructed a descriptive paragraph at
the beginning and end of the baseline phase and at the end of the three experimental
phases: sentence instruction, FBPC of sentences, and descriptive paragraph instruction.
During baseline, each participant constructed a descriptive paragraph at the beginning
and end of the phase. During paragraph construction, participants had a maximum
duration of 3 minutes to construct a series of related simple sentences that corresponded
to a single large picture. The picture depicted multiple persons or items involved in a
related activity. The picture also provided names of each person or item and five
additional words that described the verbs or items depicted. For example, one picture
displayed three cooks preparing a meal in a kitchen. The picture provided the names of
each cook, “betty, david, and the chef,” and five words that the students could use, “beef,
bread, mixed, spoon, cooked.” Participants received no feedback on performance or
prompt to improve sentence writing or continue writing for the allowed time.

**Observer Accuracy**

Prior to beginning the study, the experimenter taught two teachers how to
calculate the dependent measures. The experimenter created 50 practice examples of all
four measures. Examples contained correct and incorrect responses. To establish the
true value of all 50 practice examples, the experimenter repeatedly scored each example
and cross checked the results with an independent scorer, an associate professor of
special education at Pennsylvania State University with a specialty in literacy, until a consistent score emerged; the subsequent score represented the true value with which to derive an accuracy measure.

The experimenter, a doctoral candidate of special education at Pennsylvania State University, previously conducted accuracy trainings on five additional studies including two that used correct word sequences and number of complete sentences. The experimenter modeled scoring procedures for the observers with 10 examples. The experimenter then scored an additional 10 examples concurrently with the observers. Concurrent scoring continued until each observer achieved 100% accuracy with the true values. Following concurrent scoring, each observer independently scored at least 10 examples with 100% accuracy. Instruction continued until observers independently achieved at least 100% accuracy on three consecutive occasions.

One observer, a first year high school general education teacher, served as primary scorer and scored all measures following each session. Scoring measures concurrently with the study allowed the experimenter to: (a) determine the suitability and reliability of the collected data, and (b) select a start date for intervention by analyzing the accurate data with trend and level in baseline.

**Observer Agreement**

A second observer trained in scoring protocol, a special education teacher with two years experience with students with learning disabilities, intellectual disabilities, and autism randomly scored a third of the measures for calibration (Johnston & Pennypacker, 2009). The second observer scored measures from each participant, each behavior, and across all conditions. Randomly selecting a third of the measures for calibration
facilitated the ongoing stability of accurate dependent measures and followed general recommendations in the literature (Kennedy, 2005; Barlow, Nock, & Hersen, 2009). Using exact agreement procedures (Kazdin, 2011), total agreements divided by total number of intervals multiplied by 100, observers agreed 93% on measures.

To guard against observer drift, the experimenter planned to lead recalibration sessions. If scores differed by more than 90% at any point during the study, the experimenter would examine points of disagreement and re-teach scoring procedures. Recalibration sessions, however, did not occur because scores never dropped below 90% accuracy. The observers were instructed not to interact with each other about the behavioral codes at any time during the study. The experimenter removed from measures all information that identified participants and explained that measures came from a collection of participants.

**Experimental Procedures**

**Participant Selection.** Selection of participants followed four steps. Teachers nominated students who showed difficulties with simple sentence construction including students with a disability diagnosis. An instructional coach at the school, trained on assessment protocol, collected assessment measures from prospective participants. To qualify for participation, nominated students had to display performances falling below the performance criterion of 30 CWS with 0 to 3 IWS on a timed 1-minute assessment of sentence construction. The performance criterion came from a prior study with similar stimulus materials (Datchuk, Kubina, & Mason, 2011). The 1-minute assessment required students to construct a series of unrelated simple sentences that corresponded to small pictures. Each picture displayed a person, object, or animal performing an action.
Two words that the students could use to construct a simple sentence accompanied each picture. Prior research suggests writing output interacts with reading, handwriting, and spelling (Berninger et al., 2002; Graham et al., 1997). To control for possible confounds to writing output, nominated students completed additional assessments of reading, handwriting, and spelling.

Prospective participants that lacked fluent reading, handwriting, and spelling skills would have found instructional materials difficult and may not have achieved the CWS performance criterion. Instructional materials used across experimental phases featured text written at approximately a third grade decoding level. To control for reading as a potential confound, students had to display acceptable reading decoding on at least a third grade level with DIBELS passages (Good & Kaminski, 2002).

Materials used during instruction and FBPC also required acceptable handwriting and spelling fluency. Participants in a prior study (Datchuk, Kubina, & Mason, 2011) were required to produce approximately 100 correct letters per minute to achieve the CWS performance criterion and to display acceptable spelling fluency. To control for handwriting, students had to display approximately 100 correct letters per minute on a copy task. To control for spelling, students needed to correctly spell 25 frequently used words with only 1 to 3 misspellings or incompletions. To assess spelling, the instructional coach vocally presented groups of words. Students transcribed each group of words within a maximum of 10 seconds. The experimenter determined frequently used words from a prior study that used similar stimulus materials (Datchuk, Kubina, & Mason, 2011).
Following completion of all assessment measures, all participants completed the Writing Fluency subtest from the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R; Woodcock & Johnson, 1990). The writing fluency subtest offers several advantages. First, scores on the subtest quantify writing performance and permit description of pre-intervention performance in relation to a national sample of their peers. This comparison allows future researchers to replicate participant selection procedures with a valid and reliable assessment. Second, the subtest benefits from widespread use among writing researchers and administration allows comparison across studies.

**Baseline.** Participants recently finished the 2010-2011 academic school year. Baseline occurred during summer break in between the 2010-2011 and 2011-2012 school years. Participants did not attend school on a daily basis and received no instruction in written expression during this time. During each baseline session, the experimenter visited each participant’s home and observed the dependent variables. The experimenter and participant sat in adjacent chairs in a quiet area of the home, such as the dining room table. Participants received no feedback on performance.

**Intervention.** Intervention entailed sequential delivery of three independent variables: (a) Sentence Instruction, (b) FBPC of sentence construction, and (c) Paragraph Instruction. The experimenter served as primary instructor. Participants worked individually with the instructor.

Both instructional phases, Sentence and Paragraph Instruction, featured three lessons. Each lesson repeated until participants displayed at least 90% accuracy. The instructor followed explicit instruction formats of model-lead-test (Archer & Hughes, 2011). For each new skill, the instructor physically and vocally modeled five examples.
and nonexamples. The instructor lead participants through guided practice by providing vocal prompts on approximately 10 examples and nonexamples and immediately corrected errors. To verify independence, participants completed approximately 10 example and nonexamples without any vocal or physical models or prompts.

During each FBPC session, participants completed three, 1-minute timings of simple sentence. The instructor provided error correction between timings. The instructor modeled the correct response orally and participants corrected errors by transcribing the correct response. The instructor vocally praised students who reached the performance criterion of at least 30 CWS with 0 to 3 IWS and encouraged participants who do not reach criterion. The performance criterion was from a prior study that used similar stimulus materials (Datchuk, Kubina, & Mason, 2011).

**Maintenance.** The Maintenance phase occurred approximately 30, 31, and 32 days following completion of the Paragraph Instruction phase. During Maintenance, participants received no aspect of the intervention. The experimenter observed all four dependent variables by visiting each participant’s home while participants completed 1 minute and 3 minute assessments.

**Individual Lesson Procedures**

At the beginning of the Sentence Instruction phase, the instructor introduced simple sentences as an important skill needed for clear written expression. The instructor defined complete simple sentences as containing two main parts: one part that names someone or something and a second part that tells more. Incomplete sentences missed one of the two main parts.
During lesson one, participants read aloud complete and incomplete sentences that corresponded to a picture. For example, a picture showed individuals at a campsite engaged in multiple activities. Sentences below the picture described the picture. Using the definition of simple sentences as two main parts, one part that names someone or something and a second part that tells more, participants orally identified complete and incomplete sentences and fixed incomplete sentences by transcribing the missing main part.

During lesson two, participants continued to review both parts of a simple sentence by orally identifying parts in a collection of sentences. In contrast to lesson one, sentences no longer corresponded to a picture. Participants read aloud a series of phrases and orally identified each phrase as a complete or incomplete sentence and if incomplete, then identified the part presented. Participants then filled in missing capitalization and/or punctuation.

In the third lesson, participants viewed a collection of small pictures that depicted a single person or item engaged in an activity. Pictures also prompted participants with two words: the name of the subject and either a verb or object. Using both words participants constructed simple sentences for each picture.

For the FBPC phase, participants constructed sentences corresponding to small pictures. Similar to lesson three of Sentence Instruction, each picture showed two words: the name of the subject and either a verb or object. Participants completed three, 1-minute timings each session. Each session presented the same stimulus materials for all three timings (e.g., three copies of sheet 1), but stimulus materials changed across sessions (e.g. three copies of sheet 1 on Monday, three copies of sheet 2 on Tuesday, etc).
Following each of the timings, the instructor scored responses and provided participants with the amount of CWS and IWS. The instructor orally corrected IWS and participants transcribed a new response. The instructor praised participants for constructing sentences that contained both parts of a simple sentence and encouraged participants to reach the performance criterion. To detect effects of the intervention on stability of performance, all participants stayed in the FBPC phase for a minimum of 5 sessions. The phase finished when participants achieved the performance criterion, at least 30 CWS with 0 to 3 IWS on the majority of timings for 2 consecutive days, or following 15 sessions, whichever occurred first.

The Paragraph Instruction phase featured three lessons. The instructor introduced descriptive paragraphs as a collection of simple sentences that describe the same topic and differed from fictional narratives that contain elements such as characters and setting or essays that contain elements such as topics and reasons. To clearly write sentences about the same topic, the instructor introduced the difference between complete and run-on sentences.

In lessons one and two of Paragraph Instruction, participants read aloud sentences and paragraphs that described different topics. Paragraphs had errors in capitalization, punctuation, and run-on sentences. Participants vocally identified the part of each sentence that named someone or something, and then inserted correct capitalization and punctuation. Participants vocally identified and changed run-on sentences to complete, simple sentences. During lesson three, participants constructed a series of related sentences that corresponded to a single large picture. Each large picture featured multiple persons and items engaged in a related activity. Pictures provided the names of each
person and item and provided a list of five possible words to use during composition. Before finishing each composition, participants checked sentences for correct capitalization and punctuation, inclusion of a part that names something and a part that tells more within each sentence, and presence of run-on sentences.

**Procedural Integrity**

An audio device on an iPad recorded all experimental sessions. Following completion of the study, the experimenter taught instructional protocol to an independent observer to a 100% criterion. A doctoral candidate of special education at Pennsylvania State University served as the independent observer. The independent observer randomly selected a third of all audio recordings across each participant and experimental phase. Using the instructional scripts, student stimulus materials, and a checklist of instruction and assessment protocols, the observer scored recordings for procedural integrity. Recorded lessons consistently achieved a 100% procedural integrity.

**Social Validity**

To ascertain the social validity of goals, procedures, and outcomes, participants completed two types of measures: subjective evaluation and normative comparison (Kennedy, 1992). Subjective evaluation describes individual reaction to the intervention. Normative comparison extends reactions across participants and to additional samples outside of the present study.

During subjective evaluation, the experimenter vocally asked three open-ended questions to participants and teachers and used an audio device to record responses. The first question, what do you feel is the purpose of sentence writing? Second, what did you like or not like about instruction? What would you change? Third, how do you feel about
your sentence writing after being taught this skill and then practicing doing it? Teachers at the school with knowledge of the participants writing skills responded to similar questions. First, what do you feel is the purpose of sentence writing? Second, how do you feel about this student’s sentence writing after being taught this skill and then practice doing it?

For a normative comparison, participants completed the Writing Attitude Survey (Kear, Coffman, McKenna, & Ambrosio, 2000). The Writing Attitude Survey contained 28 likert-scale questions on a wide variety of writing text structures and tasks, including: letter and opinion writing, diary entries, and poetry. The survey has shown a high degree of reliability, coefficients ranged from .85 to .93, and content validity with a large national sample of students in Grades 1 to 12 (Kear et al., 2000). Interactions between the Writing Attitude Survey and experimenter created questions may reveal correlations on how participants rated the intervention with their overall view of writing.

**Experimental Design and Data Analysis**

The present study featured a multiple baseline across participants design (Kazdin, 2011). The design offered the following benefits. First, one participant at a time, out of a total of four participants, entered the Sentence Instruction phase. Staggering introduction of intervention demonstrated that only the systematic implementation of the intervention was responsible for the observed changes (Cooper, Heron & Heward, 2007). Second, because each participant entered the intervention at a different point in time, the design provided multiple opportunities to replicate and verify the effects of intervention and establish a functional relationship between independent and dependent variables. And third, the multiple baseline across participants design was also ideal because the present
study attempted to create irreversible behaviors with fluent sentence construction skills, preventing the use of other designs like the reversal (Cooper et al., 2007).

The experimenter displayed dependent measures on computer generated Standard Celeration Charts (SCC; Graf & Lindsley, 2002). The SCC has a semilogarithmic, multiply/divide y-axis and an add/subtract x-axis; it displays six base 10 cycles from .001 to 1000. Semilogarithmic charts maintain proportional distance and compared to equal-interval charts, decrease distance between rulings (Schmid, 1986). Moving from one to two has the same amount of space as going from two to four because both moves result in a mathematic doubling. Equal-interval scaled charts do not maintain proportional distance and require a third more distance when moving from two to four. Given the smaller space between rulings, the SCC and other charts with proportional distance conservatively display data points and guards against researchers attributing experimental effects to liberal amounts of distance between rulings (Binder, 1996; White, 1986) or the exaggerated effects nonstandard equal interval charts provide (Lindsley, 2010).

To evaluate experimental effects and select participants to begin intervention, the experimenter used visual analysis (Richards et al., 1999) incorporating celeration (Lindsley, 1991), and the Accuracy Improvement Measure (AIM; Pennypacker, Guiterrez, & Lindsley, 2003). Visual analysis involved detecting changes within and across experimental phases. Within phase changes included level, direction/degree of trend via celeration, and variability.

Level refers to the mean performance of the phase. Direction/degree of trend describes the presence of a flat, increasing, or decreasing slope with celeration the experimenter can quantify the trend when possible. Calculation requires a minimum of
five data points. When five data points were not present, level was calculated with the mean. The experimenter used the split-middle technique (White, 1974) to visually depict trend. The variance of data points from the mean or trend refers to variability. Across phase analysis includes changes in level and trend. Differences in level can remain constant, increase, or decrease. Trend can change direction/degree across phases.

The depiction of proportional distance on the SCC made possible use of celeration (Lindsley, 1991). Celeration values are a metric indicating speed of trend lines in relation to the semilogarithmic axes, in other words celeration describes change in frequency over time (Johnston & Pennypacker, 2009). For example, a trend line rising from three to six across 7 calendar days equals a doubling in speed or a celeration value multiplying by 2 (x 2.0/7 days). A trend line falling from six to three across five calendar days equals a halving in speed or a celeration value dividing by two (÷2.0/5 days). Celeration values have two benefits. First, celeration values describe the trend determined by using the split-middle technique. The split middle technique benefits from widespread acceptance among researchers and practitioners (Kazdin, 2011). Second, the celeration value provides a quantification of learning. The celeration value precisely measures the effects of an intervention and incorporates the semilogarithmic chart by describing trend in relation to the axes.

The Accuracy Improvement Measure (AIM; Pennypacker, Guiterrez, & Lindsley, 2003) numerically describes the accuracy of concurrent trends across calendar days. The AIM compares celerations of two related behaviors to determine accuracy. In the present study the experimenter calculated AIM for CWS and IWS and complete and incomplete sentences. The experimenter determined the AIM by multiplying or dividing two related
celeration values. For example, a CWS celeration value of x 2.0 and an IWS celeration value of ÷2.0 would equal an AIM of x4.0 meaning accuracy of performance improved by a multiple of 4.0. As another example, a CWS celeration of x 2.0 and IWS celeration value of x 3.0 would equal an AIM of 1.5 indicating accuracy decreased at a rate dividing by 1.5. Because AIM uses celeration values to calculate accuracy, it incorporates trend across data points. Other descriptive measures of accuracy can skew or ignore trend in data, such as mean percentage correct, resulting in an incomplete description of experimental effects.

Participants individually received the first intervention following a baseline that either showed stable or declining accuracy of word sequences as indicated by an AIM below x 1.0 or a stable celeration of CWS as shown by a celeration value of 1.2 or less. Participants did not have to display stability on the other two behaviors, the amount of CWS and complete sentences within descriptive paragraphs (described below), to begin sentence instruction because the first two experimental phases did not explicitly intervene on descriptive paragraphs and the experimenter did not graph the measures.

Also, during the study participants periodically completed a 3-minute descriptive paragraph composition. The descriptive paragraph composition allowed the experimenter to evaluate the degree to which the first two experimental phases, Sentence Instruction and FBPC, applied to descriptive paragraphs; it also measured the impact, if any, from the third experimental phase, Paragraph Instruction. Nutter and Reid (1978), as an example, used a similar design to detect transfer of intervention to different stimuli. In their study, participants with intellectual disabilities dressed miniature dolls in color-
coordinated outfits. Experimenters conducted daily measures using miniature dolls and periodic measures with adult-sized clothing to assess if participants transferred responses.
Chapter 3

Results

The results from the present experiment appear in graphic and tabular form. Table 3 shows descriptive statistics for behaviors per 1-minute: correct word sequences, incorrect word sequences, complete sentences, and incomplete sentences. Table 4 shows results from descriptive paragraphs per 3-minutes. Figures 1 through 8 display computer generated Standard Celeration Charts (SCC). SCC have a semilogarithmic scale of frequencies per minute along the y-axis and a x-axis of successive calendar days. Preserving calendar days allows researchers to analyze effects of intervention across real-life time dimensions and display an authentic record of maturation, allowing detection of maturation effects (Shadish, 2010). As a convention of the SCC, experimenters describe participant and study characteristics below the x-axis in the labeled blanks area (Graf & Lindsley, 2002) and provide a key inside of the chart area describing phases, celeration, and AIM.

On Figures 1 to 4, dots represent the amount of CWS per 1-minute and X’s depict the amount of IWS per 1-minute. On Figures 5 to 8, dots show the amount of complete sentences per 1-minute and X’s are the amount of incomplete sentences per 1-minute. Figures 1 through 8 feature vertical and horizontal lines. Vertical lines indicate a phase change. Within the baseline and FBPC phases, dotted horizontal lines intersect data points to show trend. Across experimental phases, solid, horizontal lines or time bars rest on the one line to indicate that each timing within the phase lasted 1-minute. Dots or X’s falling below the time bar reflect a frequency of zero.

Correct and Incorrect Word Sequences Per 1-Minute
**Rhonda.** Figure 1 shows Rhonda’s word sequences per 1-minute across experimental phases. Rhonda’s performance in baseline worsened across the 6 baseline sessions. Data paths gradually converged, downward for CWS (celeration = \(\frac{-1.1}{8}\) days) and upward for IWS (celeration = \(\frac{1.2}{8}\) days), indicating a loss of accuracy and speed. AIM for the celerations came to divide by 1.3 across 8 days.

Upon entering Sentence Instruction, the level of CWS immediately increased, rising from 17 to 23. IWS lowered in level except for a spike of 6 IWS occurring the second instructional day. During the Frequency Building to Performance Criterion (FBPC) phase, CWS had a moderate upward trend (celeration = \(\frac{1.3}{11}\) days) and IWS sharply declined (celeration = \(\frac{-3.0}{11}\) days). The diverging trends indicated an improvement in the speed and accuracy of responding (AIM = \(\frac{3.6}{11}\) days).

After achieving the performance criterion of 30 CWS with 0 to 3 IWS on two consecutive occasions, Rhonda completed FBPC. FBPC lasted a total of 9 sessions, 27 timings, and approximately 60 minutes. Rhonda continued to improve during 3 sessions of Paragraph Instruction; she achieved a higher mean level of CWS, 25.3, and lower mean level of IWS, 1.0. Maintenance occurred 39, 40, and 41 days from the end of all experimental phases. Rhonda achieved her highest level of CWS, with a mean of 29.3, but IWS fluctuated and slightly increased, with a mean of 2.3 IWS.

**Kima.** Figure 2 shows word sequences for Kima across experimental phases. During 8 baseline sessions, Kima consistently showed a high level of CWS with a mean of 22 and celeration multiplying by 1.1 across 11 days. The accelerating trend in IWS (celeration = \(\frac{1.3}{11}\) days) indicated a decrease in accuracy. The AIM of celerations divided by 1.2 across 11 days overall a worsening of performance.
Kima’s CWS slightly improved upon entering Sentence Instruction. The level of CWS increased, with a mean of 22.7, and IWS decreased with a mean of 3.3. The FBPC phase showed the highest level of CWS and lowest level of IWS, indicating an increase in speed and accuracy (AIM = x1.1/7 days). CWS had a slight upward trend (celeration = x1.1/7 days) and IWS had a flat trend (celeration = x1.0/7 days) with a range from 0 to 3.

Kima achieved fluency on the third day of FBPC but stayed in FBPC for a total of 5 to capture stability of performance. She completed a total of 15 timings in approximately 30 minutes. Paragraph Instruction revealed a slight decrease in level of CWS but IWS stabilized with performances of zero in each session. Maintenance occurred 37, 38, and 39 days following paragraph instruction. Kima displayed comparable performance to Paragraph Instruction in CWS, with a mean of 25.3, and IWS, with a mean of 0.7.

**Beadie.** Figure 3 displays Beadie’s word sequences per 1-minute across experimental phases. Across 12 baseline sessions, Beadie consistently showed high CWS and low IWS. Flat, stable trends for CWS and IWS (celerations = x1.0/16 days) indicated high accuracy in responses with little to no increase in speed (AIM = x1.0/16 days).

During Sentence Instruction, Beadie’s CWS had a slightly higher level, with performances of 22, 27, and 22. IWS also gained in level, indicating speed of writing increased but not accuracy. In the FBPC phase Beadie’s data demonstrated a higher level of CWS with a stable, accelerating trend (celeration = x1.2/14 days). IWS decreased in level compared to instruction but showed an unstable, slightly accelerating trend.
(celeration = x1.5/14 days), indicating an increase in speed but decrease in accuracy (AIM = ±1.3/14 days).

Beadie reached the performance criterion on 2 consecutive days stopping the FBPC phase; she completed 9 sessions and a total of 27 timings in approximately 60 minutes. Entering the Paragraph Instruction phase, CWS increased in mean level, 29 CWS per minute, and the IWS level, 1.3, returned to baseline levels. Maintenance occurred 30, 32, and 39 days following completion of Paragraph Instruction. Beadie achieved her highest level of CWS, with a mean of 31, and lowest level of IWS, with a mean of 0.3.

**Omar.** Figure 4 shows Omar’s word sequences per 1-minute across experimental phases. Omar increased speed but decreased accuracy in 8 baseline sessions (AIM = ±1.8/12 days). Data paths displayed gradual acceleration in CWS (celeration = x1.3/12 days) and a sharp rise in IWS (celeration = x2.3/12 days). Stated differently, as he tried to write more he made even more mistakes.

Sentence Instruction showed a relatively flat level of CWS and declining IWS, decreasing from 9 and 7 to 6 on the last day of the phase. During FBPC, separation widened between CWS and IWS with diverging trends of rising CWS (celeration = x1.1/14 days) and a sharp decline in IWS (celeration = ±2.0/14 days). The AIM of celerations multiplied by 2.2 across 14 days. Omar achieved the performance criterion on two consecutive days. The FBPC ended following 9 sessions and a total of 27 timings across approximately 60 minutes. Paragraph Instruction showed a consistent high level of CWS, mean of 23, and low level of IWS, with a mean of 1. Maintenance occurred 30, 31,
and 32 days following completion of Paragraph Instruction. Omar displayed his highest level of CWS, with a mean of 30.3, and a low level of IWS, with a mean of 1.

**Across participants.** The multiple-baseline design required staggered introduction of the Sentence Instruction phase. All participants displayed stable or decreased performance during baseline. Three of four participants, everyone except Beadie, gradually increased accuracy during Sentence Instruction. All participants gained speed and accuracy during FBPC and Paragraph Instruction. Maintenance revealed performance comparable to experimental phases.

**Complete and Incomplete Sentences Per 1-Minute**

**Rhonda.** Figure 5 shows the results of Rhonda’s complete and incomplete simple sentences written per 1-minute across experimental phases. During baseline, Rhonda consistently wrote more incomplete than complete sentences; 0 complete sentences occurred each session and incomplete sentences ranged from four to five. AIM came to multiply by 1.0 across 8 days. Complete and incomplete sentences showed flat, stable trends (celerations = $x1.0/8$ days).

During Sentence Instruction, complete sentences showed a slightly higher level, with a mean of one, and incomplete sentences slightly lowered. Data paths overlapped in lesson three with an equal amount of 2 complete and 2 incomplete sentences. A gradual change in level for both data paths continued into FBPC. Trends for complete and incomplete sentences crossed and diverged (AIM = $x3.0/11$ days); complete sentences showed a rise in trend (celeration = $x1.5/11$ days) and incomplete sentences dropped sharply (celeration = $±2.0/11$ days). The Paragraph Instruction phase had the highest level of complete and lowest level of incomplete sentences with means of 4 complete and
0.3 incomplete sentences. Rhonda displayed uneven and variable performance during maintenance. Complete and incomplete sentence data points overlapped indicating a decrease in accuracy.

**Kima.** Figure 6 displays simple sentences per 1-minute by Kima across experimental phases. Kima showed inconsistent and inaccurate performance during baseline (AIM = +3.0/11 days). CWS declined in trend (celeration = +2.0/11 days) and IWS increased (celeration = x1.5/11 days). For 6 of the 8 baseline sessions the frequency of incomplete sentences overlapped complete sentences.

Upon entering Sentence Instruction, an immediate change in level occurred, rising from 0 complete sentences at the end of baseline to 2 complete sentences. Data paths converged and then separated. Complete sentences went from one to two and incomplete sentences fell from four to two. In the FBPC phase data paths completely separated. Trends for complete sentences accelerated (celeration = x1.3./7 days) and incomplete sentences stabilized (celeration = x1.0/7 days). Compared to Sentence Instruction, complete sentences gained in speed and accuracy during FBPC (AIM = x1.3/7 days). Paragraph Instruction showed a slight drop in level for complete sentences, mean of 2, but incomplete sentences stayed consistently low with a mean of 1.1. During maintenance, Kima displayed her highest level of complete sentences, with a mean of 4.3, and a low level of incomplete sentences, with a mean of 0.3.

**Beadie.** Figure 7 displays the amount of simple sentences per 1-minute completed by Beadie across experimental phases. Beadie showed low but consistent performance during baseline. Complete and incomplete sentences showed steady, flat trends with little overlap (celerations = x1.0/16 days; AIM = x1.0/16 days).
During Sentence Instruction, Beadie’s performance data decreased in level of complete sentences, mean of 1.7, and an increase in incomplete sentences, with mean of 1.3. Data paths merged and overlapped on 2 of 3 instructional sessions. During FBPC, complete sentences accelerated in trend (celeration = x1.3/14 days) and reached its highest level. However, incomplete sentences remained high and overlapped consistently with complete sentences (celeration = x1.0/14 days), suggesting a gain in speed but little to no improvement in accuracy (AIM = x1.3/14 days). Paragraph instruction showed increased complete sentences and lower level of incomplete sentences. Beadie achieved her fastest and most accurate performance during maintenance, with means of 4.3 CWS and 0.3 IWS.

**Omar.** Figure 8 displays simple sentences completed per 1-minute across experimental phases by Omar. During baseline Omar consistently displayed zero complete sentences (celeration = x1.0/12 days) and a rising frequency of incomplete sentences (celeration = x2.0/12 days). AIM of both celerations divided by 2.0 across 12 days indicating a substantial worsening of performance.

Little change occurred upon entering Sentence Instruction but data points overlapped on the final instruction session with 2 complete and incomplete sentences. An immediate change in speed and accuracy occurred at the start of the FBPC phase, rising in level to four complete and zero incomplete sentences. Data paths for complete and incomplete sentences showed moderately flat trends (celerations = x1.0/14 days; AIM = x1.0/14 days). The performance data in the last four sessions of FBPC showed a slightly declining trend. The declining trend continued upon entering paragraph instructions and data points overlapped with scores of 2 complete and 2 incomplete
sentences. Subsequent data points stabilized and increased to a high level of accuracy and speed, with means of 3 complete and .67 incomplete sentence. Maintenance showed the highest level of complete sentences and lowest level of incomplete sentences.

**Across Participants.** All participants displayed low accuracy of complete simple sentences during baseline. The multiple baseline design required only one participant at a time enter Sentence Instruction. Staggered introduction revealed that all participants gradually improved accuracy of simple sentences during Sentence Instruction with increased speed during FBPC and Paragraph Instruction phases. All participants displayed maintenance comparable to experimental phases.

**Descriptive Paragraphs: Word Sequences and Sentences Per 3 Minutes**

Table 2 shows results for descriptive paragraphs across time and participants. Across experimental phases, Rhonda showed an increase in accuracy and speed of correct word sequences. The number of word sequences rose from 23 CWS and 24 CWS to 30, 33, and 36 CWS per 3-minutes. IWS decreased from baseline levels. Rhonda attempted more simple sentences but incomplete sentences remained high achieving a score of 0 complete and 3 incomplete following Paragraph Instruction. The experimenter conducted an error analysis of the descriptive paragraphs and found instances of incorrect subject-verb agreement (i.e., Timmy ride a bike) and improper word use (i.e., ain’t and gonna) accounted for 4 of the 7 IWS.

From baseline, Kima increased accuracy of word sequences but not speed. CWS stayed moderately the same across experimental phases but IWS decreased from 5 IWS to 3, 0, and 2 IWS. Sentences showed increases in complete and decrease in incompletes. An error analysis of the descriptive paragraph completed following the last experimental
phase showed all errors stemmed from instances of incorrect capitalization and punctuation.

Beadie showed increased speed and accuracy following baseline. CWS increased, rising from 45 and 31 to 57 and 53 CWS, and IWS decreased. Beadie attempted more sentences following Sentence Instruction but had low accuracy with scores of 2 complete and 5 incomplete in FBPC and 5 complete and 2 incomplete in Paragraph Instruction. An error analysis revealed that half of the errors committed stemmed from incorrect subject-verb agreement.

Omar showed an increase in accuracy but decrease in speed of word sequences from baseline to FBPC. The second baseline measure of 40 CWS and 6 IWS decreased to 22 CWS and 1 IWS. Omar had a comparable high degree of accuracy of word sequences and sentences between FBPC and Paragraph Instruction. Maintenance showed an increase in speed, rising from 22 CWS in Paragraph Instruction to 37, with high accuracy.

**Social Validity**

Following completion of intervention, participants subjectively responded to questions about the goals, procedures, and the outcome of the study. Participants viewed simple sentence writing as a valuable skill. Both Rhonda and Kima reported simple sentences help “show what you know.” Beadie and Omar said simple sentences allowed them, “to become better writers.” All participants reported they enjoyed instruction and would not change anything in instruction or practice, and they also expressed a positive attitude towards their ability to write simple sentences. Omar said, “I feel like I got better.”
To capture a normative comparison to their same grade peers the participants completed the Writing Attitude Survey (Kear et al., 2000). Despite a history of academic struggles, the majority of participants reported a positive attitude towards writing tasks. Three participants scored at a higher percentile rank than their same grade peers: Rhonda scored at the 92nd percentile, Kima at the 75th percentile, and Omar at the 98th percentile. Beadie indicated less enthusiasm to engage in writing tasks with a percentile rank of 44.

Teachers knowledgeable of the participants writing skills subjectively responded to open-ended questions about goals and outcomes of the intervention. Beadie’s teacher said the purpose of sentences writing is “to communicate clear thoughts.” Her teacher felt the intervention helped, “Her sentence logic does shine through for the most part…I feel that she is very weak in grammar skills.” Omar’s teacher responded similarly, “Sentence writing allows writers to state their ideas clearly. I find it easy to identify who/what Omar is talking about but his subject/verb agreement is pretty low.” A teacher for both Kima and Rhonda said, “they have the foundational skills for good writing…they write simple sentences well but it needs to be improved upon.”
Chapter 4

Discussion

The research literature currently lacks interventions designed to help adolescents with difficulty constructing simple sentences achieve learning outcomes of acquisition, fluency, and application. Behavioral fluency research (Binder, 1996; Johnson & Layng, 1992; Kubina & Morrison, 2000) has shown that behaviors, which reach specified levels of speed and accuracy, or fluency, improve proximal and distal outcomes (Bucklin, Dickinson, & Brethower, 2000; Hughes, Beverley & Whitehead, 2007; Kubina, Young & Kilwein, 2004). The present study examined effects of an intervention designed to produce immediate, proximal outcomes of acquisition and fluency of simple sentence construction and correct word syntax with distal application towards paragraphs. To accomplish each outcome, participants completed three experimental phases: Sentence Instruction, Frequency Building to a Performance Criterion (FBPC), and Paragraph Instruction. Dependent variables included word sequences and sentences per 1-minute. To measure application towards descriptive paragraphs, dependent variables were word sentences and sentences per 3-minutes.

The first experimental phase, Sentence Instruction, improved accuracy of all 1-minute dependent variables: word sequences and simple sentences. Three of four participants, everyone except Beadie, showed higher levels of correct word sequences (CWS) and complete sentences and lower proportions of incorrect word sequences (IWS) and incomplete sentences. The frequency of complete sentences proved more resistant to intervention, resulting in small gains of accuracy. Lack of more robust results, however, may partially stem from insensitivity of complete sentence measures to detect small
changes within sentences (McMaster et al., 2011). For example, an incomplete sentence could potentially contain 10 CWS but only 1 IWS.

The Sentence Instruction phase extended findings of prior sentence construction studies. Several studies have successfully used picture-word prompts in combination with additional instructional features (e.g., Anderson & Keel, 2002; Walker et al., 2005; Viel-Ruma et al, 2010). The present study, in addition to findings from an earlier study (Datchuk, Kubina, & Mason, 2011), isolated the effects of picture-word prompts on simple sentence construction. Picture-word prompts proved an efficient method to increase the accuracy of simple sentences and word sequences in a total duration of 90 minutes across three sessions. Part of the efficiency may stem from a reduction in task demands, replacing idea generation typically required by written responses with picture description (Kammenui & Simmons, 1990). Additionally, findings from the present study extend the literature to include simple sentence construction (Datchuk & Kubina, 2011); the majority of sentence construction studies have examined interventions for more complicated sentence constructions, such as compound sentences.

The majority of prior sentence construction studies have examined effects of instruction to achieve the learning outcome of acquisition but not practice procedures to achieve fluency (Datchuk & Kubina, 2010; Rogers & Graham, 2008). However, instruction may lead to only variable, instable accuracy and only short-term gains in skill acquisition. In the present study, Sentence Instruction did produce gradual increases in accuracy but practice procedures to a specific criterion, FBPC, resulted in additional gains in either word sequences or complete sentences.
While very few writing studies have made use of fluency interventions (i.e., Datchuk & Kubina, 2011b; Datchuk, Kubina, & Mason, 2011), all participants achieved fluency in the FBPC phase. The performance criterion of 30 CWS with 0 to 3 IWS for at least two out of three consecutive days proved useful as an indicator of fluency and as a predictor of performance. The highest levels of performance achieved by participants coincided with reaching the performance criterion. The process of reaching the performance criterion through timed trials resulted in fluent simple sentence construction, systematically extending prior studies of behavioral fluency (Johnson & Layng, 1992; Kubina, Amato, Schwilk, & Therrien, 2008).

The experimental phases of Sentence Instruction and FBPC coincided with increased application of word sequences to descriptive paragraphs. Three of four participants, everyone except Beadie, applied higher amounts of word sequences and sentences to descriptive paragraphs prior to entering the Paragraph Instruction phase. This finding suggests that Sentence Instruction and FBPC produced fluent behavior that applied to more complex, compound behavior, similar to prior research (Bucklin, Dickinson, & Brethower, 2000; Hughes, Beverley, & Whitehead, 2007; Kubina, Young, & Kilwein, 2004).

During the Paragraph Instruction phase all participants increased accuracy of word sequences and complete sentences per 1-minute but not per 3-minutes. Performance increases on 1-minute measures may have resulted from prior experimental phases of Sentence Instruction and FBPC. Paragraph Instruction focused on identification and correction of run-on sentences and paragraph construction meaning gains should
have most likely occurred on 3-minute dependent variables, which provided a measure of paragraph construction.

The Paragraph Instruction phase, however, did not result in further increases in frequency of complete sentences per 3-minutes, or in other words participants did not construct more complete sentences within paragraphs. Accuracy of word sequences per 3-minutes showed continued growth but constructing complete simple sentences fluctuated and showed no clear increase. An analysis of descriptive paragraphs revealed several skills not addressed by the intervention accounted for the most errors, namely incorrect subject-verb agreement and grammatically incorrect words. Confirming continued struggles, teachers of two participants noted concerns surrounding subject-verb agreement during social validity interviews.

Fluent behaviors of complete sentences and CWS persisted across time, replicating prior sentence construction studies that found similar results for simple and compound sentences (e.g., Datchuk & Kubina, 2011b; Datchuk, Kubina, & Mason, 2011). All participants showed their highest performance of word sequences or sentences during maintenance, occurring approximately 30, 31, and 32 days following the last experimental phase. Maintenance data from the present study suggests that experimental phases produced lasting, beneficial change of writing behavior for all participants.

Furthermore, the intervention produced efficient and lasting change of linguistic skills (Berninger et al., 1992) for participants. The intervention improved linguistic skills in two ways: it increased construction of simple sentences and the amount of words used with appropriate syntax and punctuation. Prior to intervention, all participants lacked linguistic skills of simple sentence construction and syntax but displayed adequate
neurodevelopment, as indicated by fluent handwriting and spelling. Handwriting and spelling exerted a positive constraint on performance. In other words, the ability to quickly and legibly produce correctly spelled words allowed participants to fully benefit from sentence instruction and FBPC.

To detect linguistic growth, celeration values (Graf & Lindlsey, 2002) and the Accuracy Improvement Measure (AIM; Pennypacker, Guiterrez, & Lindsley, 2003) augmented visual analysis and provided precise metrics for quantifying changes in frequency from baseline through FBPC phases. AIM provided valuable insight in addition to the celeration values. For example, Kima and Omar had CWS celeration values multiplying by 1.1 and 1.3 during baseline, giving the false impression of improving performance. The AIM compared concurrent celerations of CWS and IWS and revealed performance worsened, respectively dividing by 1.2 and 1.8 for both participants. Additionally, celeration values and AIM helped interpretation of experimental effect for Rhonda and Beadie. A comparison of Rhonda’s CWS and IWS during FBPC revealed drastic changes in accuracy, with an AIM multiplying by 3.6 across 11 days. Beadie did display slight growth of CWS during FBPC; however, acceleration of IWS suggested a decrease in overall accuracy.

Overall changes in celeration value, level, and AIM suggest a functional relationship between the package of independent variables and the 1-minute dependent variables. The multiple baseline experimental design showed a replication of experimental effects across all participants on the speed and accuracy of simple sentences constructed per 1-minute. Only three of four participants consistently improved CWS per 1-minute from baseline levels.
CWS per 1-minute did not improve for Beadie. She displayed higher amounts of IWS within Sentence Instruction and FBPC. Beadie did, however, increase accuracy and speed of complete sentences across experimental phases. The difference between performance in sentences and word sequences, accuracy decreasing in CWS but increasing for in complete sentences, means that IWS tended to cluster in only a few sentences and Beadie constructed more sentences without any IWS. Two reasons may explain the lack of more robust CWS measures for Beadie. First, she displayed high accuracy during baseline limiting potential for further growth in the Sentence Instruction phase. Second, the experimenter analyzed errors committed by Beadie and found that approximately 70% of IWS resulted from inappropriate subject-verb agreement. The skill of subject-verb agreement fell outside the scope of intervention; no experimental phase explicitly addressed this skill.

**Limitations and Future Directions**

The duration of the study limited the amount of descriptive paragraph samples. Collecting a larger amount of paragraph samples would allow detection of a functional relationship between the independent and dependent variables. Future researchers should extend the experimental design to include collection of at least three paragraph assessments within each experimental phase following recommendations by What Works Clearinghouse (Kratchowill et al., 2010).

The study found only three of four participants replicated experimental effects across dependent variables. One participant, Beadie, showed improvement only on complete sentences but not CWS. Beadie displayed a high amount of errors in subject-verb agreement during intervention. This skill fell outside the scope of intervention but
several reviews of the writing literature have recommended addressing grammar skills within lessons of sentence construction (Datchuk & Kubina, 2011a; Graham & Perin, 2007). Future research should incorporate lessons on subject-verb agreement to potentially increase effectiveness of the intervention. Researchers could slightly extend duration of instruction to include a focus on subject-verb agreement.

Last, the performance criterion set for the FBPC phase came from a prior study that collected writing samples from a small subset of students (Datchuk, Kubina, & Mason, 2011). Some variance across samples may occur and possibly effect future studies. For example, researchers might find lower performance criterion produce similar results. Conversely, higher criterion may lead to additional gains in performance. Future research should study effects of altering the criterion to higher or lower frequencies and closely inspect the subsequent learning outcomes.

**Implications for Practice**

Findings from the present study and prior sentence construction research (Datchuk & Kubina, 2011a; Rogers & Graham, 2008) suggest teachers could potentially and efficiently teach sentence writing. Instruction and practice procedures should focus on developing accurate and fluent sentence construction skills. Students who have proficient handwriting and spelling skills may benefit most from intervention and display consistent and enduring gains in sentence writing. Application of word sequences, but not simple sentences, to paragraphs may modestly increase.

**Summary**

The present study achieved learning outcomes of acquisition, fluency, and application for adolescents with difficulty constructing simple sentences. Based on the
Instructional Hierarchy (Haring & Eaton, 1978) of learning outcomes of acquisition, fluency and application, the intervention entailed sequential delivery of three experimental phases, Sentence Instruction, FBPC, and Paragraph Instruction. All three experimental phases improved linguistic skills of simple sentences and appropriate word use. The majority of participants displayed proximal and distal gains in word sequences and complete simple sentences with application to descriptive paragraphs. Instances of incorrect grammar comprised the majority of errors in descriptive paragraphs. Future research will have to focus on ways to make application more robust.
References


Appendix A

Tables

Table 1

Example of responses scored for correct or incorrect word sequences and complete or incomplete sentences

<table>
<thead>
<tr>
<th>Scores</th>
<th>Responses</th>
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<tr>
<td>CWS = 8, IWS = 0</td>
<td>(^\wedge) Tim (^\wedge) rode (^\wedge) a (^\wedge) skateboard (^\wedge) in (^\wedge) the (^\wedge) street (^\wedge).</td>
</tr>
<tr>
<td>Complete Sentence</td>
<td></td>
</tr>
<tr>
<td>CWS = 3, IWS = 4.</td>
<td>(^x) tim (^x) rided (^x) a (^x) skateboard (^x) the (^x) street (^x).</td>
</tr>
<tr>
<td>Incomplete Sentence</td>
<td></td>
</tr>
</tbody>
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Table 2

**Participant characteristics**

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<th>Beadie</th>
<th>Omar</th>
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<td>SLD</td>
<td>SLD</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Terra Nova</td>
<td>Reading SS (% tile)</td>
<td>656 (30)</td>
<td>628 (13)</td>
<td>616 (13)</td>
<td>498 (1)</td>
</tr>
<tr>
<td></td>
<td>Language SS (% tile)</td>
<td>633 (17)</td>
<td>614 (9)</td>
<td>623 (19)</td>
<td>N/A</td>
</tr>
<tr>
<td>WJ-R III</td>
<td>Writing Fluency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subtest SS (%tile)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentence Writing</td>
<td>CWS (IWS)</td>
<td>19 (4)</td>
<td>20 (0)</td>
<td>11 (0)</td>
<td>7 (3)</td>
</tr>
<tr>
<td>Handwriting</td>
<td>Complete (Incomplete)</td>
<td>0 (4)</td>
<td>3 (0)</td>
<td>0 (2)</td>
<td>0 (2)</td>
</tr>
<tr>
<td></td>
<td>CLPM</td>
<td>85</td>
<td>100</td>
<td>108</td>
<td>122</td>
</tr>
</tbody>
</table>

*Note. F = female, M = male. AA = African-American. SLD = specific learning disability, Mild ID = mild intellectual disability. SS= standard score, %tile = percentile score. WJ-R III = Woodcock-Johnson III. CWS = correct word sequences, IWS = incorrect word sequences. CLPM = correct letters per minute.*
Table 3

*Mean Correct and Incorrect Word Sequences and Complete and Incomplete Simple Sentences Over Time*

<table>
<thead>
<tr>
<th>Student</th>
<th>Phase</th>
<th>Word Sequences CWS</th>
<th>Word Sequences IWS</th>
<th>Simple Sentences Comp.</th>
<th>Simple Sentences Incomp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhonda</td>
<td>Baseline</td>
<td>19.7</td>
<td>5.8</td>
<td>0</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>Sentence Instruction</td>
<td>22.3</td>
<td>3.7</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>23.6</td>
<td>2.8</td>
<td>3.1</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>25.3</td>
<td>1.0</td>
<td>4</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>29.3</td>
<td>2.3</td>
<td>3.3</td>
<td>2</td>
</tr>
<tr>
<td>Kima</td>
<td>Baseline</td>
<td>22</td>
<td>3.9</td>
<td>1.4</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>Sentence Instruction</td>
<td>22.7</td>
<td>3.3</td>
<td>2.7</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>26.2</td>
<td>1.2</td>
<td>3.6</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>20</td>
<td>0</td>
<td>3.3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>25.3</td>
<td>0.7</td>
<td>4.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Beadie</td>
<td>Baseline</td>
<td>18.8</td>
<td>1.2</td>
<td>2</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Sentence Instruction</td>
<td>23.7</td>
<td>3</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>24.7</td>
<td>2.4</td>
<td>2.8</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>29</td>
<td>1.3</td>
<td>3.7</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>31</td>
<td>0.3</td>
<td>4.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Omar</td>
<td>Baseline</td>
<td>10.3</td>
<td>5.6</td>
<td>0</td>
<td>3.25</td>
</tr>
<tr>
<td></td>
<td>Sentence Instruction</td>
<td>18.7</td>
<td>7.3</td>
<td>.67</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>22.3</td>
<td>1.4</td>
<td>3.11</td>
<td>.56</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>23</td>
<td>1</td>
<td>3</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>30.3</td>
<td>1</td>
<td>3.3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

*Note.* CWS = correct word sequences, IWS = incorrect word sequences, Comp. = complete sentences, Incomp. = incomplete sentences
Table 4

Descriptive Paragraphs Over Time: Correct and Incorrect Word Sequences and Complete and Incomplete Sentences with Percentage Correct

<table>
<thead>
<tr>
<th>Student</th>
<th>Phase</th>
<th>Word Sequences</th>
<th>Simple Sentences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CWS</td>
<td>IWS</td>
</tr>
<tr>
<td>Rhonda</td>
<td>Baseline 1</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Baseline 2</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Sentence Instruction</td>
<td>30</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>33</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>36</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>39</td>
<td>7</td>
</tr>
<tr>
<td>Kima</td>
<td>Baseline 1</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Baseline 2</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Sentence Instruction</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>29</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>Beadie</td>
<td>Baseline</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Baseline 2</td>
<td>31</td>
<td>10</td>
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<tr>
<td></td>
<td>Sentence Instruction</td>
<td>57</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>53</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>53</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Omar</td>
<td>Baseline</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Baseline 2</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Sentence Instruction</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Paragraph Instruction</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>37</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. CWS = correct word sequences, IWS = incorrect word sequences, Comp. = complete sentences, Incomp. = incomplete sentences, % = percentage correct.
Figure 1. Rhonda's word sequences per 1-minute across experimental phases.

B = Baseline
SI = Sentence Instruction
FBPC = Frequency Building to a Performance Criterion
PI = Paragraph Instruction
M = Maintenance

Celeration Values and AIM by Phase

Baseline
CWS: +1.1/8 days
IWS: x1.2/8 days
AIM: +1.3/8 days

FBPC
CWS: x1.3/11 days
IWS: +3.0/11 days
AIM: x3.6/11 days
Figure 2. Kima’s word sequences per 1-minute across experimental phases.

B = Baseline
SI = Sentence Instruction
FBPC = Frequency Building to a Performance Criterion
PI = Paragraph Instruction
M = Maintenance

Celeration Values and AIM by Phase

Baseline
CWS: x1.1/11 days
IWS: x1.3/11 days
AIM: ÷1.2/11 days

FBPC
CWS: x1.1/7 days
IWS: x1.0/7 days
AIM: x1.1/7 days
Figure 3. Beadie's word sequences per 1-minute across experimental phases.

B = Baseline
SI = Sentence Instruction
FBPC = Frequency Building to a Performance Criterion
PI = Paragraph Instruction
M = Maintenance

Celeration Values and AIM by Phase

Baseline
CWS: x1.0/16 days
IWS: x1.0/16 days
AIM: x1.0/16 days

FBPC
CWS: x1.2/14 days
IWS: x1.5/14 days
AIM: ÷ 1.3/14 days
Figure 4. Omar's word sequences per 1-minute across experimental phases.

B = Baseline
SI = Sentence Instruction
FBPC = Frequency Building to a Performance Criterion
PI = Paragraph Instruction
M = Maintenance

Celeration Values and AIM by Phase

Baseline
CWS: x1.3/12 days
IWS: x2.3/12 days
AIM: ÷ 1.8/12 days

FBPC
CWS: x1.1/14 days
IWS: ÷ 2.0 /14 days
AIM: x2.2/14 days
Figure 5. Rhonda's simple sentences per 1-minute across experimental phases.

B = Baseline
SI = Sentence Instruction
FBPC = Frequency Building to a Performance Criterion
PI = Paragraph Instruction
M = Maintenance

Celeration Values and AIM by Phase

Baseline
Complete: x1.0/8 days
Incomplete: x1.0/8 days
AIM: x1.0/8 days

FBPC
Complete: x1.5/11 days
Incomplete: ÷ 2.0/11 days
AIM: x3.0/11 days
Figure 6. Kima's simple sentences per 1-minute across experimental phases.

B = Baseline
SI = Sentence Instruction
FBPC = Frequency Building to a Performance Criterion
PI = Paragraph Instruction
M = Maintenance

Celeration Values and AIM by Phase

Baseline
Complete: ∆2.0/11 days
Incomplete: x1.5/11 days
AIM: ∆3.0/11 days

FBPC
Complete: x1.3/7 days
Incomplete: x1.0/7 days
AIM: x1.3/7 days
Figure 7. Beadie's simple sentences per 1-minute across experimental phases.

- B = Baseline
- SI = Sentence Instruction
- FBPC = Frequency Building to a Performance Criterion
- PI = Paragraph Instruction
- M = Maintenance

Celeration Values and AIM by Phase

Baseline
- Complete: $x_{1.0}/16$ days
- Incomplete: $x_{1.0}/16$ days
- AIM: $x_{1.0}/16$ days

FBPC
- Complete: $x_{1.3}/14$ days
- IWS: $x_{1.0}/14$ days
- AIM: $x_{1.3}/14$ days
Figure 8. Omar's simple sentences per 1-minute across experimental phases.

B = Baseline
SI = Sentence Instruction
FBPC = Frequency Building to a Performance Criterion
PI = Paragraph Instruction
M = Maintenance

Celeration Values and AIM by Phase

Baseline
Complete: x1.0/12 days
Incomplete: x2.0/12 days
AIM: ÷ 2.0/12 days

FBPC
Complete: x1.0/14 days
Incomplete: x1.0/14 days
AIM: x1.0/14 days

Sentences Per Minute

SUCCESSIVE CALENDAR DAYS

Richard M. Kubina
ADVISER
The Pennsylvania State University
AGENCY

Shawn Datchuk
MANAGER

Shawn Datchuk
TIMER

Observer 1
COUNTER

Omar
PERFORMER

Shawn Datchuk
CHARTER

Complete and Incomplete Sentences COUNTEd
Appendix C

Review of Relevant Literature

A Review of Teaching Sentence Level Writing Skills to Students with Writing Difficulties and Learning Disabilities

Many social, academic, and vocational outcomes require proficient written expression. Individuals increasingly use electronic correspondence through e-mail or blogs to communicate socially (Boyd, 2008). Proficient written expression also correlates to success in writing and reading intensive undergraduate classes (Arum, Roksa, & Cho, 2011) and salaried employment and promotion (National Commission on Writing, 2004). Furthermore school students from primary to high school grades use written expression to communicate academic knowledge on statewide assessments mandated by No Child Left Behind (NCLB, 2001). NCLB mandated assessment of all students, regardless of exceptionality, towards grade-level state standards (Cho & Kingston, 2011).

On broad measures many students achieve only a basic or below knowledge of written expression. In 2007, 6% of eighth-grade students with disabilities and 34% of typically developing students scored proficient or above on the writing subtest of the National Assessment of Educational Progress. Performance further decreases in upper grade levels. In twelfth-grade, 5% of students with exceptionalities scored proficient or above, compared to 26% of typically developing students (U.S. Department of Education Institute of Education Sciences, National Center for Educational Statistics, 2009).

Intervention researchers have found that many struggling writers or writers with learning disabilities (LD) have not acquired appropriate strategies and skills and report
low motivation to engage in writing tasks (Graham & Harris, 2009). During composition, students with LD display nonfluent handwriting (Weintraub & Graham, 1998) and construct short, choppy, or incomplete sentences with numerous errors in spelling, punctuation, grammar, and capitalization (Kline, Schumaker, & Deshler, 1991; Newcomer & Barenbaum, 1991).

**Constraints to Proficient Written Expression**

Berninger and colleagues (1992) suggest the path to proficient written expression rests on three, dynamic and interactive levels of writing development: neurodevelopment, linguistics, and cognitive. Neurodevelopment describes the physical and neurological maturation needed for visual-motor tasks of handwriting and spelling. Linguistic constraints are sentence level skills needed to produce letters, words, and sentences of appropriate syntax. Cognitive constraints refer to skills of composing extended text and strategies to regulate the writing process.

The three levels of development form an interactive system of written expression: levels interact with each other, maintaining conservative growth and preventing drastic changes in written expression. For example, difficulty with visual-motor development constrains written expression to a low frequency and results in more difficulty acquiring handwriting and spelling. Conversely, adequate neurodevelopment constrains written expression to a moderate-high frequency, making acquisition of handwriting easier in comparison. Given multiple constraints to proficient written expression, the research literature stands to benefit from efficient and pervasive interventions that target gains in sentence level skills at the linguistic level and distally effect related sentence level and cognitive skills. Kammenui and Simmons (1990) proposed that researchers and
practitioners view constraints along a continuum of component-composite skills. Writing constraints have smaller component skills that build into larger composite skills and repertoires. Smaller component skills of linguistics begin at the sentence level. Some sentence level skills include grammar/usage, sentence construction, and handwriting (Graham, 2006). Grammar/usage includes conventions of appropriate grammar, punctuation, and capitalization. Sentence construction occurs when writers arrange words or phrases into sentence types, such as simple or compound sentences. Handwriting refers to legible transcription of letters.

Prior reviews of the literature have typically investigated effects of intervention on a single or a few sentence level skills. Several meta-analyses found students benefited from instruction on sentence construction (Graham & Perin, 2007; Hillock, 1986; Mason & Graham, 2008; Rogers & Graham, 2008) and capitalization and punctuation (Rogers & Graham, 2008), but found mixed results on grammar instruction (Graham & Perin, 2007; Rogers & Graham, 2008). Additionally, in a narrative review of the handwriting literature, Graham and Weintraub (1996) found increased performance following direct instruction of handwriting that presented visual and verbal models of letter formation. No review has collective synthesized the sentence level skill literature, including grammar/usage, sentence construction, and handwriting.

The literature stands to benefit from a narrative review of the intervention literature on sentence level skills for students with difficulties or exceptionalities. A narrative review synthesizes results and intervention components across a range of design types, including single-case, group, or quasi-experimental studies. The process of aggregating results into a single effect size makes it difficult for meta-analyses to include
studies of a full range of design types. Additionally, the primary effect size used to aggregate single-case research, percentage of non-overlapping data, has come under increasing scrutiny for potential inaccuracies in detecting experimental effects (Wolery et al., 2010). A narrative review of the literature avoids these complications in favor of a descriptive delineation of each study. Precisely identifying the results and intervention components across studies may lead to recommendations useful to practitioners and test the boundaries of an assumed relationship between component and composite writing skills.

The present narrative literature review synthesized effects of intervention on sentence level skills of handwriting, sentence construction, and grammar/usage. The review sought to answer two main questions. What interventions have researchers used to teach sentence level writing skills to students with writing difficulties or learning disabilities? What effect has intervention had on sentence level skills, component skills, and transfer of those skills to more complicated, composite tasks?

Method

Location and Selection of Articles

Studies included for review had to meet four criteria. First, studies used an experimental, quasi-experimental, or single-case research design with quantitative results. Second, studies directly manipulated an independent variable designed to teach grammar/usage, sentence construction, or handwriting. Given a previous review of the handwriting literature (Graham & Weintraub, 1996), the review did not include handwriting studies published prior to 1994. Third, participants enrolled in grades K-12 and received special education services for LD. Participants with writing difficulties in
grades K-4 also met inclusion criteria because referral for special education services tend not to emerge until upper elementary grades (Berninger & Amtmann, 2003; Levine, Okerlaid, & Meltzer, 1981). This review relied on each study to define participant characteristics of LD and writing difficulties. Fourth, the article appeared in a peer-reviewed journal.

The search process consisted of four distinct phases. An electronic search of PsychInfo and ERIC databases included descriptors related to expressive writing: alphabetic, alphabets, basic skills, basic writing, capitalization, context free grammar, duplication, Grammar, handwriting, handwriting legibility, printing, punctuation, sentences, sentence diagramming, sentence structure, writing ability, written communication, writing composition, writing exercises, writing instruction, writing research, writing skills, academic failure, at risk populations, disabilities, learning disabilities, learning disorders, and writing difficulties. The search revealed 998 articles. The lead author read the abstract of each article and retained articles that met the above criteria. In addition several articles did not quality that investigated effects of concurrent spelling intervention (Berninger, Abbott, Whitaker, & Sylvester, 1995; Berninger et al., 2002; Brooks, Vaughan, & Berninger, 1999), accommodations of extended time, (Crawford, Helwig, & Tindal, 2004) and student graphing of performance (Kasper-Ferguson & Moxley, 2002; Stotz, Itoi, Konrad, & Alber-Morgan, 2008)

Seventeen articles met inclusion criteria. Next, a hand search of all journals that contained an identified article revealed two additional articles meeting criteria. An ancestral search of identified articles revealed no additional articles meeting inclusion criteria. A total of 19 articles met inclusion criteria.
Following location and selection of articles, coding for each study fell into three distinct categories used in prior studies and literature reviews (Berninger, Cartwright, Yates, Swanson, & Abbott, 1994; Graham & Perin, 2007; Hillocks, 1986; Rogers & Graham, 2008). Handwriting encompassed teaching participants legible formation of alphabetic letters or words. Sentence construction studies delivered instruction or taught use of a strategy and reported measures of sentences or word sequences. For grammar/usage studies, students were taught skills or grammar, punctuation, and/or capitalization. Studies reporting measures for more than one skill received a multiple categories code. The final categorizes included grammar and usage (3 studies), sentence construction (9 studies), and handwriting (10 studies). A rater trained on category definitions independently coded studies. Agreement ran 100% across studies.

**Evaluating Effects of Intervention**

To evaluate effects of interventions using group designs, the authors calculated an effect size or Cohen’s d for each individual study but did not aggregate effect sizes across studies into a single statistic as commonly found in meta-analyses. The effect size took difference in means of a single group from pretest to posttest or between two groups at posttest divided by the pooled standard deviation (Lipsey & Wilson, 2001). General guidelines to interpret significance of the effect size include .20 as small, .50 as medium, and .80 as large (Cohen, 1988). The authors described effects of intervention when studies did not report the statistics needed to calculate effect size.

For single-case designs, the authors evaluated effects by looking for multiple replications of experimental control across behaviors and/or participants (Horner et al., 2005; Kratochwill et al., 2010). A functional relationship occurs when the introduction
of an independent variable corresponds to a predictable and consistent change in the dependent variable. Due to concerns with several statistics used to evaluate replications within single-case designs, experimenters used visual analysis of data on graphic displays to discern replications. Kazdin (2011) suggested visual analysis for changes in magnitude and rate. Magnitude refers to changes in mean or average across experimental phases and level or immediate increases or decreases following intervention. Rate refers to the direction, increase or decrease, and the degree or steepness of trend.

Results

This section presents results according to categories of handwriting, sentence construction, and grammar/usage. Each category describes study and participant characters then intervention components.

Handwriting

Study and participant characteristics. Ten studies investigated effects of intervention on handwriting (Berninger et al., 1997; Berninger et al., 2006; Burns, Gauza, & London, 2009; Graham, Harris, & Fink, 2000; Jones & Christensen, 1999; Mackay, McCluskey, & Mayes, 2010; Sudsawad, Trombly, Henderson, & Tickle-Degnen, 2002; Veena, Romate, & Bhogle, 2002; Zwicker & Hadwin, 2009). Table 1 summarizes participant and study characteristics and results. Handwriting studies included a total of 394 participants. All participants were enrolled in elementary and primary grades. The age of participants ranged from a mean of 6 to 10 years. Researchers described all participants as struggling in handwriting.

Dependent variables used to measure handwriting performance prior to intervention varied across studies. Six studies included students with low scores on
alphabet and copy tasks (Berninger et al., 1997; Berninger et al., 2006; Jones & Christensen, 1999; Veena, 2002; Zwicker & Hadwick, 2009). Alphabet tasks required students to sequentially write alphabet letters from memory and copy tasks required students to copy letters of the alphabet or text taken from grade level passages. Two studies (Mackay et al., 2010; Sudsawad, et al. 2002) included students nominated by teachers as having difficulty and displaying below average performance on the Kinesthetic Sensitivity Test (Laszlo & Bairstow, 1985) and the Minnesota Handwriting Assessment (Reisman, 1999).

**Intervention components.** Handwriting is defined as the legible formation of alphabetic letters (Graham & Weintraub, 1996). Multiple processes support handwriting (Berninger et al., 1992): orthographic coding, fine motor, and visual-motor processes. To form alphabetic letters, writers must store images of the alphabet and words in memory, known as orthographic coding, transcribe the letters using fine motor processes, and adjust motor movement according to visual input (e.g., legibility and writing within margins). Handwriting studies varied on their focus, either teaching letter formation or expanding to one of the related processes.

**Letter formation.** Two studies focused on teaching letter formation. Berninger et al. (1997) found a combination of memory retrieval and visual cues resulted in the highest performance across time on an alphabet task (effect size = 1.71) and copy task (effect size = 1.12). Visual cues featured numbers and arrows surrounding each letter to prompt correct letter formation and sequence. Memory retrieval required participants to examine a fully formed letter before covering it up for an increasing amount of time.
Participants wrote the letter from memory and following a delay, uncovered the model letter to compare for accuracy.

Burns and colleagues (2009) successfully used a cover-copy-compare (CCC) approach to letter formation, similar in topography to memory retrieval, with one participant across three sets of distinct alphabetic letters. The participant viewed a model of correct letter formation, covering the model, copying it from memory, and compared it to the original model. If the copied letter compared favorably to the model, then the participant transcribed the letter five additional times.

**Letter formation and orthographic coding.** Two studies intervened on letter formation and the related process of orthographic coding. One study (Graham et al., 2000) emphasized visual cues of arrows and numbered strokes to guide correct letter formation. To teach orthographic coding, participants sang the alphabet with and without prompting and orally responded to sets of letters with the names of letters before or after the set. At posttest, alphabet task scores differed significantly from a control group that received phonological awareness instruction (effect size = 1.17).

Jones and Christensen (1999) delivered a similar letter formation intervention but orthographic coding procedures differed slightly. For orthographic coding, participants had to write missing letters within an alphabetic sequence. Across time the alphabet sequence contained more blanks for participants to fill with the correct letter. Prior to intervention participants in the intervention group differed significantly from a control group of high performing writers on the alphabet task, however, no difference remained at posttest (effect size = 2.09).
**Letter formation and motor intervention.** Three studies investigated the benefits of adding a motor-process component to handwriting interventions. The first study of a multiple study article (Berninger et al., 2006) found participants that received instruction in letter formation displayed faster speed but less accuracy on an alphabet task than a group that received multiple interventions of letter formation, motor skills, and orthographic coding. Motor intervention included activities designed to impact hand strength, kinesthetic awareness in fingers and hands, dexterity, and motor planning. The second study in the article Berninger et al. (2006) separated effects of motor skill from orthographic coding but found no difference.

Veena and colleagues (2002) delivered motor intervention and tangible reinforcement contingent upon performance in addition to letter formation instruction. The authors stated use of motor interventions to improve muscular control and eye-hand coordination but did not provide detailed procedures. Experimenters adapted a rubric from the Test of Written Language (TOWL-2: Hammil & Larsen, 1988) to provide a holistic score on handwriting. At posttest, both treatment groups that received instruction or instruction with tangible reinforcement outperformed a control group of no treatment (effect size = 3.22).

MacKay, McCluskey, and Mayes (2010) combined motor and handwriting instruction. Motor intervention included kinesthetic activities such as finger movements and multisensory activities like clay manipulation and letter tracing in rice kernels. During handwriting, participants copied letters, words, and sentences. Instruction featured visual cues of lines, dots, and images to prompt correct letter height and spacing. For example, participants transcribed letters between two lines that looked like wooden
logs and a finger puppet image prompted correct spacing between words. Participants increased in legibility of copy tasks on the Minnesota Handwriting Assessment (Reisman, 1999) from pretest to posttest (effect size = 1.59) but decreased in speed.

**Letter formation or motor intervention.** Two studies compared handwriting outcomes from participants that received either motor intervention or letter formation. Sudsawad and colleagues (2002) had participants complete activities designed to improve kinesthetic movement or the position and sensation of body parts without visual input. Activities included identifying the height of various arm positions and tracing stencil patterns without the benefit of viewing the stencil or coordinating eyesight with hand movements. For handwriting instruction, participants copied individual letters, words, and sentences and received feedback on incorrect letter formation from the instructor. At posttest, the handwriting group improved slightly on word legibility in comparison to the fine-motor group (effect size = .13) but scored lower on letter legibility (effect size = -.11) as measured by a composite score that combined results from alphabet and copy tasks (Amundson, 1995). The scores failed to differ from a control group that received no intervention.

One study (Zwicker & Hadwin, 2009) compared motor instruction to handwriting with orthographic coding. Motor instruction focused on multi-sensory activities with various tactile sensations. Participants traced letters with an index finger on different surfaces, such as sand, cornmeal, or on letters written in glue or glitter. Instruction in handwriting and orthographic coding replicated procedures from Graham and colleagues (2000). Compared to a control group that received no intervention, the handwriting with orthographic coding group (effect size = .50) and motor intervention group (effect size =
.39) scored higher at posttest on a composite measure of alphabet and copy tasks (Amundson, 1995). Scores did not differ significantly, however, from the control.

**Sentence Construction**

Nine studies investigated the effects of intervention on sentence construction (Anderson & Keel, 2002; Bui, Schumaker, & Deshler, 2006; Dowis & Schloss, 1992; McCurdy, Skinner, Walton, & Shriver, 2008; Saddler, Asaro, & Behforooz, 2008; Saddler, Behforooz, & Asaro, 2008; Saddler & Graham, 2005; Viel-Ruma, Houchins, Jolivette, Fredrick, & Gama, 2010; Walker, Shippen, Alberto, Houchins, & Cihak, 2005). Table 2 summarizes participant demographics, study characteristics, and results. Studies included a total of 207 participants. The majority of participants enrolled in primary and middle school grades with a few studies including high school students. The age of participants ranged from a mean of 9 to 17 years. All studies but one (Saddler & Graham, 2005) specifically included students with disabilities. Prior to intervention participants across studies displayed similar performance on measures of written expression.

Five studies (Saddler, Asaro, & Behforooz, 2008; Saddler, Behforooz, & Asaro, 2008; Saddler & Graham, 2005; Viel-Ruma et al., 2010; Walker et al., 2005) found low performance on the *Test of Written Language-3* (TOWL-3; Hammill & Larsen, 1996). Also, participants wrote very few complete sentences when compared to their typically developing peers, (Bui, Schumaker, & Deshler, 2008; McCurdy, Skinner, Watson, & Shriver, 2008) and had low percentages of complex sentences (Dowis & Schloss, 1992). Two studies noted low amounts of correct word sequences (CWS). CWS serves as a
sensitive, global measure of writing performance (McMaster et al., 2011) and calculates instances of correct capitalization, spelling, and syntactically appropriate words.

**Intervention components.** Studies included for review either started intervention on simple sentences before progressing to more complicated sentence types or started with more complicated sentences. Simple sentences contain at least one subject and predicate. More complicated constructions include compound or complex sentences. Compound sentences have at least two simple sentences combined together with a conjunction and comma. Complex sentences feature at least one simple sentence joined together with a dependent phrase, such as a phrase that describes when or why an action occurred.

**Starting with simple sentences.** Four studies found improved syntactic and sentence performance following instruction that featured model-lead-test formats (Archer & Hughes, 2010). Three of the model-lead-test studies (Anderson & Keel, 2002; Viel-Ruma et al., 2010; Walker et al., 2005) used commercially available programs (Adams & Engelmann, 1996). Instructors modeled simple sentence construction with picture-word prompts. For example, participants saw a picture of a female carrying logs with the words ‘Sara’ and ‘logs.’ Using the prompted words, participants vocally described pictures, and instructors provided immediate error correction. If vocal responses proved correct, then participants transcribed their responses onto paper. Instructors gradually faded assistance until participants transcribed sentences without having to provide a vocal response beforehand. Sentence constructions gradually became more sophisticated, progressing to compound and complex constructions, as instructors taught irregular verb
usage, subject-verb agreement, and appropriate capitalization and punctuation.
Participants eventually acquired either compound or complex sentence types.

McCurdy and colleagues (2008) also used the model-lead-test instructional format
(Archer & Hughes, 2010) as part of a multi-component intervention to teach simple
sentences, sentences with adjectives, and compound sentences across three classrooms.
Instead of using picture-word prompts, instructional materials presented examples of
complete and incomplete sentences. Following instruction, participants chose one of two
story starters and wrote an extended composition. Instructors graded compositions for
the percentage of complete sentences, adjectives, and compound sentences. Participants
received individual feedback on performance and instructors posted classroom averages
from each composition within the classroom. Participants received reinforcement
contingent upon classroom averages.

One study (Bui et al., 2006) used Fundamentals of Sentence Writing (Schumaker
& Sheldon, 1991) to teach simple and compound sentence construction. Following
procedures from the Strategic Instruction Model (Deshler & Schumaker, 1988),
instructors modeled the PENS MARK writing strategy and gradually faded assistance to
guided and independent application of the strategy. PENS MARK stood for Pick a
sentence formula, Explore words to fit the formula, Note the words, Search and check,
Mark out the imposters, Ask if there is a verb, Root out the subject, and Key in on the
beginning, ending, and meaning. Participants who received the intervention increased
significantly on the proportion of complete sentences (effect size = 1.64) and the
proportion of complicated sentences (effect size = 1.18) from pretest to posttest. In
comparison, a control group that received no intervention decreased in the proportion of complete sentences and showed no improvement on complicated sentences.

**Starting with complicated sentences.** Four studies began instruction with complicated sentence constructions and found increased performance. Three studies (Saddler, Asaro, & Behforooz, 2008; Saddler, Behforooz, & Asaro, 2008; Saddler & Graham, 2005) used sentence-combining techniques to produce gains in complicated sentences. Instructors modeled combining two or more simple sentences, called kernel sentences, with connectors. Connectors included adjectives, underlined phrases within kernels, and conjunctions. In each study students partnered into same skilled or different skilled dyads. Dyads followed protocols from peer assisted learning strategies (D. Fuchs, Fuchs, Mathes, & Simmons, 1997). One partner served as the ‘player’ and the other served as ‘coach.’ The coach provided feedback and encouragement during practice and partners alternated roles.

Saddler and Graham (2005) paired less skilled writers with more skilled writers into instructional dyads. Less skilled writers who received sentence combining instruction significantly outperformed less skilled writers who received grammar instruction at posttest on the TOWL-3 sentence combining subtest (effect size = .83). Two other sentence combining studies (Saddler, Asaro, & Behforooz, 2008; Saddler, Behforooz, & Asaro, 2008) paired students with LD into dyads and found similar results.

Using a similar technique to sentence combining, Dowis and Schloss (1992) taught complex sentences construction to four students with LD. Instructors provided a rule that adverbial phrases tell when, how, or where an action occurred. Participants created complex sentences by generating adverbial phrases to append to complete
sentences. Following intervention in a multiple baseline design, three of the four participants displayed changes in mean, level, and trend on percentage of correct complex sentences found in probes.

**Grammar and Usage**

**Study and participant characteristics.** Three studies investigated effects of grammar/usage instruction (Campbell, Brady, & Lineham, 1991; Dowis & Schloss, 1992; Saddler & Graham, 2005). Table 3 describes participant demographics, study characteristics, and results. Studies included a total of 51 participants. All of the studies included participants enrolled in primary and middle school grades. The age of participants ranged from a mean of 9 to 12 years. Studies used varying measures to describe participant performance prior to intervention. One grammar study noted low-performance on the Sentence Combining subtest from the TOWL-3 (Hammill & Larsen, 1996). Two grammar/usage studies (Campbell, Brady, & Lineham, 1991; Dowis & Schloss, 1992) reported low performance on correct capitalization and possessive use.

**Intervention components.** Two studies taught appropriate rules of usage (Campbell, Brady, & Lineham, 1991; Dowis & Schloss, 1992). Campbell, Brady, and Lineham (1991) taught more-skilled writers to tutor less-skilled writers with LD on correct capitalization rules. Participants acquired either one or two sets of capitalization rules including, capitalizing the first word of each sentence, proper nouns, days of the week, and holidays. Tutors quizzed students on the rules, modeled correct usage of the rules, and guided students during practice. Dowis and Schloss (1992) taught participants correct use of possessives. Instructors modeled correct usage of possessive and guided participants to independent performance.
Only one study investigated effects of grammar instruction (Saddler & Graham, 2005). In a comparison between sentence combining and grammar instruction, researchers paired less skilled writers with more skilled writers into instructional dyads. Instructors modeled identifying several parts of speech: nouns, verbs, adjectives, and adverbs. Once participants acquired the parts of speech, they made incomplete sentences complete by inserting a missing part of speech. Grammar included several parts of speech: nouns, verbs, adjectives, and adverbs. Participants increased from pretest to posttest on the Sentence Combining subtest from the TOWL-3 (effect size = 1.9). Gains fell significantly below a comparison group that received sentence-combining.

**Transfer of Intervention to Linguistics or Cognition**

Three studies (Berninger et al., 2006; Graham et al., 2000; Jones & Christensen, 1999) directly intervened on handwriting and measured transfer to sentence construction and composition. Two studies (Berninger et al., 2006; Graham et al., 2000) measured concurrent increases in sentence construction with the Writing Fluency subtest from the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R; Woodcock & Johnson, 1990). One study (Berninger et al., 2006) found significant growth from pretest to posttest as measured by difference in slope from another treatment group (t =2.57, p = <.05). Graham and colleagues (2000) noted gains from pretest to posttest (effect size = .57) and improved compositional length (effect size = .58).

Additionally, one study (Jones & Christensen, 1999) noted gains in handwriting coincided with gains in compositional quality as measured by an experimenter created rubric that measured four areas: ideas, spelling and grammar, syntax, and fluency. The
rubric had 20 possible points and participants increased in means from 7.42 at baseline to 12.47 following intervention (effect size = 2.34).

All sentence construction studies using sentence-combining techniques (Saddler, Asaro, & Behforooz, 2008; Saddler, Behforooz, & Asaro, 2008; Saddler & Graham, 2005) obtained increases in writing quality as measured by an experimenter created rubric used previously in research (Cooper, 1977; Graham & Harris, 1989). The rubric provided a composite measure of several areas: ideation, organization, grammar, sentence structure, word choice, and mechanics. Despite gains in quality, students tended to use only modest amounts of sentence combinations in extended composition. In a direct comparison of sentence combining and grammar, Saddler and Graham (2005) noted students who received grammar instruction displayed no increase in writing quality.

**Discussion**

This review sought to answer two questions: what interventions have researchers used to teach sentence level writing skills to students with writing difficulties or learning disabilities, and what effect has intervention had on proximal, component skills and more distal, composite tasks? The following section arranges discussion into three categories of handwriting, sentence construction, and grammar/usage. Then the discussion addresses transfer of intervention to other linguistic or cognitive constraints.

**Handwriting**

Before intervention, writers displayed characteristically poor performance on measures shown to correlate well to handwriting development (Berninger et al., 1992), such as alphabet and copy tasks. The similar performance across studies suggests
commonality in how researchers defined writing difficulties and strengthens comparisons between studies.

Consistent with Graham and Weintraub’s (1996) review of the handwriting literature, the vast majority of studies featured models of letter formation. One study compared different types of letter formation models and found visual cues paired with memory retrieval outperformed other model types including visual cues or memory retrieval alone (Berninger et al., 1997). However, the majority of studies reviewed did not include a memory retrieval component. Instruction in letter formation featuring only visual cues consistently lead to increased handwriting performance.

The processes targeted for intervention varied across studies: letter formation, orthographic coding, and motor processes. Interventions targeting letter formation and orthographic coding proved effective but motor-process interventions did not produce significant outcomes. The inability to capture more significant results suggest that participants with writing difficulties, in absence of orthopedic impairment, may benefit more from letter formation and orthographic coding instruction. One study (Veena et al., 2002) found significant results for motor intervention, but researchers should cautiously interpret the study’s large effect size (ES = 3.22). Several problems concerning methodology limit the internal validity of findings, namely failure to report fidelity of intervention and interobserver agreement on the dependent variable.

Sentence Construction

Consistent with findings from several meta-analyses (Graham & Perin, 2007; Hillock, 1986; Rogers & Graham, 2008), the present literature review found improved measures of sentence construction. Students with LD displayed improved sentence
construction following instruction in simple or complicated sentence types. Studies either started intervention on simple sentences before progressing onto complicated sentences or started with complicated sentences.

The majority of studies beginning with simple sentences followed model-lead-test (Archer & Hughes, 2010) instructional formats. Participants read complete and incomplete sentences and responded to picture-word prompts by constructing simple sentences. Picture-word prompts potentially eases difficulty in writing sentences: shifting task demands from idea generation to picture description (Kammenui & Simmons, 1990).

All but one study starting intervention on complicated sentences used sentence-combining techniques with a peer-assisted learning strategy. The peer-assisted learning strategy was equally effective for students with writing difficulty or students with LD. Sentence-combining required peers to combine phrase into complicated constructions such as compound sentence or sentences with adjectives.

**Grammar/Usage**

In a small number of total studies, instruction in usage of capitalization and possessives proved beneficial to participants. Grammar instruction proved beneficial but less so than sentence combining instruction. In a direct comparison between instruction in sentence combining or grammar, sentence combining resulted in higher performance, lending support to recommendations that sentence combining may prove more beneficial to remediate sentence construction difficulties (Graham & Perin, 2007; Hillock, 1986).

**Transfer Of Intervention to Distal Outcomes**
Several studies that solely intervened on sentence level skills, particularly handwriting and sentence construction, found concurrent gains in sentence writing, compositional quality, and compositional length. This finding supports prior research that found relationships from handwriting to composition (Graham et al., 1997) and sentence combining to composition (Hillock, 1986). Both sentence combining studies however did not find a concurrent increase in the amount of taught instances of sentences to extended composition suggesting that increases in quality may not stem from inclusion of more complicated sentence types.

Limitations and Future Directions

The small number of studies and participant characteristics tempers results. The present review relied on each study to define characteristics of struggling writers and writers with LD. Studies can differ in demographic and functional descriptions of participants (Wolery & Ezell, 1993) limiting external validity of results. The present review also included only three grammar/usage studies. All three grammar/usage studies reported positive findings but the studies varied in scope of grammar skills, used different dependent variables, and produced mixed results in a direct comparison to sentence combining. Future research can continue to investigate multiple sentence level skills permitting a more robust review and synthesis of recommendations.

Future research can also investigate durations needed to impact handwriting. Handwriting remains an important and significant contributor to writing output but in a recent survey (Graham et al., 2008), 56% of primary grade teachers reported spending 10 minutes or less per day on handwriting. The vast majority of studies included for review spent at least twice as much time per day.
Researchers can also investigate the impact of computer use to compensate for difficulty with sentence level skills and to aid in composition of extended discourse, such as persuasive or expository essays. Keyboarding remains an important transcription skill (Berninger et al., 2002), along with spelling and handwriting, but research on keyboarding remains sparse (Berninger & Amtmann, 2003).

**Implications for Practice**

The section provides implications for practice for handwriting and sentence construction. Implications for each skill include research-based practices from reviewed studies, steps teachers can immediately take to begin implementation, and potential results.

**Handwriting.** This review found four specific results teachers of primary grade students with writing difficulties may want to consider: (a) model letter formation with visual cues and memory retrieval, (b) use alphabet or copy tasks to monitor student progress, (c) include orthographic coding activities that reinforce letter names and shapes, (d) intervening on motor processes in isolation from alphabetic letters may not improve handwriting performance.

Teachers can quickly assess student handwriting with an alphabet or copy task. During an alphabet task, students write as many letters of the alphabet from memory in 1-minute or less depending on student grade level with younger students possibly receiving fewer seconds. In a copy task students view words or sentences to copy within a predetermined amount of time. Teachers score either task for speed and legibility and determine letters their students have not yet acquired. Depending on instructional time available, teachers can set aside specific time for handwriting or efficiently teach
handwriting within reading and spelling lessons that introduce letter sounds and words. For example, when teaching pronunciation of the sounds /m/ or /a/ also require students to write and practice correct letter formation.

Following the above recommendations teacher can expect improved accuracy and speed of letter formation. Growth on alphabet or copy tasks will also depend on the amount of time available for handwriting instruction and characteristics of their individual students; students with orthopedic impairments may require additional interventions not addressed in this review. In addition to improved handwriting performance students may display concurrent gains in writing output of words and sentences.

**Sentence Construction.** Teachers of students with LD enrolled in later primary to early high school grades may consider six practices to improve sentence construction: (a) follow model-lead-test instructional formats, (b) assess writing by calculating proportion of complete sentences or CWS, (c) provide picture-word prompts to teach simple sentences, (d) use sentence combining for more complicated sentences, and (e) gradually increases sentence complexity from simple to more complicated constructions.

To determine if their students would benefit from intervention on sentence construction, teachers can collect a writing sample from their students. Students should respond to a written or picture prompts for several minutes to capture a sufficient sample of their sentence construction skills. Teachers can score the writing sample for the proportion of complete sentences or choose CWS that provides a global measure of capitalization, punctuation, and syntax. Using scores from the writing samples, teachers can schedule time specifically for sentence instruction or embed lessons within story or
essay writing tasks. For example, during a narrative story assignment, teachers can model writing sentences with adjectives within the story, lead students through guided practice, and test for independent performance within the students’ narrative story.

Following the above recommendations, teachers can expect an improved proportion of complete sentences and an increase in syntactically correct words. As a result of increased sentence construction, students may show concurrent gains in how readers judge their writing using a quality rubric (e.g., story cohesion, clear expression of ideas, etc).

**Conclusion**

Students with LD or writing difficulties display similar struggles with skills and strategies needed for writing and report less motivation to engage in writing tasks. Problems with written composition partly stem from a relationship between poorly developed sentence-level writing skills and its detrimental impact on more complex writing tasks. The need for effective interventions in sentence level writing skills remains a concern for the research community and practitioners who can benefit from identification of evidence-based practice.
References

References marked with an asterisk indicate articles included for review.


Table 1

Summary of Handwriting Studies

<table>
<thead>
<tr>
<th>Authors</th>
<th>Participants (N, Grade, Mean Age)</th>
<th>Study Design</th>
<th>Study Duration</th>
<th>Independent Variables</th>
<th>Results</th>
</tr>
</thead>
</table>
| Berninger et al. (1997)         | 114, 1st grade, 6 years old       | TC           | 24 sessions, 20 min each | a) motor imitation     
|                                 |                                   |              |               | b) visual cue     
|                                 |                                   |              |               | c) memory retrieval 
|                                 |                                   |              |               | d) visual cue + memory retrieval 
|                                 |                                   |              |               | e) copy 
|                                 |                                   |              |               | f) phonological awareness       
|                                 |                                   |              |               | (d) highest growth on alphabet task, ES = 1.71, and copy task, ES = 1.12 |
| Berninger et al. (2006), Study 1| 14, 1st grade, N/A                | TC           | 10 sessions, 30 min each | a) handwriting, orthographic, and motor 
|                                 |                                   |              |               | b) handwriting only |
|                                 |                                   |              |               | (b) superior in all speed measures, (a) better alphabet task accuracy |
| Berninger et al. (2006), Study 2| 20, 1st grade, 6 years old        | TC           | 10 sessions, 30 min each | a) handwriting, orthographic 
|                                 |                                   |              |               | b) handwriting, motor |
|                                 |                                   |              |               | (a) and (b) equally effective |
| Burns et al. (2009)             | 1, 2nd grade, N/A                 | SC           | 3 to 4 sessions per week, 8 weeks | a) cover-copy-compare 
<p>|                                 |                                   |              |               | b) baseline |
|                                 |                                   |              |               | Participant improved on two of three sets of letters: percentage of correctly formed letters changed in mean and accelerated in trend. |</p>
<table>
<thead>
<tr>
<th>Authors</th>
<th>Participants</th>
<th>Study Design</th>
<th>Study Duration</th>
<th>Independent Variables</th>
<th>Results</th>
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<tbody>
<tr>
<td>Graham et al. (2000)</td>
<td>38, 1&lt;sup&gt;st&lt;/sup&gt; grade, 6 years old</td>
<td>TC</td>
<td>27 sessions, 15 min each</td>
<td>a) handwriting, orthographic</td>
<td>(a) superior to (b) on alphabet task, ES = 1.17</td>
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<td></td>
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<td>b) phonological awareness</td>
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<td>Jones &amp; Christensen (1999)</td>
<td>38, 2&lt;sup&gt;nd&lt;/sup&gt; grade, 6 years old</td>
<td>TC</td>
<td>8 weeks, 10 min daily</td>
<td>a) handwriting, orthographic</td>
<td>(a) superior growth on alphabet task, ES = 2.09</td>
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<td>MacKay et al. (2010)</td>
<td>16, N/A, 6.8 years old</td>
<td>SG</td>
<td>8 sessions, 45 min each</td>
<td>a) Log handwriting program</td>
<td>(a) copy tasks improved in legibility, form, and size, ES = 1.59, but</td>
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<td>Sudsawad et al. (2002)</td>
<td>45, 1&lt;sup&gt;st&lt;/sup&gt; grade, 6 years old</td>
<td>TC</td>
<td>6 sessions, 30 min each</td>
<td>a) kinesthetic</td>
<td>no significant differences but (a) scored higher word legibility, ES =</td>
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<td>.13, and lower letter legibility, ES = -.11 than (b)</td>
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<td>Veena et al. (2002)</td>
<td>36, N/A, 7 to 9 years old</td>
<td>TC</td>
<td>12 sessions, 30-40 min each</td>
<td>a) handwriting only</td>
<td>(a) and (b) superior to (c), ES = 3.22</td>
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<td>b) handwriting, behavior intervention</td>
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<td>c) no treatment</td>
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<td>Zwicker &amp; Hadwin (2009)</td>
<td>72, 1&lt;sup&gt;st&lt;/sup&gt; to 2&lt;sup&gt;nd&lt;/sup&gt; grade, N/A</td>
<td>TC</td>
<td>10 sessions, 30 min each</td>
<td>a) cognitive</td>
<td>No significant differences but (a) ES = .50 and (b) ES = .39 scored higher</td>
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</table>

Note. TC = treatment comparison, SG = single group, SC = single case. ES = effect size.
Table 2

Summary of Sentence Construction Studies

<table>
<thead>
<tr>
<th>Authors</th>
<th>Participants (N, Grade, Mean Age)</th>
<th>Study Design</th>
<th>Study Duration</th>
<th>Independent Variables</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Anderson &amp; Keel (2002)</td>
<td>10 (5 LD, 5 EBD), 4th to 5th grade, N/A</td>
<td>SG</td>
<td>25 sessions, 35-50 min each</td>
<td>a) reasoning and writing</td>
<td>Majority improved from pre to post on the TOWL-2 syntactic maturity subtest. ES = .48</td>
</tr>
<tr>
<td>Bui et al. (2006)</td>
<td>113 (14 LD), 5th grade, N/A</td>
<td>TC</td>
<td>30 sessions, 45-60 min each</td>
<td>a) demand writing instruction model (DWIM) b) typical instruction</td>
<td>(a) grew significantly from pre to post on proportion of complete sentences, ES = 1.64, and complicated sentences, ES = 1.18</td>
</tr>
<tr>
<td>Dowis &amp; Schloss (1992)</td>
<td>4 LD, 6th grade, 12 years old</td>
<td>SC</td>
<td>5 to 8 sessions, 10 min each</td>
<td>a) possessives instruction b) complex sentence instruction c) no treatment</td>
<td>Three of four participants had changes in mean, level, and trend on percentage of correct complex sentences</td>
</tr>
<tr>
<td>McCurdy et al. (2008)</td>
<td>17 (15 LD, 2 MR), 9th grade, 14 years old</td>
<td>SC</td>
<td>Avg. 23 sessions, 10 min each</td>
<td>a) comprehensive writing program (CWP) b) no treatment</td>
<td>One out of three classrooms had immediate changes in level and trend in percentage of sentences; two other classrooms had positive but more modest increases; maintenance had high variability</td>
</tr>
<tr>
<td>Authors</td>
<td>Participants (N, Grade, Mean Age)</td>
<td>Study Design</td>
<td>Study Duration</td>
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<tr>
<td>Saddler, Asaro, &amp; Behforooz (2008)</td>
<td>4 LD, 4th grade, 9 to 10 years old</td>
<td>SC</td>
<td>18 sessions, 35 min each</td>
<td>a) sentence combining b) no treatment</td>
<td>Both dyads showed changes in level, mean, and had an accelerating trend</td>
</tr>
<tr>
<td>Saddler, Behforooz, Asaro (2008)</td>
<td>6 (3 LD), 4th grade, 9 to 10 years old</td>
<td>SC</td>
<td>Avg. 23 sessions, 10 min each</td>
<td>a) sentence combining b) no treatment</td>
<td>Two out of three dyads showed improved mean performance and/or immediate changes in level</td>
</tr>
<tr>
<td>Saddler &amp; Graham (2005)⁸</td>
<td>44, 4th grade, 9 years old</td>
<td>TC</td>
<td>30 sessions, 25 min each</td>
<td>a) sentence combining b) grammar instruction</td>
<td>(a) superior to (B) on TOWL-3 sentence combining subtest, ES -.83</td>
</tr>
<tr>
<td>Viel-Ruma et al. (2010)</td>
<td>6 LD (3 ELL), 9th to 11th grade, 14 to 17 years old</td>
<td>SC</td>
<td>26 sessions, 30-45 min each</td>
<td>a) expressive writing program b) no treatment</td>
<td>Two of six participants displayed immediate changes in level. All mean performances increased an average of 12 percentage points</td>
</tr>
<tr>
<td>Walker et al. (2005)</td>
<td>3 LD, N/A, 15 to 16 years old</td>
<td>SC</td>
<td>50 sessions, 50 min each</td>
<td>a) expressive writing program b) no treatment</td>
<td>All three participants increased in mean with gradual ascending trends</td>
</tr>
</tbody>
</table>

Note. ⁸Study also examined grammar/usage. TC = treatment comparison, SG = single group, SC = single case. ES = effect size.
Table 3

**Summary of Grammar/Usage Studies**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Participants (N, Grade, Mean Age)</th>
<th>Study Design</th>
<th>Study Duration</th>
<th>Independent Variables</th>
<th>Results</th>
</tr>
</thead>
</table>
| Campbell et al. (1991)   | 3 (2 LD, 1 MR), N/A, 9 years old  | SC           | 17 to 28 days, 15 to 20 min each | a) capitalization instruction  
b) no treatment             | One participant had high amounts of variability, but all participants improved in mean, level, and trend |
| Dowis & Schloss (1992) a | 4 LD, 6th grade, 12 years old     | SC           | 5 to 8 sessions, 10 min each    | a) possessives instruction  
b) complex sentence instruction  
c) no treatment | Three of four participants had changes in mean across phases. Two participants immediately increased level and mean, rising from 0 to 10 percent to 90 to 100 percent |
| Saddler & Graham (2005) a| 44, 4th grade, 9 years old        | TC           | 30 sessions, 25 min each        | a) sentence combining  
b) grammar instruction          | (a) superior to (b) on TOWL-3 sentence combining subtest, ES - .83      |

Note. a Study also examined sentence construction. TC = treatment comparison, SG = single group, SC = single case. ES = effect size.
Appendix D

Single-Case, Pilot Study of Sentence Combining

Improving Sentence Construction with Systematic Instruction and Frequency Building to a Performance Criterion of Sentence Combining

Many students struggle with expressive writing. In twelfth-grade, 5% of students with exceptionalities and 26% of typically developing students scored proficient or above on the writing subtest of the National Assessment of Educational Progress (U.S. Department of Education Institute of Education Sciences, National Center for Educational Statistics, 2009). Next to oral conversation, expressive writing provides a direct method for communication across academic, vocational, and social settings. Expressive writing allows students to demonstrate knowledge and refine understanding (Bangert-Drowns et al., 2004), and it serves as an important factor in promotion and salaried employment (National Commission on Writing, 2004). Expressive writing also enables participation in many online social activities, such as composing emails or posting messages to online social networks (Boyd, 2008).

Acquiring the skills to become a competent writer results from an interaction of skills and strategies and coordination between multiple processes (Berninger et al., 2002). Along with handwriting and spelling, the ability to construct sentences ranks as one of the most important beginning skills of expressive writing. Types of sentences range from simple to complex. Different types of sentences allow writers to express wants, describe situations, and produce permanent products of language.

Students with exceptionalities or writing difficulty struggle with many aspects of sentence construction (Graham, 2006). Their writing typically contains short, choppy, or
incomplete sentences with numerous mistakes in grammar, spelling, and punctuation (Kline, Schumaker & Deshler, 1991; Newcomer & Barenbaum, 1991). Also students with low-incidence exceptionalities, such as mild intellectual disabilities, typically acquire academic material at slower rates (Noonan & Siegel-Causey, 1990) and experience greater difficulty forming complete sentences (Marcell, Ridgeway, Sewell, & Whelan, 1995). Given the multiple problems with sentence construction and interaction between written expression skills, students with exceptionalities or writing difficulties stand to benefit from interventions that promote sentence construction and application towards more advanced writing skills.

**Composition and Behavioral Fluency**

Sentence construction researchers have primarily used a highly influential cognitive model of composition proposed by Hayes and Flower (1980) and later refined by Hayes (1996) to explain how automaticity in sentence construction benefits writers. The theory describes composition as an interplay between task environment, cognitive processes, long-term memory, and working memory. Task environment signals cognitive processes of planning or generating ideas, translating ideas into text, and revision of ideas and text until it clearly communicates the author’s intentions. Rapid deployment of ways to translate ideas into text, such as sentence combining, allows writers to use more resources in working memory on complex tasks.

An alternative theory proposes a different causal mechanism based on observable behavior. Behavioral fluency suggests component or element behaviors comprise and apply to composite or compound behaviors (Binder, 1996; Haughton, 1972, 1980; Johnson & Layng, 1992). The element behaviors, after reaching fluency defined by a
frequency over time, contribute to the successful formation of a compound behavior. Failure to build element behaviors to fluency results in inadequate or complete failure of compound performance.

The theory of behavioral fluency contains several assumptions. It assumes a strong correlation between element and compound behaviors. The theory also assumes fluent behaviors should retain across time and fluent element behaviors should apply to increases in closely related compound behaviors (e.g. identifying letter sounds applies to sounding out words). To test the assumptions of behavioral fluency, researchers have recommended measurement of behavior in frequency or count over time (Lindsley, 1991). As a unit of measurement, frequency allows researchers to quantify fluent performance, precisely measure retention of behaviors across time, and test for application of element behaviors to a compound behavior.

To achieve fluency in element behaviors, individuals engage in practice, or more precisely defined in the theory of behavioral fluency as frequency building to a performance criterion (FBPC). An example of a FBPC includes repeated reading. Repeated reading typically requires students to engage in timed reading with a goal of achieving higher frequencies of words read per minute (National Reading Panel, 2000). FBPC can result in fluent performance or behavioral fluency. Several studies have shown positive effects for FBPC on numeracy (Binder, Haughton, Van Eyk, 1990; Brady & Kubina, 2010; Lin & Kubina, 2005) and retention and application of literacy skills (Kubina, Young & Kilwein, 2004; Kubina et al., 2008; Therrien, 2004; Brown, Dunne, & Cooper, 1996). At the time of this writing all of the published studies on sentence
construction, however, have examined the effects of instruction to an accuracy criterion and the subsequent application of instruction, not behavioral fluency.

**Prior Sentence Construction Studies**

Several studies have found promising results for acquisition of sentence construction through systematic instruction based on sentence combining (Rogers & Graham, 2008). Sentence combining requires students to combine several simple sentences, called kernels, into one sentence with a connector (Strong, 1986). Connectors include adjectives, conjunctions, and dependent clauses. Students initially receive prompts called cues that provide appropriate connectors, such as *and* or *but*. Table 1 displays examples of cued and non-cued combinations.

In a seminal review of the writing literature, Hillock (1986) found positive effects for sentence combining with typically developing students. Sentence combining consistently led to increases in sentence complexity as measured by t-unit length (Hunt, 1965), and several studies reported accompanying increases in how teachers rated compositions for quality. Researchers, however, have mainly studied sentence combining with the writing of typically developing or elementary aged students with exceptionalities or writing difficulty. The research base for sentence combining would benefit from systemic replication and generalization of its effects. For example, no study has investigated effects of sentence combining on older adolescents with exceptionalities or writing difficulty.

For students with LD, a number of studies show promising outcomes for improving sentence construction. Three recent studies, for instance, examined effects of sentence combining with practice in dyads on fourth grade students with LD (Saddler,
Asaro, & Behforooz, 2008; Saddler, Behforooz, & Asaro, 2008) and fourth grade students struggling with writing (Saddler & Graham, 2005). In each study, participants used sentence combining to acquire compound sentences and sentences with adjectives. All three studies showed students improving from pre to post on the Test of Written Language – 3 (TOWL-3; Hammill & Larsen, 1996), increasing performance on sentence combining probes, and obtaining higher scores of writing quality. The studies contained different activities for promoting application of sentence combining to extended compositions. Application to extended compositions varied across studies and demonstrated only modest gains.

Because expressive writing plays such a critical role in the lives of students, the limited amount of research on successful interventions designed to teach sentence construction to older adolescents with exceptionalities or writing difficulty requires focused, and immediate, attention. Sentence combining studies has support as a method to improve sentence construction. Using FBPC also has evidence showing its implementation with academic skills results in fluent behavior. Therefore, the merging of sentence combining with FBPC may result in socially and academically significant outcomes. FBPC also allows further exploration into the causal mechanisms responsible for fluency in sentence construction.

To investigate the benefits of systematic instruction and FBPC of sentence-combining, the present study asked four experimental questions. First, would sentence construction of older adolescents with exceptionalities or writing difficulty improve following systematic instruction of sentence combining? Second, can older adolescents with exceptionalities or writing difficulty build frequency to a performance criterion for
sentence combining? Third, what effects would acquisition and FBPC have on retention? Fourth, would acquisition and FBPC alone, without explicit application instruction, promote application of sentence combining to extended composition?

**Method**

**Participants and Setting**

Four students, three males (Dan, Elmer, and Edward) and one female (Stacey), qualified for participation. Two participants received services for special education, Dan for mild intellectual disability and Elmer for a specific learning disability in reading. Teachers nominated the other two students, Stacey and Edward, as experiencing writing difficulty and as overage for grade level. Both Stacey and Edward received remedial writing instruction the previous school year. All participants qualified for free and reduced lunch and identified as African-American. During the previous school year, each participant received remedial reading decoding instruction from *SRA Corrective Decoding* (Engelmann, et al., 2008). Table 2 displays participant characteristics and scores on preassessment measures.

The participants attended an urban charter school in southern Louisiana. Intervention occurred during the summer between regular school sessions. Intervention sessions typically occurred inside of an unoccupied classroom. During each session, participants worked individually with the lead author and sat at adjacent desks. On several occasions, due to transportation difficulties, intervention took place at the participants’ homes. The lead author and participant would sit at a kitchen table or other free spaces within the home.

**Dependent Measure**
The frequency of correct and incorrect sentence combinations served as the dependent measure. Participants completed an assessment of the dependent measure at the end of each session. Each assessment lasted 3 minutes. Participants received no feedback on performance. Assessments featured experimenter created sentences and sentences from basal readers of fictional narratives. Using the Spache readability formula, sentences ranged from a second to third grade readability. Worksheets averaged 11 words per sentence combination and contained an even distribution between compound sentences and simple sentences with compound subjects or verbs.

A correct response contained two phrases combined into a compound or simple sentence with the conjunctions and or but and eliminated any redundant subject or predicates. Incorrect responses failed to include a compound or simple sentence or it contained redundancies. As an example, when prompted with two phrases, “Billy hopped on his bike / Billy rode to the store” a correct response combined both phrases into a simple sentence and eliminated the redundant subject of the second phrase, “Billy hopped on his bike and rode to the store.” An incorrect response would not have combined phrases into a single sentence or failed to eliminate the redundant subject like “Billy hopped on his bike and Billy rode to the store.” Skipped or incomplete items and instances of incorrect spelling, punctuation, or capitalization did not count as errors.

**Application Measure**

In addition to the dependent variable, the experimenters collected an application measure to assess the degree to which sentence combinations (i.e., element behavior) applied to extended compositions (i.e., compound behavior). Raters scored compositions for instances of taught sentence-combinations and mean words per t-unit (Hunt, 1965).
Participants completed an application measure following each experimental phase. After receiving a story starter, participants had a maximum of 10 minutes to compose a story. Participants received no prompts to use sentence combining or any other writing strategies and no feedback upon completion. The present study used writing prompts from commercially available curriculum-based measurement materials (Aimsweb, 2001). The experimenters randomized and counterbalanced all materials across participants.

**Interobserver Agreement**

Following completion of the study, the experimenters removed all identifying information from dependent and application measures. An individual naïve to the purpose of the study typed up extended compositions, correcting for spelling and capitalization errors. The lead author taught two raters naive to the purpose of the study calculation of the dependent variable, frequency of correct and incorrect sentence combinations per 3 minutes, and both application measures: mean words per t-unit length and taught sentence construction. After independently scoring examples, the lead author and raters compared scores. Instruction continued until scores differed by no more than one point on 10 consecutive scores.

One rater served as primary scorer of all measures, and the other rater randomly selected 33% of each measure and scored for interobserver agreement (IOA). Exact agreement (Johnston & Pennypacker, 2009), the number of agreements divided by the total number of intervals multiplied by 100, provided the amount of IOA. IOA of each measure went as follows: 90% on the primary dependent measure, 95% on mean words per T-unit, and 90% on the number of taught sentence combinations.

**Experimental Procedures**
Participant selection criteria. Participant selection followed four steps. First, teachers nominated students with writing difficulty or students receiving special education services with objectives for written expression in an Individualized Education Plan (IEP). Second, participants completed a sentence combining pretest that measured the speed and accuracy of combining sentence kernels into compound sentences. Scores had to fall below a performance criterion, 8 correct combinations with a maximum of 1 error, to qualify for participation. To determine a performance criterion, the principal of the school nominated 20 high-performing. The high-performing writers completed the timed sentence combining pretest. Scores falling at the 75th percentile served as the performance criterion.

Third, to control for handwriting speed as a possible confound, participants had to display average or above performance on a handwriting measure, writing approximately 60 correct letters per minute (clpm) on the alphabet task, compared to a previous large sample (Phelps, Stempel, & Speck, 1985). Fourth, to control for reading decoding speed as a possible confound, students had to display reading decoding performances above a second grade level.

Baseline. Prior to intervention, participants did not attend school daily because of summer break. Participants received no instruction in sentence writing, but received instruction in math and reading as part of a remedial summer program at the school. The remedial program met approximately three times a week for two and a half weeks.

Intervention. Intervention entailed sequential delivery of two independent variables: (1) systematic instruction leading to acquisition of sentence combining, and (2) frequency building to a performance criterion (FBPC). During instruction, participants
learned to combine sentences with conjunctions and or but. Participants received a total of three lessons on sentence combining to an accuracy criterion of 90%. Each instructional session lasted approximately 30 minutes.

Systematic instruction replicated sentence combining procedures from prior studies (Saddler, Asaro, & Behforooz; 2008; Saddler & Graham, 2005) except for two main differences. Prior studies used a peer assisted learning strategy and provided instruction on applying sentence combining to extended compositions. Participants in the present study worked individually with the instructor and did not receive instruction on extended composition. The lead author served as primary instructor and followed model-lead-test instructional formats (Archer & Hughes, 2010). For each new objective, the instructor modeled correct responses, lead participants through guided practice, delivered immediate error correction, and tested for independence.

During each FBPC session, participants completed two, 3 minute timed trials of sentence combining each session. Each FBPC session lasted approximately 10 minutes. Between timings the instructor provided performance feedback, error correction, and encouragement.

Individual Lesson Procedures

Instruction phase. At the beginning of lesson one, the instructor introduced sentence combining as a strategy to write more complex sentences that makes writing more interesting. The instructor defined compound sentences as two related simple sentences combined into one with a comma and conjunction. Participants read aloud two sentences, then vocally identified any similar subjects or predicates between the two sentences. If sentences contained similar subjects or predicates, then participants
transcribed a simple sentence. If sentences contained different subjects or predicates, then it formed a compound sentence. Table 1 provides examples of simple and compound combinations.

Instead of vocally identifying similar subjects or predicates, participants identified potential combinations as simple or compound sentences during lesson two. After vocally identifying the potential combination, participants transcribed their response. During lesson three, participants no longer vocally identified sentences prior to writing their response.

All three lessons had similar materials except for one difference. Lesson one and two had cues, an appropriate conjunction to combine sentences, but lesson three did not have cues. At the end of each lesson, participants completed an assessment. In order to proceed to the next lesson or experimental phase, participants had to achieve at least 90% accuracy.

**FBPC phase.** During the FBPC phase, participants completed two timed trials of sentence combining every session. Each timed trial lasted 3 minutes and required students to combine sentence kernels. The instructor reminded participants of the performance criterion, 8 correct combinations with a maximum of 1 error. Then the instructor started the timer and told the participants to begin. Following each timed trial, participants received feedback on the number of correct and incorrect responses. For incorrect responses, the instructor vocally modeled the correct response. The instructor praised students who met the criterion and encouraged students who did not meet it. The FBPC phase ended once students achieved the performance criterion on two out of three consecutive timings or after completing 20 timed trials.
Procedural Integrity

An audio device recorded all experimental sessions. An independent observer learned the intervention protocols. The independent observer and lead author practiced protocols until achieving at least 90% proficiency. The independent observer randomly selected 30% of the audio recordings across experimental phases and scored the instructor on an intervention protocol worksheet. Procedural integrity reached at least 90% across experimental phases.

Intervention Acceptability

To assess acceptability of intervention, participants completed a survey at the end of the study. The survey contained four likert scale questions and asked participants to rate each item from one, strongly disagree, to five, strongly agree. Participants responded to the following items, (a) learning to write simple and compound sentences is important, (b) the writing instruction and practice this summer helped me learn to write simple and compound sentences better, (c) I like how writing simple and compound sentences was taught, and (d) I will use what I learned in my classes. Participants also responded to an open ended question, “Is there anything you would change about the writing program?”

Experimental Design and Data Analysis

The present study used a multiple-baseline across participants design (Horner & Baer, 1978). The experimental design offered several advantages. To begin with, participants served as their own control to allow for intra-participant comparisons. Between participant comparisons would have proven difficult given the different exceptionalities across participants. Next, the staggered introduction of intervention
allowed for detection of a functional relation and the number of participants allowed for multiple opportunities to replicate effects.

The experimenters graphed the dependent measure on semi-logarithmic charts. Semilogarithmic charts have a multiply/divide y-axis and an add/subtract x-axis. These design qualities increase linearity and decrease variability between rulings, producing a conservative graphic display (Schmid, 1986). As an example, the distance between two rulings, either one to two or two to four, represents a mathematical doubling in performance. A semilogarithmic chart shows proportional distance. Moving from one to two has the same amount of space as going from two to four. Linear or arithmetically scaled charts would not maintain equivalent distance and require a third more distance when moving from two to four.

To analyze data points, the experimenters relied primarily on visual analysis. Kazdin (2011) recommended analyzing data for changes in magnitude and rate. Magnitude involves changes in mean and level across experimental phases. Mean refers to average performance during an experimental phase. Level specifies the immediate impact of intervention by comparing performance at the end of one phase to the beginning of the next phase. To analyze changes in rate, experimenters looked at trend. Trend refers to acceleration or deceleration of the slope. Lastly, variability (Pennypacker, Gutierrez, & Lindsley, 2003) looks at the fluctuation or stability of data points along the trend.

Results

Dependent Measure Outcomes
The results for the present study appear in tabular and graphic form. Table 1 displays descriptive statistics for the dependent measure. Figure 1 shows four, one cycle semilogarithmic charts with frequencies of correct and incorrect sentence combinations. Dots indicate the frequency of correct responses per 3 minutes, and X’s show incorrect responses per 3 minutes. All data points show performance across successive calendar days, except the first baseline data point of Dan. It occurred 3 weeks before his second data point due to an extended absence. Dates of retention differed because some participants left for summer vacation.

Across three baseline sessions, Dan consistently displayed stable responding, 0 corrects and 3 incorrects. During the acquisition phase Dan’s incorrects immediately decelerated in trend and level. The last two data points of the Instruction phase show a consistent two days of 0 incorrects. The correct responses rapidly accelerated, sharply rising in trend from 0 to 3. Following 3 days in Instruction, he proceeded to the FBPC phase. His performance ranged from 2 to 4 corrects and 0 to 1 errors with corrects rising in level and incorrects remaining at 0 incorrects. The data paths show stable trends with a large separation between corrects and incorrects indicating a high degree of accuracy. Dan did not reach the performance criterion during FBPC. The experimental phase ended following 20 timed trials that occurred across 10 sessions. Dan completed a retention measure 11 days following FBPC and had 3 corrects and 0 incorrects. The retention data reveal no decrease in performance compared to the last data point in FBPC, the corrects remained within the range of data in the FBPC phase while the incorrects continued at zero.
Elmer displayed a higher frequency of incorrects than corrects on three of five baseline sessions. Elmer’s corrects decreased and his incorrects increased, with his pattern of responding showing a worsening condition as he moved into the Instruction phase. Elmer showed an immediate decrease in level of errors, dropping from 5 to 2 errors, with a rapidly decelerating trend during Instruction. The correct responses rose in level and had a rapidly accelerating trend. In the FBPC phase, Elmer’s correct sentence combinations showed more variability with a rise in level and a moderately accelerating trend. Both data paths for corrects and incorrects show stability with the last four data points, respectively, consistently accelerating and decelerating. On the last day of FBPC, Elmer reached the performance criteria of 8 correct sentence combinations with a maximum of 1 incorrect on two of three consecutive timings. Overall he completed 14 timed trials across 7 FBPC sessions. Retention occurred after 11 calendar days, and Elmer had 6 correct and 1 incorrect sentence combinations. Compared to the last data point in FBPC, retention lessened slightly by 2 corrects from 8 to 6. Elmer’s incorrect sentence combinations retained at the same performance of 1 incorrect per 3 minutes.

In baseline, Stacey showed a variable, accelerating trend in incorrects, rising from 1 to 3 errors. Stacey’s correct sentence combinations had a moderately decelerated trend dropping from 3 to 1. Like Elmer, Stacey had a worsening baseline with incorrect responding accelerating and correct responding decelerating. During the Instruction phase, the trends in data paths reversed. Sentence combinations accelerated from 2 to 4 corrects while incorrects decelerated from 2 to 0. During FBPC, corrects moderately and consistently accelerated, ranging from 4 to 8 sentence combinations. Stacey’s incorrects continued to rapidly decelerate with stable downward trend ranging from 3 to 0. Stacey
exited the FBPC phase when she reached the performance criteria following 18 timed trials or 9 FBPC sessions. A retention interval of 26 days from completion of FBPC showed a performance of 4 corrects and 1 error. Retention data indicate a slight decrease from the last data point in FBPC of 6 corrects and 1 error and fell within the range correct and incorrect responding demonstrated in the FBPC phase.

Edward showed a high degree of variability in performance during baseline with overlap between corrects and incorrects on four of six sessions. Upon introduction of the Instruction phase the incorrects immediately dropped in level and remained at a consistent, stable trend of 0 for all data points. Correct sentence combinations rose in level and demonstrated a slight decelerating trend. During the FBPC phase Edward’s corrects again rose in level and showed a moderately accelerating trend, ranging from 4 to 6. Edward’s incorrects followed the same path as the previous phase aside for one data point where he had 1 incorrect sentence combination; all the other 9 data points remained at 0. The FBPC phase ended for Edward when he did not reach the performance criteria but instead had 20 timed trials or 10 FBPC sessions. The retention data showed a slight reduction 31 days following completion of FBPC, with a performance of 4 corrects and 1 error compared to his last data point of 5 correct and 0 incorrect.

**Application Measure Outcomes**

Table 4 displays descriptive statistics for application measure outcomes. Mean words per t-unit and the number of taught constructions in extended composition varied across participants. Of the four participants only Stacey showed a gradual acceleration in mean words per t-unit across experimental phases, improving from 7.6 to 8.5. Compared
to baseline, Dan and Edward showed an increase during acquisition but no improvement following FBPC. Elmer showed a decline from baseline but improved following FBPC.

No participant showed a consistent acceleration in instances of taught combinations across experimental phases. Elmer had his highest performance, 4 instances of taught combinations, during baseline but displayed zero instances following acquisition or FBPC. Dan, Stacey, and Edward displayed their highest scores following baseline, but scores fluctuated across acquisition and FBPC. Dan and Stacey improved from baseline performance following completion of both acquisition and FBPC. Edward showed improvement from baseline but his scores fluctuated and decreased following FBPC.

**Intervention Acceptability**

On a scale of 1, strongly disagree, to 5, strongly agree, participants responded with an average score of 5 as to whether simple and compound sentences was an important skill. Similarly participants strongly agreed, with an average of 5, that the intervention helped them learn sentence writing and they would use the skill in other classes. Stacey reported that she began to use sentence combining techniques when writing in a daily journal. The participants also rated the intervention as favorable with an average score of 4. Elmer indicated he looked forward to each session. As evidence, during his summer vacation, the time of the study, he rode a city bus for more than an hour each morning to participate. No participant suggested any changes to the writing program.

**Discussion**
The theory of behavioral fluency proposes that high frequency element responses coalesce and form, or apply to, a compound behavior (Binder, 1996, 2005; Haughton, 1972, 1980; Kubina, Young & Kilwein, 2004). The theory also suggests that fluent element behaviors will retain across time and show little to no performance decrement (Binder, 1996, 2005; Kubina et al, 2008). The present study examined the effects of combining systematic instruction with behavioral fluency on sentence construction for older adolescents struggling with sentence construction.

The first question this study asked, would sentence construction of adolescents with exceptionalities or writing difficulty improve following systematic instruction of sentence combining? The results show instruction increased the performance of the older adolescents with writing difficulty or exceptionalities (i.e., LD and mild intellectual disabilities) to construct simple and compound sentences. Compared to baseline, all mean correct responses increased and mean incorrects decreased. Participants showed a decrease in errors and clear separation in data paths between corrects and incorrects indicating a rapid gain in accuracy. The results from the instruction phase extends prior sentence combining studies that included younger, typically developing students or those receiving special education services for LD (Saddler, Asaro, & Behforooz, 2008; Saddler, Behforooz, & Asaro, 2008; Saddler & Graham, 2005). The results show instructional procedures found in the sentence combining literature for younger students with disabilities function similarly for older adolescents with writing difficulty or exceptionalities.

The second experimental question focused on FBPC and investigated if it would lead to additional gains in performance. As the first study to apply FBPC to sentence
combining, the results demonstrate all participants obtained substantial gains during the FBPC phase. Participants attained the highest levels of corrects and lowest levels of incorrects with FBPC. Additionally, stability of writing performance also increased with a clear separation between data paths for corrects and incorrects. The majority of participants displayed some overlap between corrects and incorrects in baseline and acquisition but no overlap occurred in FBPC. The effects of engaging in consistent practice combining sentences at a high level for an extended period of time benefited all participants. Therefore, achieving an accuracy criterion alone may represent only the first step in a comprehensive intervention program geared towards fostering consistent sentence combining performance.

During FBPC the amount of practice sessions varied across participants. The phase ended upon achievement of the performance criterion or after 20 timed trials, whichever occurred first. Both participants who achieved the criterion, Elmer and Stacey, took fewer practice trials to reach the criterion than Dan and Edward who did not meet the criterion. Elmer and Stacey, despite needing fewer practice opportunities, achieved the highest scores on assessment. This finding suggests writers struggling with sentence construction may benefit from practice at a high frequency criterion rather than more practice at a lower frequency level. Stated differently, high quality practice detected by time practice trials (i.e., the frequency unit of measurement) yielded superior results to a lower quality practice even though such practice occurred at a higher overall amount.

Another significant facet of the FBPC phase lies in its economy of time. The total time spent on frequency building follows: Elmer, 42 minutes across 7 calendar days;
Stacey 53 minutes across 9 calendar days; Dan and Edward, 60 minutes across 10 calendar days. The previously described totals distributed across a relatively short time period lead to meaningful gains. Furthermore, the time needed to build frequency each day could fit into a writing lesson or occur at another time convenient for the teacher.

A third experimental question asked if acquisition and FBPC would result in no to minimal decreases in retention. The results show that all participants retained sentence-combining skills with high accuracy. One participant, Dan, showed no decrease in frequency from FBPC. The remaining participants showed only minimal decreases in frequency during retention. Both participants who reached the performance criterion displayed the highest number of correct combinations. The retention data supports previous research findings in behavioral fluency showing that building frequency to a high performance criterion results in high degree of retention (e.g., Bucklin, Dickinson, & Brethower, 2000; Hughes, Beverly, & Whitehead, 2007; Ivarie, 1986; Kubina et al, 2008; Olander, Collins, McArthur, Watts, & McDade, 1986). All participants attained high frequencies in FBPC and even the two who did not reach the terminal performance criterion showed minimal declines in their performance. Practicing to a high frequency appears to result in greater retention for sentence combining.

The fourth experimental question examined whether acquisition and FBPC would promote application of combined sentences to an extended composition. Following one or both of the experimental phases, the majority of the participants showed slight increases in mean words per t-unit or number of taught sentence combinations. The findings suggest both experimental phases resulted in modest application of sentence combinations to extended composition, similar to prior sentence combining studies that
provided explicit activities to promote application (Saddler & Graham, 2005; Saddler, Behforooz, & Asaro, 2008). However, comparison to other studies remains difficult. Unlike prior sentence combining studies that provided explicit activities to promote application, participants in this study received no instruction on application. Also, the present study reported application of only compound sentences, but previous studies combined adjectives and compound sentences into a single application measure.

Overall findings from this study suggest that engaging in frequency building to a performance criteria can serve as an effective supplement to systematic instruction of sentence combining. As predicted by the theory of behavioral fluency, engaging in deliberate and thoughtful practice of an element behavior to a performance criterion lead to gains in performance and resulted in positive retention measures. Both participants who practiced at a higher frequency level or performance criterion outperformed participants that received more practice opportunities at a lower frequency level. Engaging in practice at lower frequency levels, however, may still lead to smaller gains in performance and favorable retention. Modest application results across participants suggest tentative support of applying high frequency element behaviors to more complex, compound behaviors such as extended compositions.

**Limitations**

The study included two limitations. Two participants, Edward and Dan, did not reach the performance criterion of eight correct combinations before the end of the study. Both participants displayed handwriting difficulties that made further gains on sentence combining unlikely. Timed trial materials required at least 100 correct letters per minute (clpm), far above the threshold set for inclusion of 62 clpm. A second limitation includes
uneven retention data. Due to limited availability during summer session, experimenters collected one retention measure from each participant and the retention intervals varied. A more uniform retention measure (e.g., one month for all students) would permit a fuller discussion and allow examination of variability.

**Future Research**

Future research should begin with a replication of the present findings with a range of different students (e.g., low-incidence exceptionalities, such as mild-mental retardation, older students with LD, students with Other Health Impairments like attention deficit disorder). Researchers might also investigate more effective methods to increase application of sentence combining to extended composition, such as investigating related components skills needed such as handwriting and spelling. Future research studies would also benefit from further investigation of FBPC, specifically examining the performance criterion and determining its effect on a larger sample.
References


Table 1

*Examples of cued and non-cued combinations to form compound sentences or simple sentences with compound subjects or verbs*

<table>
<thead>
<tr>
<th>Kernel Sentences</th>
<th>Examples of correct combination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cued</strong></td>
<td></td>
</tr>
<tr>
<td>We had a brand new car. The engine started smoking. (but)</td>
<td>We had a brand new car, but the engine started smoking.</td>
</tr>
<tr>
<td>Tom ate a sandwich. Tom ate some chips. (and)</td>
<td>Tom ate a sandwich and some chips.</td>
</tr>
<tr>
<td><strong>Non-cued</strong></td>
<td></td>
</tr>
<tr>
<td>Tom bought a hat. Susan bought a baseball.</td>
<td>Tom bought a hat, and Susan bought a baseball.</td>
</tr>
<tr>
<td>The mailman walked past the dog. My neighbor walked past the dog.</td>
<td>The mailman and my neighbor walked past the dog.</td>
</tr>
</tbody>
</table>
Table 2

Participant characteristics and preassessment data

<table>
<thead>
<tr>
<th>Student</th>
<th>Age</th>
<th>Grade Level</th>
<th>Gender</th>
<th>Race</th>
<th>Exceptionality</th>
<th>Reading</th>
<th>Handwriting (clpm)</th>
<th>Sentence Combining (correct/incorrect)</th>
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<tbody>
<tr>
<td>Elmer</td>
<td>14-7</td>
<td>7</td>
<td>M</td>
<td>AA</td>
<td>LD</td>
<td>SRA C</td>
<td>107</td>
<td>3/3</td>
</tr>
<tr>
<td>Dan</td>
<td>13-10</td>
<td>7</td>
<td>M</td>
<td>AA</td>
<td>ID</td>
<td>SRA B2</td>
<td>69</td>
<td>0/1</td>
</tr>
<tr>
<td>Stacey</td>
<td>13-11</td>
<td>7</td>
<td>F</td>
<td>AA</td>
<td>None</td>
<td>SRA C</td>
<td>80</td>
<td>2/2</td>
</tr>
<tr>
<td>Edward</td>
<td>16-1</td>
<td>8</td>
<td>M</td>
<td>AA</td>
<td>None</td>
<td>SRA B2</td>
<td>67</td>
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</table>
Table 3

*Primary Dependent Measure Outcomes Over Time: Means and Standard Deviations*

<table>
<thead>
<tr>
<th>Student</th>
<th>Phase</th>
<th>Corrects M(SD)</th>
<th>Incorrects M(SD)</th>
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<tbody>
<tr>
<td>Elmer</td>
<td>Baseline</td>
<td>1.8 (.84)</td>
<td>4.4 (1.1)</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>3.7 (.58)</td>
<td>1 (1)</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>5.1 (1.5)</td>
<td>1.1 (.9)</td>
</tr>
<tr>
<td></td>
<td>Retention</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Dan</td>
<td>Baseline</td>
<td>0 (0)</td>
<td>3 (0)</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>1.7 (1.5)</td>
<td>.3 (.58)</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>3.7 (.82)</td>
<td>.4 (.7)</td>
</tr>
<tr>
<td></td>
<td>Retention</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Stacey</td>
<td>Baseline</td>
<td>2.5 (1)</td>
<td>2.17 (.98)</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>3 (1)</td>
<td>1.7 (1.5)</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>5.3 (1.5)</td>
<td>.78 (.67)</td>
</tr>
<tr>
<td></td>
<td>Retention</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Edward</td>
<td>Baseline</td>
<td>2.1 (.86)</td>
<td>1.7 (.76)</td>
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<tr>
<td></td>
<td>Instruction</td>
<td>2.3 (.58)</td>
<td>0.3 (.58)</td>
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<td>0.1 (.32)</td>
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Table 4

Extended Composition Measures Over Time: Mean Words per T-Unit and Instances of Taught Combinations

<table>
<thead>
<tr>
<th>Student</th>
<th>Phase</th>
<th>Mean Words Per T-Unit</th>
<th>Instances of Taught Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elmer</td>
<td>Baseline</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>9.3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>9.5</td>
<td>0</td>
</tr>
<tr>
<td>Dan</td>
<td>Baseline</td>
<td>12.5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>20.5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>8.6</td>
<td>1</td>
</tr>
<tr>
<td>Stacey</td>
<td>Baseline</td>
<td>7.6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>8.5</td>
<td>4</td>
</tr>
<tr>
<td>Edward</td>
<td>Baseline</td>
<td>7.8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>9.7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>FBPC</td>
<td>9.2</td>
<td>1</td>
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</tbody>
</table>
Figure 1. Semi-logarithmic charts of correct and incorrect sentence combinations per three minutes.
LESSON 1

Objective 1: See picture with persons named. See text that has tell more, fill in names something

Model (only teacher writes)

1. Put your pens or pencils down and don’t pick them up until I say.

2. You’re going to write simple sentences that report on a picture. When you write simple sentences, first you name something, then you tell more about the thing you name.

3. So first, you name something, then you tell more. What do you do first? “Name something.” Then what do you do? “Tell more.”

(repeat until firm).

4. Find part A on your worksheet. The instructions say fill in the missing part of each sentence. The part that tells more is written under the picture, but the part that names is missing.

5. Sentence 1 says: _______ ran into the room. What names goes in that blank? “An alligator.”


7. A simple sentence starts with a Capital letter and ends with a period, so I need to check that I have that as well.

(repeat for sentences 1-3).

High Prompt: Repeat above steps with the next picture but now teacher & student write on their sheet.

Medium Prompt: Repeat above steps with the next picture but only student writes on their sheet

Low Prompt: Students complete the next picture independently, and teacher reviews answers.

Objective 2: See picture with persons named. See text that has names something, fill in tell more from box

Model (only teacher writes)
1. Find part B on your worksheet. The instructions say fill in the missing part of each sentence. This time the part that names is written below the picture. You must fill in the correct part that tells more.

2. You’re going to write simple sentences that report on a picture. When you write simple sentences, first you name something, then you tell more about the thing you name.

3. So first, you name something, then you tell more. What do you do first? “Name something.” Then what do you do? “Tell more.”

4. You have to write the part that tells more. The parts that tell more are written in a box next to the picture. Touch the box. I’ll read the parts to you.

(Teacher reads parts).

5. Let’s look at number 1 under the picture. Who will that sentence name? “Mrs. Brown.”

6. Find the part in the box that tells more about Mrs. Brown. Say the words that tell more about Mrs Brown. “Stirred the food in the pot.”

7. Say the whole sentence. “Mrs. Brown stirred the food in the pot.” Write stirred the food in the pot.

8. A simple sentence starts with a Capital letter and ends with a period, so I need to check that I have that as well.

(repeat for sentences 1-3).

High Prompt: Repeat above steps with the next picture but now teacher & student write on their sheet.

Medium Prompt: Repeat above steps with the next picture but only student writes on their sheet

Low Prompt: Students complete the next picture independently, and teacher reviews answers.

---------------------------------------------------------------

Objective 3: See sentences, say which part names something, which part tells more

Model (only teacher writes)

1. Find part C on your worksheet. The instructions say underline the part that names.
Now we have no picture, just sentences. Read sentence 1 for me. “**Kim jumped high into the air.**”

2. What part names something? “**Kim.**”

3. Underline the part that names.

4. Tell me more about Kim. “**jumped high into the air.**”

(repeat above steps for sentence 2-5)

**High Prompt:** Repeat above steps with 6-10 but now teacher & student write on their sheet.

**Medium Prompt:** Repeat above steps with 11-15 but only student writes on their sheet

**Low Prompt:** Students complete 16-20 independently, and teacher reviews answers.

-----------------------------------------------------------------------------------------

CHECKOUT FOR LESSON 1

I want to see how well I taught you today’s lesson. You will complete this worksheet by yourself.

(To proceed to Lesson 2 tomorrow, student needs to score at least 90% on the checkout. If they score below, repeat Lesson 1 the next day).

-----------------------------------------------------------------------------------------
Lesson 1

Objective 1: SWBAT match the names of someone/something to the part that tells more.

Instructions: Fill in the missing part of each sentence.

1. ___________________ ran into the room
2. ___________________ stood behind his desk
3. ___________________ made marks on a piece of paper
4. ___________________ watched the alligator from the front row

5. ___________________ sat on his dad’s lap.
6. ___________________ put his arm around Billy.
7. _____________________ stood on top of a horse.
8. _____________________ sat in a wagon.

9. _____________________ put her coat over her head.
10. _____________________ had an umbrella.
11. _____________________ held a newspaper over his head.
12. _____________________ sat on the sidewalk near the woman.

13. _____________________ laid on a towel.
14. _______________ carried a surfboard.

15. _______________ built a sand castle.

---

**Objective 2: SWBAT match the part that tells more to persons name.**

**Instructions:** Fill in the missing part of each sentence.

<table>
<thead>
<tr>
<th>Mrs. Brown</th>
<th>David</th>
<th>Alex</th>
</tr>
</thead>
<tbody>
<tr>
<td>carried two small logs.</td>
<td>petted the dog.</td>
<td>stirred the food in the pot.</td>
</tr>
</tbody>
</table>

4. Mrs. Lee _______________

The cat talked on the phone.  
reached for the cage.  
grabbed the dog's tail.
5. Bobby _________________________________________________________

6. The cat __________________________________________________________

7. Ted ____________________________________________________________

8. His sister _________________________________________________________

9. A man __________________________________________________________

10. Phil ____________________________________________________________

11. His mother _____________________________________________________

12. His father _______________________________________________________

“dropped his ice cream cone. played the guitar. held her ice cream cone.”

“pulled a shirt from the dog. washed clothes in a tub. hung clothes on a line.”
Objective 3: SWBAT identify which part names someone/something and which part tells more.

Instructions: Underline the part of each sentence that names something.

1. Kim jumped high into the air.
2. The old man read the newspaper.
3. The small dog chased the cars.
4. It rolled down the hill.
5. A ball broke the window.
6. Tim wore a jacket.
7. Mr. Smith caught a large fish.
8. Robert wrote on a notepad.
9. The bicycle looked brand new.
10. The doctor listened to his heart beat.
11. The wind blew everything away.
12. A dog bit the mailman at our house.
13. The old man painted a picture.
14. Steve gave his dog a bath.
15. The cook put soup on the stove.
16. We ran to the store.
17. The cook yelled from the kitchen.
18. The old woman fell down.

19. The cup fell off the counter.

20. The car would not start.
Lesson 1 Checkout

Instructions: Fill in the missing part in each sentence.

1. _______ swept the floor.
2. _______ washed the windows.
3. _______ scrubbed the wall.

4. The boss ______________________________

5. A carpenter __________________________

6. Their helper __________________________

carried wood. hammered nails. used a saw.
LESSON 2

Objective 4: See sentences, say which part names something, which part tells more

High Prompt (student & teacher both write):

1. Yesterday we worked on two parts of a simple sentence. First a simple sentence names something, then it tells more. What does it do first? “Names something.” Then what? “Tells more.”

2. Find part A on your worksheet. The instructions say underline the part that names. Now we have no picture, just sentences.

3. Read sentence 1 for me. “The animals were in the circus.”


5. Tell me more about the animals. “Were in the circus.”

(repeat with sentences 2-5).

Medium Prompt: Repeat above steps with 6-10 but only student writes on their sheet

Low Prompt: Students complete 11-20 independently, and teacher reviews answers.

-----------------------------------------------------------------------------------

Objective 5: See examples of simple sentences and non examples of sentence fragments (part that names or tells more), and say if it is a simple sentence if not, what part is missing. Circle the simple sentence.

Model (only teacher writes)

1. All simple sentences need two parts: one that names something, then tells more. Find part B on your worksheet. The instructions say circle each simple sentence.

2. Read problem 1 for me. “The dog.”

3. Is that a simple sentence? “No.”

4. Good don’t circle it. It is not a simple sentence. What part is there? The part that names or part that tells more? “The part that names.”

(If yes, circle it).
(If no, ask student what part is there).
(repeat for sentences 1-3).

**High Prompt**: Repeat above steps with 6-10 but now teacher & student write on their sheet.

**Medium Prompt**: Repeat above steps with 11-15 but only student writes on their sheet

**Low Prompt**: Students complete 16-20 independently, and teacher reviews answers.

---

**Objective 6**: The person who wrote these sentences does not realize all sentences start with a capital letter and have an end mark.

**Model (only teacher writes)**

1. All sentences start with a capital letter and an end mark. Find part C on your worksheet. The instructions say: put in the capitals and periods.

2. Let’s read sentence 1. “**The boy ran into the street**.”

3. Is it missing a capital or end mark, yes or no? **Yes**. Fix it up.

(If no, then go to the next sentence).

**High Prompt**: Repeat above steps with 6-10 but now teacher & student write on their sheet.

**Medium Prompt**: Repeat above steps with 11-15 but only student writes on their sheet

**Low Prompt**: Students complete 16-20 independently, and teacher reviews answers.

---

**CHECKOUT FOR LESSON 2**

I want to see how well I taught you today’s lesson. You will complete this worksheet by yourself.

(To proceed to Lesson 2 tomorrow, student needs to score at least 90% on the checkout. If they score below, repeat Lesson 1 the next day).
LESSON 2

Objective 4: SWBAT identify which part names someone/something and which part tells more.

Instructions: Underline the part of each sentence that names something.

1. The animals were in the circus.
2. The girl drew a picture.
3. Our new teacher helped us.
4. He marched in the band.
5. The class played basketball.
6. The men told jokes.
7. They washed the car yesterday.
8. Her father did not like meat loaf.
9. The truck had a flat tire.
10. The women wore red shirts.
11. A women went to the zoo.
12. Kevin delivered newspapers.
13. A big grey dog howled at the moon.
14. The truck crashed into the wall.
15. The red bird had a twig in its mouth.
17. The peanut butter tasted weird.
18. Ms. Davis gave our tests back.
19. The newspaper landed in the sprinkler.
20. Bobby drove the car away.
Objective 5: SWBAT discriminate between incomplete and complete simple sentences.

Instructions: Circle each simple sentence.

1. The dog
2. Sat in the tree.
3. The boy sat in the tree.
4. The old man
5. We swung in the trees.
6. My shirt
7. My shirt smelled funny.
8. Played basketball.
9. The girls sat in chairs.
10. Looked at the T.V.
11. The king counted coins.
12. The big yellow bird.
13. Her daughter
14. Her daughter put a hot dog on the grill.
15. Stood up.
16. Our computer.
17. We ran home.
18. Grabbed the candle.
19. Hot day.
20. The swimmer dove in the pool.
Objective 6: SWBAT identify correct and incorrect beginning capitalization and end mark.

Instructions: Put in the capitals and periods.

1. the boy ran into the street.
2. The boy ran into the street
3. Our new dog smelled weird.
4. The sneakers smelled new
5. we held a candle
6. The family carried the sofa.
7. the dogs pulled the sled.
8. sam looked at his new car
9. The sun shined in the sky.
10. an apple fell from the tree
11. Officer Bob ate pancakes
12. she stood on the chair
13. his mother heard the cat.
14. She picked up the pencils.
15. The hamburgers smelled burnt.
16. we ran the race.
17. My book bag had a big hole.
18. Mr. Sanders won the dance contest.
19. gary drove the truck
20. Tom read the newspaper
Lesson 2 Checkout

Instructions: Underline the part of each sentence that names something.

1. The old dog jumped over the fence.
2. We ran across the street.
3. Tim played the drums in our band.
4. My left shoe had gum on it.
5. Peter looked at the tree.

Instructions: Circle each simple sentence.

6. The yellow cat.
7. The yellow cat sat in the tree.
8. Peter.
9. Swung the bat.
10. The newspaper was very wet.
**Objective 7:** See examples of simple sentences and non examples of sentence fragments (part that names or tells more), and say if it is a simple sentence if not, what part is missing. Circle the simple sentence.

**Lesson 3**

**High Prompt (teacher & student write)**

1. All simple sentences need two parts: one that names something, then tells more. Find part A on your worksheet. The instructions say circle each simple sentence.

2. Read problem 1 for me. “The hot dog.”

3. Is that a simple sentence? “No.”

4. Good don’t circle it. It is not a simple sentence. What part is there? The part that names or part that tells more? “The part that names.”

   (If yes, circle it).

   (If no, ask student what part is there).

   (repeat for sentences 1-5).

**Medium Prompt:** Repeat above steps with 6-10 but only student writes on their sheet

**Low Prompt:** Students complete 11-20 independently, and teacher reviews answers.

---

**Objective 8:** See a picture and two words that describe it, write a sentence.

**Model:** (only teacher writes)

1. Each picture has two words. One word tells the part that names. The second word helps you tell more. But you need to finish the rest of the sentence.

2. The instruction say write a complete sentence for each picture using both words.

3. A simple sentence has a part that names, and a part that tells more. I use this word as the part that names (point to the word). Now I need to tell more using this word (point to second word).

   (teacher writes a sentence using both words)

I can’t forget my capital and end mark.
(repeat above steps for 1-3)

**High Prompt:** Repeat above steps with 4-6 but now teacher & student write on their sheet.

**Medium Prompt:** Repeat above steps with 7-10 but only student writes on their sheet

**Low Prompt:** Students complete 11-20 independently, and teacher reviews answers.

---------------------------------------------

**CHECKOUT FOR LESSON 3**

I want to see how well I taught you today’s lesson. You will complete this worksheet by yourself.

(To proceed to Lesson 2 tomorrow, student needs to score at least 90% on the checkout. If they score below, repeat Lesson 1 the next day).

---------------------------------------------
LESSON 3

Objective 7: SWBAT discriminate between incomplete and complete simple sentences.

Instructions: Circle each simple sentence.

1. The hot dog.
2. The shoe store.
3. The plane crashed in the sea.
4. Ran to the store.
5. We babysat my sister.

6. Two rocks.
7. He sat on the bench.
8. Painted the wall.
9. Tied his shoe laces.
10. Liked music.

11. She liked to listen to music.
12. The water.
13. The T.V.
14. The store closed early.
15. My shoes hurt my feet.

17. My father watched T.V.
18. Watched T.V.
19. Carol cut my hair.
20. The runners started the race.
Directions: Write a complete sentence for each picture using both words.

**Objective 8 Part A**

1) **rode**

2) **jumped**

3) **ball**

4) **stage**

5) **pool**
ben

bed

a large shark

ate

my brother

ocean

our cat

sat

the worker

planted
11) the owl branch

12) a scared cat climbed

13) an old witch rode

14) the racer hurdle

15) betty fire
16) my dad  

17) tom  

18) joanne  

19) my little brother  

20) sam  

grass

bag

jumped

bed

scale
Directions: Write a complete sentence for each picture using both words.

1) 
   **scared**

2) 
   **watched**

3) 
   **slept**

4) 
   **egg**

5) 
   **fell**
6) zack   spaghetti

7) our aunt   basket

8) the baby   bear

9) darian   water

10) the nurse   gave
Directions: Write a complete sentence for each picture using both words.

1) the waitress carried

2) my aunt diaper

3) roger van

4) susan dried

5) melinda cake
6) rachel slept

7) laura sticks

8) ms. fields got

9) petra watch

10) vince sandbox
Directions: Write a complete sentence for each picture using both words.

1) **Wanda**
   - stove

2) **The little girl**
   - stood

3) **Dan**
   - fish

4) **The bird**
   - sang

5) **Jill**
   - ate
6) Brandon shoveled

7) Nick finger

8) The cowboy gun

9) The cat food

10) The bear stood
Directions: Write a complete sentence for each picture using both words.

1) **eric**
   box

2) **the old man**
   had

3) **ben**
   scooter

4) **denny**
   signed

5) **kyle**
   had
6) bill

butterfly

7) fred

listened

8) janice

horse

9) jane

monkey bars

10) the captain

fish
Directions: Write a complete sentence for each picture using both words.

1) kendall

logs

2) ryan

walked

3) samuel

fire

4) betty

lights

5) grandma

eggs
6) **edgar**  
   broken arm

7) **mr. young**  
   turkey

8) **the baby**  
   crib

9) **tom**  
   tree swing

10) **derrick**  
    candy
Directions: Write a complete sentence for each picture using both words.

1) the prisoner was
   ______________________________________
   ______________________________________

2) jake carried
   ______________________________________
   ______________________________________

3) ms. parker fruit
   ______________________________________
   ______________________________________

4) danny briefcase
   ______________________________________
   ______________________________________

5) the barber swept
   ______________________________________
   ______________________________________
6) cheryl watched

7) eric papers

8) sandy bongos

9) mike muscles

10) carol elephant
Directions: Write a complete sentence for each picture using both words.

1) sue
   umbrella

2) denny
   push-ups

3) valerie
   trash

4) jerry
   climbed

5) anne
   sat
6)  ted

7)  the chef

8)  montrell

9)  lilly

10) mr. nye

smacked

knife

chased

styled

rain
Directions: Write a complete sentence for each picture using both words.

1) the tailor
   tape measure

2) grandma
   jet ski

3) mick
   blew

4) steven
   chopsticks

5) tilly
   mouth
6) donald
   cut

7) he
   ladder

8) the man
   chicken

9) the boy
   slid

10) dennis
    watermelon
Directions: Write a complete sentence for each picture using both words.

1) sailboat
   gerald

2) fishbowl
   the cat

3) candles
   tina

4) cat
   the firefighter

5) water
   the boat
6) The bridge was carried.

7) The man carried the lamp.

8) The baby tried the train.

9) Peter tried the lamp.

10) Ms. Ustead tried the train.
Directions: Write a complete sentence for each picture using both words.

1) jeff

2) the chicken

3) the farmer

4) the mechanic

5) tommy
6) **the chef**
   onion

7) **the caveman**
   fire

8) **the professor**
   wrote

9) **lance**
   raised

10) **gladys**
    fed
Directions: Write a complete sentence for each picture using both words.

1) jasmine squirrel

2) ruth head

3) the astronaut floated

4) craig wood

5) bart boat
6) 
barneyh

7) 
she

8) 
tom

9) 
doug

10) 
the firefighter

box

fence

crossed

held

ladder
Directions: Write a complete sentence for each picture using both words.

1) a bird

2) taco

3) buzz

4) bounced

5) the child

---

cage

cindy

pumpkin

---

---

---

---
6) the doctor

7) the monkey

8) the mother

9) bobby

10) lilly

listened

swung

stroller

hospital bed

street
Directions: Write a complete sentence for each picture using both words.

1) Gerri
   sandwich

2) Chris
   swing set

3) The astronaut
   space

4) Shawn
   cellphone

5) James
   splashed
6) stewie  
   sand castle

7) a bear  
   tent

8) birds
   flew

9) samantha
   makeup

10) the cat
    piano
Directions: Write a complete sentence for each picture using both words.

1) terry
   
   music

2) bob
   
   razor

3) a raccoon
   
   soda can

4) trisha
   
   teeth

5) the snake
   
   tree
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<thead>
<tr>
<th></th>
<th>Image</th>
<th>Word</th>
<th>Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td><img src="image" alt="Jason" /></td>
<td>wood</td>
<td>Jason cut the wood.</td>
</tr>
<tr>
<td>7</td>
<td><img src="image" alt="Waiter" /></td>
<td>cup</td>
<td>The waiter served the cup.</td>
</tr>
<tr>
<td>8</td>
<td><img src="image" alt="Daniel" /></td>
<td>fire</td>
<td>Daniel sat near the fire.</td>
</tr>
<tr>
<td>9</td>
<td><img src="image" alt="Patti" /></td>
<td>hung</td>
<td>Patti hung the clothes.</td>
</tr>
<tr>
<td>10</td>
<td><img src="image" alt="Nina" /></td>
<td>horse</td>
<td>Nina rode the horse.</td>
</tr>
</tbody>
</table>
Directions: Write a complete sentence for each picture using both words.

1) harold
   snow

2) simon
   match

3) the clown
   flower

4) fred
   fish

5) darrel
   painted
6) **the kid**
   - snowball

7) **he**
   - up

8) **the rabbit**
   - carrot

9) **the cat**
   - dug

10) **lance**
    - planted
Directions: Write a complete sentence for each picture using both words.

1) smelled

2) saxophone

3) walked

4) washed

5) paper
6) the judge  gavel

7) he  balloons

8) gary  calendar

9) a crook  opened

10) ian  walked
LESSON 1

Objective 1: SWBAT read paragraph of sentences and identify names something in each sentence (paragraph has some pronouns, adjectives)

Model (only teacher writes)

1. Find part A on your worksheet. The instructions say underline the part of each sentence that names something.

2. Find number 1. Each sentence in this passage names something and then tells more.

3. I’ll read the first sentence. An old red bike sat in the yard for years. What words name something? “An old red bike.” Underline an old red bike.


7. Next: She painted the bike bright red. Who does that sentence name? “She.” Underline she.

8. Next: She put new tires on the bike. Who does that sentence name? “She.” Underline she.


10. Last sentence: The girl liked the bike. Who does that sentence name? “The girl.” Underline the girl.

High prompt: Repeat the above steps on the next paragraph. YOU and THE STUDENT write on the sheets.

Medium Prompt: Repeat the above steps on the next paragraph. THE STUDENT is the only one to write.

Low Prompt: Student independently completes the next paragraph, with no help. The teacher reviews.
Objective 2: SWBAT see a correct and incorrect paragraph and fix the capitalization and punctuation errors in the paragraph.

High prompt (you and student write at same time):

1. Find part B on your sheet. The instructions say read the correct paragraph and fix up the paragraph that’s not correct. The bottom paragraph is not written correctly. Fix up the bottom paragraph so that each sentence begins with a capital and ends with a period.

2. I’ll read each sentence. Change the capital letters and periods as I read.

3. First sentence: Capital T The animals were at work period.
   Next sentence: Capital B Beavers cut down trees to make dams period.
   Next sentence: Capital S Squirrels gathered nuts for the winter period.
   Next: Capital F Field mice made little tunnels under the ground period.
   Next: Capital R Robins searched for twigs to put their nests period.

4. Check over your incorrect paragraph. Make sure each sentence begins with a capital letter and ends with a period.

Medium Prompt: Repeat the above steps on the next paragraph. THE STUDENT is the only one to write.

Low Prompt: Student completes the next paragraph independently, with no help. The teacher reviews.

CHECKOUT FOR LESSON 1

I want to see how well I taught you today’s lesson. You will complete this worksheet by yourself.

(To proceed to Lesson 2 tomorrow, student needs to score at least 90% on the checkout. If they score below, repeat Lesson 1 the next day).
Lesson 1

Objective 1: SWBAT read paragraph of sentences and identify names something in each sentence (paragraph has some pronouns, adjectives)

Instructions: Underline the part of each sentence that names something.

1. An old red bike sat in the yard for years. That bike became rusty. It had spider webs on the wheels. A girl decided to fix up the bike. She painted the bike bright red. She put new tires on the bike. The bike looked great. The girl liked the bike.

2. A little gray cat looked for its owner. It looked and looked. The poor cat was hungry. The cat made a lot of noise. It went up one street and down another. The cat found its master. That little cat felt very happy.

3. Bill had a smart dog. The dog could do many tricks. It could walk on its back legs. It could jump through a hoop. All the children liked to play with the smart dog.

4. A hungry little cat walked into a restaurant. It wanted something to eat. A nice lady owned the restaurant. She gave the cat a bowl of milk. The little animal drank every drop of milk. The woman liked the cat. She made a little bed for it. The cat had a new home.

Objective 2: SWBAT see a correct and incorrect paragraph and fix the capitalization and punctuation errors in the paragraph.

Instructions: Read the correct paragraph and fix up the incorrect paragraph.

1. Correct
The animals were at work. Beavers cut down trees to make dams. Squirrels gathered nuts for the winter. Field mice made little tunnels under the ground. Robins searched for twigs to put their nests.

1. Not correct
The animals were at work  beavers cut down trees to make dams  squirrels gathered nuts for the winter  field mice made little tunnels under the ground  robins searched for twigs to put their nests

2. Correct
A young boy threw a ball. The ball went over his friend’s head. It rolled into the street. A big truck ran over the ball. The truck driver gave the boys a new ball. They thanked the truck driver.

2. Not correct
A young boy threw a ball  the ball went over his friend’s head  it rolled into the street  a big truck ran over the ball  the truck driver gave the boys a new ball  they thank the truck driver

3. Correct
A boat was sinking. The passengers jumped off the side of the boat. A large whale swam over to the people. They climbed on the whale. It took the people back to the shore.

3. Not correct
A boat was sinking  the passengers jumped off the side of the boat  a large whale swam over to the people  they climbed on the whale  it took the people back to the shore
Lesson 1 Checkout

**Instructions:** Read the correct paragraph and fix up the incorrect paragraph.

**Correct**

The red bird flew from the cage. She sang as she flew from the door. A blue bird saw her through the window. The blue bird stopped and looked. They flew off together.

**Not correct**

the red bird flew from the cage  she sang as she flew from the door  a blue bird saw her through the window  the blue bird stopped and looked  they flew off together.
LESSON 2

Objective 3: SWBAT read paragraph of sentences and identify names something in each sentence (paragraph has some pronouns, adjectives)

Medium Prompt (student only one who writes):

1. Find part A on your worksheet. The instructions say underline the part of each sentence that names something.

2. Find number 1. Each sentence in this passage names something and then tells more.

3. I’ll read the first sentence. A poor boy found a green wallet on the street. What words name something? “A poor boy.” Underline a poor boy.


5. Next sentence: The wallet was very thick. What word names something? “The wallet.” Underline the wallet.


8. Next: She asked the boy if he had seen a green wallet. Who does that sentence name? “She.” Underline she.

9. Next: The boy told her that he had found it. Who does that sentence name? “The boy.” Underline the boy.


Low Prompt: Student independently completes the next paragraph, with no help. The teacher reviews.

Objective 4: SWBAT see a run on sentence. Match the part that tells more with the correct part that names.

Part B:

Model/HP: 1 to 3.
1. A run-on is really more than one sentence. What’s a run-on? (students respond).

2. Read the run-on. (student reads run-on).

3. It has two parts that name.

4. The first part that names is_______. (teacher reads both parts that tell more).

5. The part that only tells more about _____ is _______.

6. That’s 1 simple sentence. Next.

7. The second part that names is _____. (teacher reads both parts that tell more).

8. The part that only tells more about _____ is _______.

9. That’s 1 simple sentence. So this run-on is really more than 1 sentence.

MP: 4 to 6.

1. What’s a run-on? (students respond).

2. Read the run-on (student reads run-on). It has two parts that name.

3. What’s the first part that names? (students answer).

4. Good. (teacher reads both parts that tell more).

5. What part only tells more about ____? (students answer)

6. Draw a line connecting the part that names, with the part that tells more.

7. What’s the second part that names? (students answer).

8. Good. (teacher reads both parts that tell more).

9. What part only tells more about ____? (students answer).

10. Draw a line connecting the part that names, with the part that tells more.

LP: 7 to 10.

1. Read the run-on. Connect the part that names with the part that tells more.
Objective 5: SWBAT see a run on sentence and insert correct capitalization and punctuation

Part C:

Model/HP: 1 to 4, 5 to 8.

1. A run-on sentence is really more than one sentence.

2. Read the problem.

3. What’s the first part that names? (students respond)

4. Let’s see if the rest of the sentence tells more only about _____. (teacher reads the whole sentence aloud).
   
   a. Yes – Good, it’s a simple sentence.

   b. No --- it’s really more than 1 sentence. We need to fix it.

   c. Let’s go back. Again. What’s the first part that names? (students answer).

   d. We need to find the part that tells more only about _____. (teacher reads aloud sentence again).

   e. Oh, this part only tells more about ________.

   f. That’s 1 sentence. Put a period after it. Make the next a capital.

   g. Read the first simple sentence. Get ready (students respond).

   h. Read the next simple sentence. Get ready (students respond).

MP: 9 to 15

1. A run-on is really more than 1 sentence.

2. Read the sentence.

3. What’s the first part that names? (students respond)
4. Think about this: Does it tell more only about _____, yes or no?
   a. No: Good. To yourself. Find the part that tells more only about _____. Get ready to say it. Say it: ____________________.
   b. That’s 1 sentence. Put a period after it. Make the next a capital.
   c. Say the first sentence. (students answer)
   d. Say the next sentence. (students answer).

LP: 16 to 22.

1. Read the sentence. If it’s a run-on, fix it.

CHECKOUT FOR LESSON 2

I want to see how well I taught you today’s lesson. You will complete this worksheet by yourself.

(To proceed to Lesson 3 tomorrow, student needs to score at least 90% on the checkout. If they score below, repeat lesson 2 the next day).
Lesson 2

Objective 3: SWBAT read paragraph of sentences and identify names something in each sentence

Instructions: Underline the part of each sentence that names something.

1.
A poor boy found a green wallet on the street. He looked inside. The wallet was very thick. It had enough money in it to buy a house. An old lady came by. She asked the boy if he had seen a green wallet. The boy told her that he had found it. The old lady smiled.

2.
Maria was teaching her horse to do new tricks. She loved to teach tricks to her horse. That horse learned new tricks quickly. It had already learned many tricks. It was able to count by nodding its head.

3.
The paperboy threw a newspaper. It hit our front door. My dad went and got it. The sprinkler came on. It sprayed my dad with water. He smiled and closed the door. We all started laughing. It was very funny.

Objective 4: SWBAT see a run on sentence. Match the part that tells more with the correct part that names.

Directions: Match the part that names with the part that tells more.

1. Ann hit the ball very hard my brother ran to catch it

Ann          *                  *ran to catch it.
            *hit the ball very hard.

My brother   *                  *hit the ball very hard.
            *ran to catch it.
2. The boy found a snake the snake tried to bite him

   The boy *         * found a snake.
   * tried to bite him.

   The snake *         * found a snake.
   * tried to bite him.

3. John went to the movies his sister went to the mall

   John *         * went to the mall.
   * went to the movies.

   His sister *         * went to the movies.
   * went to the mall.

4. A girl bought an old bike the bike was red and small

   A girl *         * was red and small.
   * bought an old bike.

   The bike *         * bought an old bike.
   * was red and small.

5. She petted her new dog the new dog had a bow on it.

   She *         * had a bow on it.
   * petted her new dog.

   The new dog *         * petted her new dog.
   * had a bow on it.
6. The little boy ran into the hallway. His parents yelled to slow down.

The little boy * ran into the hallway. * yelled to slow down.

His parents * yelled to slow down. * ran into the hallway.

7. The computer fell on the ground my sister started to cry.

The computer * fell on the ground. * started to cry.

My sister * started to cry. * fell on the ground.

8. My uncle came over last night the kitchen was filled with people

My uncle * came over last night. * was filled with people.

The kitchen * came over last night. * was filled with people.

9. The mailman walked by the house our dog tried to bite him

The mailman * walked by the house. * tried to bite him.

Our dog * tried to bite him. * walked by the house.
10. The basketball rolled into the street a car turned to miss it.

The basketball * rolled into the street.  
* turned to miss it.

A car * rolled into the street.  
* turned to miss it.

Objective 5: SWBAT see a run on sentence and insert correct capitalization and punctuation.

Directions: Find any run-ons and fix them up.

1. Mr. Smith ran down the street tommy was on a skateboard.

2. Mr. Smith ran down the street.

3. The TV was huge the table was broken.

4. Sadie drank some cold water.

5. The water felt very cold my sister jumped into the pool.

6. Our cat drank some milk our dog drank some water.

7. The court room was empty.

8. Peter had a hole in his sock.

9. The newspaper was wet the paperboy rode past.

10. My dress was blue my shoes were red.
11. The candle melted away.

12. The yo-yo snapped off my brother started to cry.

13. Peter slept in his bed my cousin slept on the floor.

14. I had a hole in my pocket.

15. The basketball was orange the football was brown.

16. The cow gave us milk the chicken gave us eggs.

17. The chocolate milk was very good the strawberry milk tasted bad.

18. The radio was broken.


20. The old lady walked down the street cars drove by very fast.

21. The man held a briefcase the lady had an umbrella.

22. The dog jumped through a hoop the elephant stood
Lesson 2 Checkout

Instructions: Underline the part of each sentence that names something.

The weather got very cold last night. A pipe broke in our classroom. Water poured out of the pipe. The floor was under three feet of water. The water turned to ice. The teacher almost fell over when he opened the door.
**Lesson 3**

**Objective 6:** SWBAT see a picture with multiple people (3 people or objects) and write one sentence for each someone/something.

**Medium prompt:** Only student writes

1. Find part A on your sheet. The instructions say write one sentence about each person or thing named. Remember, when you write a sentence first you name something, then you tell more.
   What do you do first? **“Name something.”**
   Then what? **“Tell more.”**

2. Look at the picture. This picture shows what happened. It gives you the name of each person or something. You’re going to make up sentences that report on what happened. The first sentence for each person is done for you.

3. Get ready. Read the first sentence about Mrs. Lee.
   **“Mrs. Lee talked on the telephone.”**
   Good. What’s another thing Mrs. Lee did?
   I’ll say: Mrs. Lee stirred the bowl with a spoon.
   Write that sentence.

4. Next sentence begins with her son. Read that sentence about her son.
   **“Her son grabbed the dog.”**
   What’s another thing He did?
   I’ll say: He held a rattle in his right hand.
   Write that sentence.

5. Next sentence begins with the cat. Read that sentence about the cat to me.
   **“The cat reached for the bird cage.”**
   What’s another thing the cat did?
   I’ll say: The cat climbed the window.
   Write that sentence.

6. Look at the bottom. There are three checks. Read check 1. **“Does each sentence begin with a capital and end with a period?”** Check your work.

7. Read check 2. **“Does each sentence name someone/something and tell more?”** Check your work.
8. Read check 3. “Do you have any run-on sentences?”

Objective 7: SWBAT see a picture with multiple people (3 people or objects) and write two sentences for each someone/something.

High Prompt: Teacher and student write

1. Find part B on your sheet. The instructions say write at least two sentences about each someone or something named. Remember, when you write a sentence first you name something, then you tell more. What do you do first? “Name something.” Then what? “Tell more.”

2. Look at the picture. This picture shows what happened. You’re going to make up sentences that report what happened for each person.

3. The picture names Matt, The dog, and Lily. We have to write at least two sentences for each person named.

4. First sentence. I need to tell more about Matt. (Student responses vary. Pick one and write it).

5. Next sentence. Tell me one more thing about Matt. (Student responses vary. Pick one and write it).

6. Good. Next person named is The Dog. Tell me more about the Dog. (Student responses vary. Pick one and write it).

7. Next sentence. Tell me one more thing about the Dog. (Student responses vary. Pick one and write it).

8. Good. Next person named is Lily. Tell me more about Lily. (Student responses vary. Pick one and write it).

9. Next sentence. Tell me one more thing about Lily. (Student responses vary. Pick one and write it).

10. Look at the bottom. There are three checks. Read check 1. “Does each sentence begin with a capital and end with a period?” Check your work.

11. Read check 2. “Does each sentence name someone/something and tell more?” Check your work.

12. Read check 3. “Do you have any run-on sentences?”
Medium Prompt: Repeat the above steps on the next paragraph. THE STUDENT is the only one to write.

Low Prompt: Student completes the next paragraph independently, with no help. The teacher reviews.

CHECKOUT FOR LESSON 3

I want to see how well I taught you today’s lesson. You will write some sentences describing each person in this picture.

(To finish lesson 3, student needs to write at least 90% complete sentences. 1 point for starting with a capital, 1 point for having a period, and 1 point for someone/something and tells more.)
Lesson 3

Objective 6: SWBAT see a picture with multiple people (3 people or objects) and write one sentence for each someone/something.

Instructions: Write one sentence about each someone or something named.

Mrs. Lee talked on the telephone. Mrs. Lee ____________________________________________ . Her son grabbed the dog. ____________________________________________ . The cat reached for the bird cage. ________________________

Check 1: Does each sentence begin with a capital and end with a period?
Check 2: Does each sentence names someone/something and tell more?
Check 3: Do you have any run-on sentences?
Objective 7: SWBAT see a picture with multiple people (3 people or objects) and write at least two sentences for each someone/something.

Instructions: Write at least two sentences about each someone or something named.

<table>
<thead>
<tr>
<th>Threw</th>
<th>looked</th>
<th>hands</th>
<th>jumped</th>
<th>ball</th>
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</tr>
</tbody>
</table>

Check 1: Does each sentence begin with a capital and end with a period?
Check 2: Does each sentence names someone/something and tell more?
Check 3: Do you have any run-on sentences?
Instructions: Write at least two sentences about each someone or something named.

Check 1: Does each sentence begin with a capital and end with a period?
Check 2: Does each sentence tell what happened, not what is happening?
Check 3: Does your second sentence about each person or thing begin with he/she/it?
Instructions: Write at least two sentences about each someone or something.

1. The mother
2. Jerry
3. Her daughter

stirred  pile  carried  logs  marshmallows

Check 1: Does each sentence begin with a capital and end with a period?
Check 2: Does each sentence names someone/something and tell more?
Check 3: Do you have any run-on sentences?
Lesson 3 Checkout

Instructions: Write at least two sentences about each person named.

spread  toast  cut  pancakes  poured

1. Officer James  2. Officer Bob  3. Officer Ann
Directions: Write a complete sentence for each picture using both words.

1) skull

2) pumped

3) hid

4) door

5) roller coaster

Name: _____________________

Date: _________________
6) ted
   hammeredd

7) she
   ice pack

8) montrell
   marshmallow

9) peter
   taped

10) the guide
    backpack
Directions: Write a complete sentence for each picture using both words.

1) fred
   window

2) jake
   watered

3) torry
   groceries

4) roger
   water

5) tony
   sat
6) 
malik 

-----

7) 
the man 

-----

8) 
teddy 

-----

9) 
the lamp 

-----

10) 
the curtain 

-----
Directions: Write a complete sentence for each picture using both words.

1) tammy dish

2) jared snowballs

3) she trimmed

4) the man waved

5) suzy took
6) the student

looked

7) the boxer

bag

8) danielle

ribbon

9) my uncle

treasure

10) the lawyer

got
Directions: Write a complete sentence for each picture using both words.

1) my brother

trampoline

2) tirrell

washed

3) the window

was

4) the teacher

piano

5) danny

bushes
6) peggy  
\[
\text{tree}
\]

7) the plumber  
\[
\text{sink}
\]

8) the neighbor  
\[
\text{raked}
\]

9) the car  
\[
\text{had}
\]

10) nick  
\[
\text{walked}
\]
Directions: Write a complete sentence for each picture using both words.

1) **reginald**
   skateboard

2) **he**
   raft

3) **kathy**
   outside

4) **harold**
   water bottle

5) **the man**
   was
6) grandpa

sat

7) the nest

was

8) nancy

bus stop

9) the sailor

shark

10) bob

table
Directions: Write a complete sentence for each picture using both words.

1) Denise

2) The cook

3) The refrigerator

4) The suitcase

5) Carla

---

firewood

pot

open

fell

tossed
6) tammy
   watered

7) greg
   trash

8) the robber
   stole

9) the toaster
   had

10) the waiter
    plate
Directions: Write a complete sentence for each picture using both words.

1) shirley

wore

2) the trashbag

ripped

3) denise

pool

4) patricia

mower

5) david

street
6) michelle rowed

7) the seal balanced

8) my dad newspaper

9) the man leaned

10) tina opened
Directions: Write a complete sentence for each picture using both words.

1) the man darts

2) tony pizza

3) the diver flippers

4) debrah bench

5) harold trash
6) 
\[ \text{ted} \] 
\[ \text{drew} \]

7) 
\[ \text{danny} \] 
\[ \text{fixed} \]

8) 
\[ \text{tyler} \] 
\[ \text{had} \]

9) 
\[ \text{roger} \] 
\[ \text{jumped} \]

10) 
\[ \text{perry} \] 
\[ \text{golf} \]
Directions: Write a complete sentence for each picture using both words.

1) the mouse  
cheese

2) he  
dog

3) the clown  
unicycle

4) the chief  
shot

5) the singer  
played
6) **ms. davis**

   microscope

7) **the clerk**

   drawer

8) **mike**

   hit

9) **the small girl**

   dusted

10) **the man**

    held
Directions: Write a complete sentence for each picture using both words.

1) frankie listened

2) joe letters

3) the oven caught

4) robert video game

5) the little girl rocking horse
6) nick rode

7) the old man stick

8) the stock boy stacked

9) tim sprinkler

10) the baby tossed
Directions: Write a complete sentence for each picture using both words.

1) teddy
   cut

2) greg
   hung

3) kareem
   tied

4) the small dog
   stood

5) joan
   pointed
6) hedi
   vacuum

7) my brother
   painted

8) the genie
   lamp

9) ryan
   toolbox

10) the fortune teller
    crystal
Directions: Write a complete sentence for each picture using both words.

1) shawn

apple

2) my dad

hot dogs

3) sam

talked

4) dan

photo

5) the key

fell
6) the chef  lobster

7) the goalie  dove

8) the lamp  table

9) timmy  built

10) the superhero  flew
Directions: Write a complete sentence for each picture using both words.

1) ms. rice opened

2) tight rope

3) jill roasted

4) mike tire swing

5) tray

the waitress
6) my cousin

piano

7) louie

trumpet

8) harold

telephone

9) peter

table tennis

10) the mailman

door
Directions: Write a complete sentence for each picture using both words.

1) nick

2) my brother

3) jane

4) gwen

5) michelle

panda

laid

piggy bank

planted

carried
6) jernika

7) the cowboy

8) breanne

9) ben

10) her grandmother

apples

rode

computer

mopped

worked
Directions: Write a complete sentence for each picture using both words.

1) clark  
   horse

2) gary  
   spilled

3) harold  
   ladder

4) the old man  
   turned

5) ted  
   fire
6) **frank**
   ![Image of a man working on a roof]
   **roof**

7) **he**
   ![Image of a man on a raft]
   **raft**

8) **oranges**
   ![Image of a person holding oranges]
   **fell**

9) **the magician**
   ![Image of a magician with a rabbit]
   **rabbit**

10) **the soldier**
    ![Image of a soldier wearing a mask]
    **mask**
Directions: Write a complete sentence for each picture using both words.

1) a seal
   nose

2) the kid
   basketball

3) kathy
   book

4) sally
   milk

5) she
   desk
6) sammy

7) the painter

8) the spaceship

9) the kid

10) greg

fed

tree

space

soccer

weights
Directions: Write a complete sentence for each picture using both words.

1) the butler

2) the train

3) bruce

4) the puppy

5) mom
6) bob  chess

7) wesley  mirror

8) gary  mopped

9) lilly  knitted

10) molly  airplane
Directions: Write a complete sentence for each picture using both words.

1) Karl

bull

2) Oscar

mailed

3) Zach

opened

4) Neil

held

5) Samuel

got
6) the barber
   cut

7) the cook
   egg

8) dwight
   covered

9) harold
   sprinkled

10) grandma
    had
Directions: Write a complete sentence for each picture using both words.

1) the teacher
   book

2) the wind
   stamps

3) the radio
   music

4) frank
   was

5) ms. davis
   stood
6) skye

7) sam

8) the boxer

9) danny

10) the robber

cards

window

hit

cooler

money
Directions: Write a complete sentence for each picture using both words.

1) the monk

2) susan

3) the firefighter

4) the kid

5) the doctor
6) the young boy  fed

7) the girl  cat

8) the library  caught

9) carl  violin

10) sally  ironed
Directions: Write a complete sentence for each picture using both words.

1) tony
   coffee

2) paul
   hung

3) tina
   mustard

4) stuffed animal
   stuffed animal

5) jake
   drums
6) **randal**

   **fire**

7) **she**

   **held**

8) **the firefighter**

   **ladder**

9) **mike**

   **egg**

10) **the elephant**

    **water**
Directions: Write a complete sentence for each picture using both words.

1) **tom**
   rowed

2) **harold**
   built

3) **he**
   hot dog

4) **stan**
   flat tire

5) **stan**
   nose
6) max
   chair

7) the doctor
   gave

8) the cave
   hid
   woman

9) my dad
   dishes

10) the robber
    purse
Directions: Write a complete sentence for each picture using all 3 words.

1)  
   my mom looked

2)  
   the man lemonade

3)  
   the diver treasure

4)  
   danny donuts

5)  
   sammy ice cream
6) the bird

   wing

7) jake

   sandwich

8) the child

   cookie jar

9) peter

   bed

10) the woman

    spider
Instructions: Write sentences describing the picture below.

The painter

David

Tina

held    painted    brush    microphone    canvas

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Name: _____________

Descriptive Paragraph Assessment
Instructions: Write sentences describing the picture below.

Harold

The dog

The newspaper boy

balloon jumped flew bag walked
Descriptive Paragraph Assessment

Instructions: Write sentences describing the picture below.

sat  scissors  mustache  book  hair

The barber

Rick

Tom
**Instructions:** Write sentences describing the picture below.

- Kip
- Sally
- The snake
- horse
- jumped
- hissed
- hat
- rope
Instructions: Write sentences describing the picture below.

- boat
- fishing pole
- fish
- paddle
Descriptive Paragraph Assessment
**Instructions:** Write sentences describing the picture below.

Gwen

Simon

Mike

line  bread  cart  headphones  bottle
Instructions: Write sentences describing the picture below.

- Denise
- The boy
- Betty

read  basketball  cellphone  bags  straw

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Denise is holding a basketball. The boy is standing in the background. Betty is sitting on the bench. Denise is also holding a straw and a cellphone.
Instructions: Write sentences describing the picture below.

The scientist

Dr. Mason

Dr. Oz

glass  machine  magnifying glass  liquid
Descriptive Paragraph Assessment

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Descriptive Paragraph Assessment

Instructions: Write sentences describing the picture below.

The father

rattle  vacuum  book  shake  clean

The mother

The baby
Descriptive Paragraph Assessment
Instructions: Write sentences describing the picture below.

Name: _____________

Date: _____________

Descriptive Paragraph Assessment

Deloris

The cook

The cashier

slipped  flipped  money  plate  telephone
Descriptive Paragraph Assessment
Instructions: Write sentences describing the picture below.

book  cell phone  bag  locker  glasses

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Descriptive Paragraph Assessment
Descriptive Paragraph Assessment

**Instructions:** Write sentences describing the picture below.

Adam  

Ian  

David  

---

rings  
birds  
rabbit  
pulled  
flew  

---

---

---
Instructions: Write sentences describing the picture below.

tomatoes  cut  cooked  burgers  salad
Descriptive Paragraph Assessment

Instructions: Write sentences describing the picture below.

stood hoop sunglasses hat ball

1. A boxer
   2. A poodle
   3. A collie

EXTENDED COMPOSITION

Objective: SWBAT write sentences about the picture.

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Descriptive Paragraph Assessment

**Instructions:** Write sentences describing the picture below.

- fishing pole
- waved
- food
- rock

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Descriptive Paragraph Assessment

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SHAWN M. DATCHUK

The Pennsylvania State University
216-A CEDAR
University Park, PA 16802
814-321-4485
smd320@psu.edu

Home Address
119 East High Street
Apt. 4
Bellefonte, PA 16823

Education
PhD Pennsylvania State University Special Education
(anticipated date Dec. 2011)
MEd 2007 Pennsylvania State University Special Education
BA 2004 Youngstown State University Psychology

Professional Experiences
2010-2011 Penn State University Instructor and Field Experience Supervisor
2008-2009 Director of Special Education, New Orleans College Preparatory
       Charter Middle School
2007-2009 Special Education Teacher, Grades 6-8, New Orleans College
       Preparatory Charter School

Other Educational Experiences/Certifications
Certified teacher, K-12 high incidence disabilities and elementary education K-4.

Scholarships/Recognition
2010 Council for Exceptional Children – Division of Research, Scholar
       Recipient
2008 Recognition for Outstanding Teaching, Board of Directors, New
       Orleans College Preparatory Charter School
2006 Robert M. Eisman Grant for Autism Research, Pennsylvania State
       University
2004 Charles Dobson Award for Outstanding Undergraduate Research
       in Psychology, Youngstown State University

Professional Associations
The Council for Exceptional Children (subdivisions: DLD)
Association for Applied Behavior Analysis
Standard Celeration Society