IMPROVING WRITTEN LANGUAGE PERFORMANCE OF ADOLESCENTS WITH ASPERGER SYNDROME

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The effects of a multicomponent intervention involving self-regulated strategy development delivered via video self-modeling on the written language performance of 3 students with Asperger syndrome were examined. During intervention sessions, each student watched a video of himself performing strategies for increasing the number of words written and the number of functional essay elements. He then wrote a persuasive essay. The number of words written and number of functional essay elements included in each essay were measured. Each student demonstrated gains in the number of words written and number of functional essay elements. Maintenance of treatment effects at follow-up varied across targets and participants. Implications for future research are suggested.

DESCRIPTORS: adolescents, autism, academic behavior, video modeling, writing

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Writing is a complex process that involves planning, drafting, self-monitoring, and revising text. Students with Asperger syndrome display more variability in their written language performance on standardized tests than nondisabled students and produce writing samples that are brief and less complex (Myles et al., 2003). Because writing skills may affect later job performance, it is important to identify effective writing interventions for this population (Klin, McPartland, & Volkmar, 2005). The self-regulated strategy development (SRSD) model developed by Graham, Harris, MacArthur, and Schwartz (1991) has been evaluated in numerous studies with children with learning disabilities (Graham & Harris, 2003). Results of these studies indicate that when children with learning disabilities are taught writing strategies and self-regulation procedures (e.g., goal setting, self-monitoring, and self-reinforcement), both the quantity and quality of their writing improve (De La Paz,

1999, 2001; De La Paz & Graham, 1997; Graham & Harris, 1989; Troia, Graham, & Harris, 1999). SRSD instruction provides students with strategies for planning, writing, revising, editing, and monitoring their own writing (Harris, Schmidt, & Graham, 1998). SRSD involves interactive learning between teacher and student and is structured so that students gradually learn to select and implement specific writing strategies independently. Graham and Harris (2003) conducted a meta-analysis of SRSD writing studies and reported the average effect size for students with learning disabilities to be 1.86 for length and above 2.0 for structural elements. To date, SRSD has not been evaluated with individuals with Asperger syndrome.

Video self-modeling is a versatile intervention that capitalizes on the potency of observational learning. Participants watch themselves in videos in which they accurately perform a targeted skill (Dowrick, 1999). Video self-modeling has been used to improve academic skills such as on-task behavior (Clare, Jenson, Kehle, & Bray, 2000), reading fluency and comprehension (Hitchcock, Prater, & Dowrick, 2004), and math performance (Schunk & Hanson, 1989). Video modeling has been

evaluated with individuals with autism to teach a variety of social, communication, and functional skills (Ayres & Langone, 2005), but academic skills have not been targeted with this population. Charlop-Christy, Le, and Freeman (2001) suggested that video modeling may facilitate faster skill acquisition and generalization than in vivo modeling for individuals with autism.

The purpose of this exploratory study was to evaluate SRSD instruction, an empirically supported intervention for individuals with learning disabilities, delivered via video self-modeling with a novel population, adolescents with Asperger Syndrome. The effects of this intervention package on the rate of words written and rate of functional essay elements were examined.

METHOD

Participants and Setting

Three adolescents (Peter, Alan, and Justin) participated in the study. Their scores on the Asperger Syndrome Diagnostic Scale (Myles, Bock, & Simpson, 2001) supported a diagnosis of Asperger syndrome (i.e., Asperger syndrome quotient scores of 116, 105, and 114, respectively) and each identified writing as an area of difficulty. Peter, age 13 years 6 months, attended a private school and was in the eighth grade. Alan, age 15 years 11 months, attended a public high school and was in the 10th grade. Alan received special education resource room services but attended general education classes. Justin, age 17 years 4 months, attended a private school and was in the 10th grade. Justin received all academic instruction in a small-group setting. All experimental sessions took place in a conference room near the researcher's office.

Dependent Measures

Data were collected on the number of words written, defined as all written words, regardless of spelling, that represented a spoken word (Graham & Harris, 1989); and the number of functional essay elements, defined in accordance with the procedures outlined by Graham and Harris in which the total number of functional essay elements is calculated by counting the number of premises, reasons, conclusions, and elaborations. Data were collected on the duration of sessions, because students were free to work on the task for as long as they chose. Interobserver agreement was assessed across all experimental conditions and participants. An agreement check was conducted with 33% of the essays written. Agreement was calculated for the number of words written by dividing the smaller obtained number of words written by the larger and multiplying by 100%, and was 98%. Point-by-point agreement was calculated for the number of essay elements by having two raters code each statement as an essay element (e.g., premise, reason, elaboration, conclusion) or not an element. The number of agreements were then divided by the number of agreements and disagreements and multiplied by 100%. Agreement was 87%.

Experimental Design and Procedure

A multiple baseline design across responses (words written and functional essay elements) was used to assess the effects of the SRSD intervention package that sequentially targeted words written and functional essay elements. Procedures were implemented separately for each participant.

Baseline. During baseline writing sessions, the experimenter provided the student with a persuasive writing prompt and asked the student to write an essay to go with it. The persuasive writing prompts required students to write to convince someone to agree with their position on an issue and prompts were similar to prompts for secondary students used by the Florida Writing Assessment Program (FWAP; 2003). Each prompt provided students with a writing situation (e.g., *The principal of your school has been asked to decide if students may use cell phones at school*) and directions for writing (e.g., *Write to*

convince your principal to agree with your point of view on the use of cell phones in school). Once during baseline, each student was given an expository prompt instead of a persuasive prompt. Expository prompts were presented in the same format as persuasive prompts; however expository prompts directed the student to write to explain how or why (e.g., *Choose a job and explain why you would not like to have that job*) (FWAP). Baseline sessions ended when the student said he was finished writing his essay.

SRSD intervention: Words written. After initial baseline data collection, each student participated in one 30-min session with the experimenter to create a video of the student modeling a self-monitoring strategy (see Graham & Harris, 2005, for a description of the strategy). The experimenter provided the student with a bar chart, sample essay, and written script that discussed the purpose of the self-monitoring strategy and described how to implement it. After reviewing the script, the student was instructed to "make a movie about the self-monitoring strategy." Following the script, the student talked aloud as he modeled the strategy by counting the number of words in his essay, recording the number on a bar chart, determining if he met his goal, and setting a new goal to increase his writing output by at least 10% in his next essay. Close-up shots were taken of the bar chart as the student recorded his performance and new goal. During the filming, the experimenter provided verbal prompts as needed. After the session, the experimenter edited the video to remove all verbal prompts and to make certain that the script was not visible in the video.

At the beginning of each intervention session, the student viewed the video about self-monitoring. The student then engaged in behaviors that had been trained and was given the materials (e.g., blank bar chart, paper, pencil) to do so. After the student demonstrated at least a 10% increase in the total number of words written for three consecutive sessions, he

began instruction on the second skill and no longer viewed the self-monitoring video.

SRSD intervention: Functional essay elements. Each student participated in one 60-min session with the experimenter to create a video of the student modeling a strategy (see Graham & Harris, 1989, for a description of the strategy) using the mnemonic TREE (note topic sentence, note reasons, explain each reason, note ending) (Graham & Harris, 2005) to plan and write a persuasive essay. The student talked aloud according to the script, and close-up shots were taken of the TREE outline as the student completed it. At the beginning of subsequent intervention sessions, the student viewed the video about composing a persuasive essay. The student then engaged in behaviors that had been trained and was given the materials (e.g., blank TREE outline, paper, pencil) to do so.

Generalization. Generalization probes were conducted during each phase of the study. These sessions followed baseline procedures except that the student was given an expository essay writing prompt instead of a persuasive essay writing prompt.

Follow-up. Follow-up probes were conducted 1 week and 3 months after the final intervention sessions.

RESULTS AND DISCUSSION

The results for Alan, Peter, and Justin are shown in Figure 1. During baseline, students wrote essays ranging from 11 to 121 words and included few functional essay elements in their writing. The average number of words written in baseline were 100 for Alan, 52 for Peter, and 17 for Justin. When the SRSD intervention for words written was introduced, each student showed gains in the number of words written (384, 102, and 46 words for Alan, Peter, and Justin, respectively). During baseline, session duration averaged 52 min for Alan, 22 min for Peter, and 12 min for Justin. Session duration increased markedly to 82 min for Alan, increased gradually over the course of sessions to
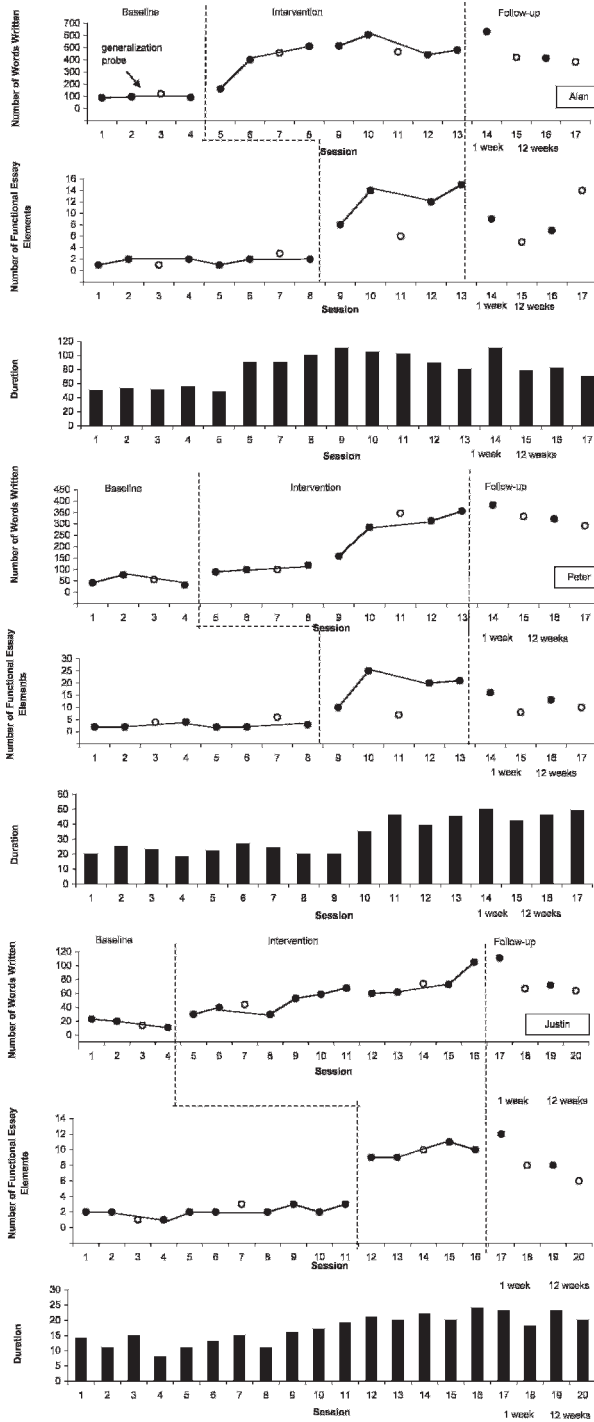
Figure 1.   Performance on number of words written, number of functional essay elements per essay and duration of sessions in minutes for Alan, Peter, and Justin.

an average of 15 min for Justin, and increased minimally to 23 min for Peter. Thus, the intervention for words written resulted in all participants writing more words, and 2 of 3 participants wrote for longer periods of time. Similar changes in performance relative to baseline were observed when the students were asked to write expository essays, indicating generalization of effects from persuasive to expository essays.

When the SRSD intervention for functional essay elements was introduced, the average number of words written increased for each student. This suggests that targeting functional essay elements may have increased words written because more words are needed to increase functional essay elements; however, additional research is needed to determine if that is the case.

Students did not show an increase in the frequency of functional essay elements when words written were targeted; they did so only when the component that targeted functional essay elements was introduced. During baseline, students included zero to six functional essay elements in their writing samples. Alan averaged two elements, Peter averaged three elements, and Justin averaged two elements in baseline. All participants' number of functional essay elements increased with the introduction of the intervention. Peter's number of elements increased to an average of 17, Alan's increased to 11, and Justin's increased to 10. During the intervention, the average session duration increased further to 97 min, 37 min, and 21 min for Alan, Peter, and Justin, respectively. Thus, the intervention resulted in participants writing more functional essay elements and working for longer periods of time.

Alan and Peter maintained gains in number of words written at 1-week and 3-month follow-up probes; Justin's performance decreased at the 3-month probe, but he continued to exceed his baseline performance. Improvements in number of functional essay elements

written were not maintained for Alan and Peter and declined for Justin over time. Duration of sessions at follow-up decreased for Alan but remained above baseline levels; duration was maintained for Peter and Justin (85 min, 47 min, and 21 min, respectively).

The SRSD package examined in this exploratory study was an effective intervention that produced lasting changes in number of words written by 3 adolescents with Asperger syndrome. However, because social validation data were not collected, it is not possible to address the issue of applied significance for any of the participants. Future studies should address social validation. The intervention was also effective in improving the number of functional essay elements the adolescents included in their essays; however, none maintained significant gains after 3 months. This may suggest the need for a longer intervention period. This study extends the SRSD literature because it is the first time it was delivered via video and it is the first time it was evaluated with adolescents with Asperger syndrome.

There are several limitations to the current study that may be addressed in future research. First, neither video self-modeling nor strategy instruction was evaluated in isolation. Therefore, it is not possible to attribute the results obtained to any one component of the intervention. A component analysis of this intervention should be completed as a next step. Because the intervention is complex and time consuming, it will be important for future research to examine the use of SRSD without video self-modeling. In each intervention condition, students showed improvement after watching the video once, so it seems possible that the creation of videos may have saved time in the long run over repeated sessions. However, this must be examined with additional studies. Likewise there is a need to compare the use of video self-modeling and peer modeling. An initial study (Sherer et al., 2001) suggested that self-models may not be more effective than peer

models, but more data are needed to compare these procedures. In addition, only a few studies involving students with autism have evaluated video self-modeling. This might be because additional time and effort may be needed to create and edit self-modeling tapes. Video self-modeling was used as part of the intervention package in this study because it was predicted that because the participants were able to read scripts and follow directions, the creation and editing of self-modeling videos would not be more labor intensive than the creation of peer-modeling videos. It was also hypothesized that video self-modeling may increase the characteristics that promote attention to the model (Creer & Miklich, 1970) and contribute to the intervention's potency. Again, further study is needed to compare these procedures in terms of intervention effects and efficiency. Similarly, because the videos used in this study may have served as prompts, it will be important to compare the use of video to a simple visual prompt.

Another limitation of this study is its reliance on production-type measures. Future studies may include production-independent measures and further evaluate the quality of student writing. Finally, the brevity of each phase and the artificial setting are limitations. In conclusion, this exploratory study provides an initial evaluation of an SRSD intervention package to address the writing performance of adolescents with Asperger syndrome, and it provides many directions for systematic research.

REFERENCES

Ayres, K., & Langone, J. (2005). Intervention and instruction with video for students with autism: A review of the literature. *Education and Training in Developmental Disabilities*, 40, 183–196.

Charlop-Christy, M., Le, L., & Freeman, K. (2000). A comparison of video modeling with in vivo modeling for teaching children with autism. *Journal of Autism and Developmental Disorders*, 30, 537–552.

Clare, S., Jenson, W., Kehle, T., & Bray, M. (2000). Self-modeling as a treatment for increasing on-task behavior. *Psychology in Schools*, 37, 517–522.

Creer, T. L., & Miklich, D. R. (1970). The application of a self-modeling procedure to modify inappropriate behavior: A preliminary report. *Behavior Research and Therapy*, 8, 91–92.

De La Paz, S. (1999). Self-regulated strategy instruction in regular education settings: Improving outcomes for students with and without learning disabilities. *Learning Disabilities Research and Practice*, 14, 92–196.

De La Paz, S. (2001). Teaching writing to students with attention deficit disorders and specific language impairments. *Journal of Educational Research*, 95, 37–47.

De La Paz, S., & Graham, S. (1997). Strategy instruction in planning: Effects on the writing performance and behavior of students with learning difficulties. *Exceptional Children*, 63, 167–181.

Dowrick, P. W. (1999). A review of self modeling and related interventions. *Applied Preventative Psychology*, 8, 23–29.

Florida Writing Assessment Program. (2003). *Description of writing scores*. Retrieved October 5, 2004, from http://www.firn.edu/doe/sas/flwrites.htm

Graham, S., & Harris, K. R. (1989). Improving learning disabled students' skills at composing essays: Self-instructional strategy training. *Exceptional Children*, 56, 201–214.

Graham, S., & Harris, K. R. (2003). Students with learning disabilities and the process of writing: A meta-analysis of SRSD studies. In L. H. Swanson, K. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 323–344). New York: Guilford.

Graham, S., & Harris, K. R. (2005). *Writing better: Effective strategies for teaching students with learning difficulties*. Baltimore: Brookes.

Graham, S., Harris, K. R., MacArthur, C., & Schwartz, S. (1991). Writing and writing instruction for students with learning disabilities: Review of a research program. *Learning Disability Quarterly*, 14, 89–114.

Harris, K., Schmidt, T., & Graham, S. (1998). Every child can write: Strategies for composition and self-regulation in the writing process. In K. Harris, S. Graham, & D. Deshler (Eds.), *Advances in teaching and learning* (pp. 131–167). Cambridge, MA: Brookline Books.

Hitchcock, C., Prater, M., & Dowrick, P. (2004). Reading comprehension and fluency: Examining the effects of tutoring and video self-modeling on first grade students with learning difficulties. *Learning Disability Quarterly*, 27, 89–103.

Klin, A., McPartland, J., & Volkmar, F. R. (2005). Asperger syndrome. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders: Vol. 1. Diagnosis, development, neurobiology, and behavior* (pp. 88–125). Hoboken, NJ: Wiley.

Myles, B., Bock, S., & Simpson, R. (2001). *Asperger syndrome diagnostic scale*. Austin, TX: Pro-Ed.

Myles, B., Huggins, A., Rome-Lake, M., Hagiwara, T., Barnhill, G., & Griswold, D. (2003). Written language profiles of children and youth with Asperger syndrome: From research to practice. *Education and Training in Developmental Disabilities*, 38, 362–369.

Schunk, D. H., & Hanson, A. R. (1989). Self-modeling and children's cognitive skill learning. *Journal of Educational Psychology, 81*, 155–163.

Sherer, M., Pierce, K. L., Paredes, S., Kisacky, K. L., Ingersoll, B., & Schreibman, L. (2001). Enhancing conversation skills in children with autism via video technology: Which is better, ''self'' or ''other'' as model? *Behavior Modification, 25*, 140–158.

Troia, G., Graham, S., & Harris, K. R. (1999). Teaching students with learning disabilities to mindfully plan when writing. *Exceptional Children, 65*, 235–252.