

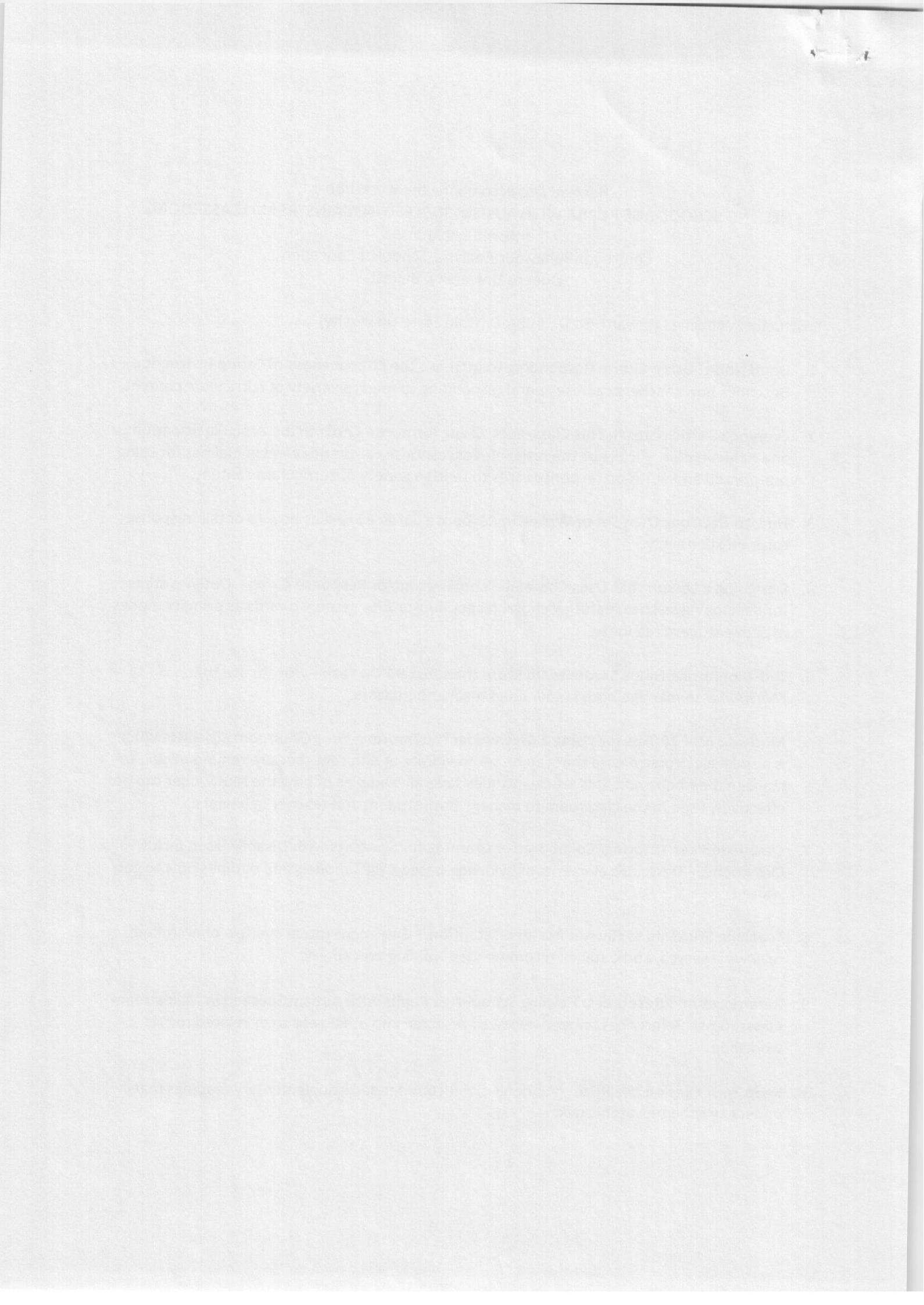
Handouts to accompany the workshop
HELPING SCHOOL-AGE PUPILS WITH AUTISM SUCCEED IN MAINSTREAM CLASSROOMS

~ April 13, 2013 ~

Centre for Behaviour Analysis, School of Education
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1. **Good Noise! Using Choral Responding to Increase the Effectiveness of Group Instruction** – Describes how teachers can use choral responding to teach a variety of curriculum content.
2. **Everyone Participates in This Classroom: Using Response Cards to Increase Participation and Achievement** – Explains the rationale for response cards and offers guidelines for using pre-printed and write-on response cards to teach a variety of curriculum content.
3. **How to Get Your Own Set of Write-On Response Cards** – Explains how to obtain response cards inexpensively.
4. **Designing a Lesson that Uses Choral Responding and/or Response Cards** – Outlines steps for developing lessons featuring choral responding and/or response cards as primary modes of active student response.
5. **Self-Monitoring Helps Students Do More than Just Be On Task** – How to use the MotivAider to manage both student and teacher behaviors.
6. **Motivate Me! 20 Tips for Using a MotivAider® to Improve Your Classroom** -The MotivAider is a small electronic device that can be set to vibrate at different times to remind people to manage their behavior. This article includes several examples of how the MotivAider can be effectively used in the classroom to manage both student and teacher behaviors.
7. **Classwide Peer Tutoring: Collaborative Learning for Students with Disabilities in Inclusive Classrooms** – Describes elements of evidence-based CWPT models and outlines how to get started.
8. **Teaching Students to Recruit Positive Attention** – Gives conceptual overview of recruiting, reviews research, and outlines recommended training procedures.
9. **References and Resources: Helping School-Age Pupils with Autism Succeed in Mainstream Classrooms** - References to peer-reviewed research and other resources related to this workshop.
10. **Keep Your Eyes on the Prize** – A brief list of recommended/supplementary readings that underscore themes of this talk.



Wood & Heward

Good Noise - 1

Running head: CHORAL RESPONDING

Good Noise!

Using Choral Responding to Increase the Effectiveness of Group Instruction

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Good Noise!

Using Choral Responding to Increase the Effectiveness of Group Instruction

It's an unseasonably warm, spring afternoon and the end of the school year is fast approaching. Miss Witney is worried because she still hasn't completed her unit on multiplication facts. She moves about the classroom observing her second graders as they work in pairs, separating small blocks into piles of five. Emily and Jared raise their hands, point to their block piles, and peer up at Miss Witney, who smiles and says, "You got it! That's 5 times 4!" From across the room Anthony hollers, "I don't get it!" Miss Witney isn't surprised. Anthony, a student recently identified as learning disabled, usually doesn't get it. Miss Witney pauses and takes a deep breath. She scans the room and realizes that, besides Emily and Jared, only a few other students seem to be catching on. Several children are gazing out the window at the playground. A horrible noise fills the room as blocks begin to spill off desks, papers crumple, and pencils grind in the sharpener. "Please listen!" shouts Miss Witney. The children freeze. "We've been going over these multiplication facts every day for two weeks. Don't you understand?" Unfortunately, most of the children didn't.

On the way home Miss Witney remembers the special education teacher, Mr. Watts, telling her about a group instruction technique he uses called choral responding. "Maybe I'll give it a try," she mutters to herself.

* * * * *

Teachers, like Miss Witney, recognize the importance of actively engaging students during group instruction. A common strategy teachers use to encourage student participation is having students work with partners (e.g., cooperative learning). Students benefit from cooperative learning activities when the format is structured to promote active and frequent participation (e.g., Classwide Peer Tutoring) (Delquadri et al., 1986; Miller, Barbeta, & Heron, 1994).

Unstructured cooperative learning strategies, however, have limitations. Teachers find it difficult to keep all students on-task during the lesson. High achieving students frequently participate while others sit passively. This creates unwanted downtime that encourages students' off-task behavior. In many cases, low-performing students (e.g., students with learning disabilities) do not participate enough to achieve meaningful learning outcomes (Maheady, Mallete, Harper, & Saca, 1991).

Another common strategy teachers use to obtain student participation during group instruction is to pose a question or problem to the entire class and then call upon one student to answer. This provides an active learning opportunity for only the student who is called upon and often results in more frequent responses by high-achieving students and few or no responses by low-achieving students (Maheady et al., 1991).

An alternative to the unstructured cooperative learning and one-student-at-a-time methods of student participation is choral responding.

What Is Choral Responding?

Choral responding (CR) is a teaching technique that allows all students to respond aloud and in unison to a teacher-directed question (Heward, Courson, & Narayan, 1989; Sainato et al., 1987; Sindelar, Bursuck, & Halle, 1986). CR is nothing new. It has been around since the days of the one-room schoolhouse. CR has always been and continues to be a popular instructional method in foreign language classes. Remember your French teacher? Répétez-moi!

CR is the easiest of several methods (e.g., response cards, peer tutoring, timed math drills) for increasing active student response (ASR) during group instruction (Gardner, Heward, & Grossi, 1994; Miller & Heward, 1992). When ASR is counted and reported as frequency per lesson or rate per minute, it becomes a precise, response-based measure of learning (Heward, 1994). Research has shown that increased ASR is functionally related to academic achievement (Barbetta, Heron, & Heward, 1993; Cavanaugh, Heward, & Donelson, 1996; Narayan, Heward, Gardner, Courson, & Omness, 1990; Sainato, Strain, & Lyon, 1988). Research on choral responding has demonstrated a strong relationship between frequent student response during instruction and improved learning outcomes (see box 1).

CR has several advantages over one-student-at-a-time questions and answers (Heward, Courson, & Narayan, 1989; Lingenfelter, 1990). First, CR allows the teacher to present many opportunities for *all* students to actively participate. Second, it gives the teacher immediate feedback on whether or not the students are “getting it” and if review is needed. Third, because CR requires all students to participate, it is an effective strategy for including students with special learning needs in general education classrooms. Fourth, CR builds confidence in low achieving students by allowing them to perform well in front of their peers (Heward, Courson, & Narayan, 1989). Finally, when students are engaged in CR, off-task and disruptive behaviors are reduced (Heward, 1994).

Here is an example of CR used in an inclusive first grade classroom. Ms. Finch’s first graders have just finished reading a story about a young boy named Howard. Ms. Finch puts her storybook on her lap, holds up her hand and says, “Class, get ready to tell me the main character in today’s story.” She says, “Think big,” drops her hand as a signal, and the students chime in “Howard!” “Howard is right,” exclaims Ms. Finch. “Way to go!” She asks ten more quick questions – some about the setting and main idea. “Last one. Here we go. The problem Howard faced was finding his lost dog. Is that true or false? Think about it.” She signals and the students eagerly respond, “False!” The students laugh and so does Ms. Finch. “I couldn’t trick you, could I?” she asks. “Tell me why that’s false.” She calls on James who is frantically waving his hand to answer.

How To Do Choral Responding

Select Curricular Content

- *Select curricular content appropriate for short questions and answers.* Choose content for which students can make frequent responses (e.g., stating the vocabulary word for definitions, naming science concepts).

- *Schedule a 5 to 10 minute CR session.* Use short CR lessons for different subjects throughout the school day. Distributed CR practice (e.g., three mini-lessons) is better than one session of massed practice.
- *Prepare your questions and instruction materials* (e.g., Powerpoint® slides, overhead transparencies). Keep CR questions short and require only one correct, one to five word answers (e.g., How many sides does an octagon have?). Short questions and answers increase the number of opportunities to respond and receive teacher feedback.

Conduct Choral Responding

- *Model a question and response for the class.* For example, you say, "I'm going to ask some questions about yesterday's science lesson. If I hold up this paper clip and ask, 'What will a magnet do to this object?' On my signal, you say, attract or not attract." To make your expectations clear, demonstrate several examples and non-examples of correct responding.
- *Present questions clearly and directly.* Avoid long explanations or discussion. Succinct questions maintain students' attention to the lesson content.
- *Allow thinking time.* For difficult questions, have a longer pause between your question and your signal to respond. Hold your hand up with your palm out (as a gesture to "wait") to cue students to get ready to respond on your signal.
- *Use a clear signal.* Clear signals such as a snap, a clap, or simply saying, "everyone" indicate when it is the students' turn to respond. A cue helps students respond in unison, making it easier for the teacher to detect correct and incorrect responses.
- *Give feedback on the group response.* If all students respond correctly, give specific praise and move on to the next question. If most students respond correctly, but a few do not, state the correct answer and return to it later. This will give those students an opportunity to correct their mistake.
- *Call on individual students throughout the lesson.* This allows you to assess low performing students who may have difficulty with the content. If low performers answer correctly, you can be confident that other students are also correct. Use this as an opportunity to reinforce a student's accuracy, not to single out a student for his or her mistakes. Remember to ask your question before calling on a student. This cues students to maintain attention and not "drop out" when it is not their turn.
- *Maintain an energetic pace.* Present the next question immediately after you have given feedback on the previous response. Fast pacing promotes students' participation, accuracy, and decreases off-task behavior.
- *Deliver praise and approval for students' participation and correct responding.* For example, say, "You're so smart!" and give "high fives" throughout the lesson. Your praise and approval can increase students' motivation and make the CR lesson more fun.

Use Choral Responding to Review Concepts

CR serves as an effective review for previously learned concepts (Heward, Courson, & Narayan, 1989). For example, Mr. Remington, a high school history teacher, could use CR to review the day's Civil War lesson. "Okay, class. I'm going to ask a series of questions about what we've covered in today's lesson. Your response will be Confederate or Union."

CR also serves as a "maintenance check" of students' mastery of earlier concepts (Heward, 1994). Mrs. Brown's students with cognitive disabilities learned to identify several community signs (e.g., restroom signs) last week. Mrs. Brown could assess her students' maintenance of this skill through CR. "Great! We haven't done these all week, and you still got it!" Paraprofessionals can also lead small groups of students in a CR review session (Courson & Heward, 1988).

Use Choral Responding to Teach New Skills

CR is not just for reviewing concepts and skills; it can be used to teach new ones (Carnine, Silbert, & Kameenui, 1997). First, identify the steps involved in performing the skill and the prerequisite skills needed to complete the steps. Second, provide fast-paced CR on each step or prerequisite skill. Listen to the students' unison response to assess their accuracy. Praise students' correct responses or provide corrective feedback on errors. Finally, use CR to move through the steps until students are performing the target skill. Figure 1 provides an example of teaching students to use the $>$ and $<$ symbols to compare numbers.

Use Choral Responding Throughout The School Day

Morning Drill

Morning drills (MD) are often used in schools employing a Direct Instruction curriculum (e.g., *Reading Mastery*, *Corrective Reading*, *Connecting Math Concepts*). MD is not a formal Direct Instruction method or curriculum, but shares many features of its teaching approach (e.g., clear signals for student response, in unison group response, corrective feedback and praise, and steady pacing). MD provides structure at the beginning of the school day and serves as a good CR "warm up" of basic academic skills. It also helps students maintain fluency of previously learned skills. MD should be no longer than 10 to 15 minutes each school day. Content from all subject areas can be covered in MD and should progressively and systematically become more challenging throughout the school year. Before students arrive, prepare for MD by setting up content (e.g., math facts) on the chalkboard, dry-erase charts, or overhead transparencies. Examples of MD content include calendar skills, counting in multiples (e.g., 5 to 50, 2-100, 3-30), basic math facts, money skills, telling time, story problems, sight words, words from a "word wall," vocabulary, spelling, sentence punctuation, map skills, and science and social studies facts. MD content should be adjusted to students grade and ability. Present MD just as you would conduct a CR lesson.

Intra-lesson

Interspersing CR within a lesson provides more opportunities for students to respond. Intra-lesson CR also helps teachers assess students' understanding of important concepts before proceeding further in a lesson. Based on students' performance during intra-lesson CR, teachers can determine if review is needed, make adjustments to the lesson, or note which components of the lesson were successful.

Lesson Summary

Using CR as a lesson summary gives students a chance to review new concepts. This is especially important when students are first acquiring a concept or skill and need extra practice to reach mastery (Heward, 1994). CR summaries of critical lesson content also help students prepare for quizzes and tests.

Transitions

Password (Johnson, 1990) is a way to have students actively respond during transition time from one activity to the next or transition to a different classroom or location in the school. With password, the teacher requires each student to answer a question correctly before exiting the classroom (e.g., "Robert, name three of the original U.S. colonies). An advantage of Password is it allows the teacher to adjust the level of difficulty or content for individual students. Although Password does not require whole-group response, it still provides opportunities for active student response.

During transitions, teachers can use CR and adapt Password for groups of students. This is a way to prevent a "mad dash" for the door. For example, Mr. Morgan requires his fourth grade students to choral respond before lining up for lunch, gym, music, and art. "Table one," he says. "Get ready to tell me the name of the land bridge early Americans used to cross from Asia into North America." "Beringia!" they say firmly. "Excellent, table one. Please line up for music class," says Mr. Morgan. "Table two, here's one for you."

Managing elementary students' behavior during transition from the classroom to another part of the school can be difficult. Students typically shove and poke each other, drag their fingers across the walls or lockers, knock on doors, and chat or argue with their peers ("He cut in front of me!") while walking down the hall. Consider CR during these tough transitions. This allows students to "walk and talk" while gaining additional opportunities to actively respond. To avoid disrupting other classrooms, have your students respond quietly, yet loud enough for you to hear.

Have Fun with Choral Responding*Games*

CR is fun for students and teachers, especially when used in a game format. CR games add variety to a typical school day. Using CR games is a good way to end a difficult lesson or a long period of independent seatwork. Figure 2 provides examples of CR games. For more ideas of

games to increase active student response, see Wesson, Wilson, and Higbee-Mandlebaum, (1988).

Variations

When CR becomes a typical classroom routine, you can modify the standard procedures for other CR sessions (Heward, Courson, & Narayan, 1989). For example, you can easily teach students to lead a CR review session. With experience using CR, many students can imitate the teaching procedures, including signals, error correction, and pacing. Model the teaching procedures, let a student present CR questions from a script or poster, and give the student feedback on his or her presentation. Students enjoy leading CR review sessions. The opportunity to lead a CR session often serves as an effective reward for students who are not motivated to participate in large-group activities. Consider using student CR teachers during morning drills or transitions throughout the school day.

CR can be combined with other methods for increasing ASR, such as response cards and guided notes (Heward, 1994). This gives students more opportunities to respond to lesson content and receive feedback. During times when it is necessary to have a quiet classroom (e.g., the class next door is taking a test), replace CR with other easy-to-see hand or finger responses (McKenzie & Henry, 1979). Students can respond by holding up their fingers to match a multiple choice answer (Pratton & Hales, 1986) or show "thumbs up" or "thumbs down" to indicate a response. Younger students can make a "Simon Says" response (e.g., "Touch your ears if the answer is true, touch your nose if the answer is false."). Whichever mode you choose, make sure students can quickly respond in unison and receive immediate feedback on the accuracy of their performance. Enjoy using CR and other variations, and have fun with your students.

* * * * *

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Figure Captions

Figure 1. Using choral responding to teach students to use > and < symbols to compare numbers. Procedure based on Engelmann, Carnine, et al. (1996). Prerequisite skill needed: Identify the larger number in a set of numbers. Teachers can easily include the equal sign in this lesson. Teachers can adjust the number of sets presented and repetitions based on students' performance. Note that no "alligators eat bigger numbers." This statement often just confuses students.

Figure 2. Choral responding games to promote active student response. Teachers can modify these games to fit any grade level.

Figure 1.

Teacher and student script	Number sets on the chalkboard	
	Before	After
Step 1: Identify the bigger number		
Teacher: "I'm going to point to some numbers. When I touch under the numbers, you say which number is bigger." <i>Point under the first set.</i> "Get ready."	8 3	⑧ 3
Students: "Eight"	2 7	2 ⑦
Teacher: "Yes, eight is correct!" <i>Teacher circles the number eight and touches under the next set.</i> "Get ready."	9 10	9 ⑩
Students: "Seven."	7 6	⑦ 6
Teacher: "Way to go! Seven is bigger than two! <i>Teacher circles the number seven.</i>	4 3	④ 3
<i>Repeat for last three sets. Erase numbers and write new number sets.</i>		
Step 2a: State rule about bigger numbers		
Teacher: "Listen to this rule. The big number gets two dots. Say that."	3 6	3 :6
Students: "The big number gets two dots."	5 8	5 :8
Teacher: "Yes, the big number gets two dots. <i>Point under the first set of numbers.</i> "When I touch under the numbers, you say which number is bigger." <i>Point under the first set.</i> "Get ready."	4 1	4: 1
Students: "Six"		
Teacher: "You got it! Six is bigger! So, which number gets two dots?"		
Students: "Six"		
Teacher: <i>Makes two dots next to the six (shown in the after box).</i>		
<i>Repeat for next two number sets.</i>		
Step 2b: State rules about bigger and smaller numbers		
Teacher: "Listen. The big number gets two dots. Say that."	10 5	10: .5
Students: "The big number gets two dots."	0 3	0. :3
Teacher: "Listen. The small number gets only one dot. Say that."	6 4	6: .4
Students: "The small number gets only one dot."		
<i>Repeat until students can firmly say both rules.</i>		
Teacher: <i>Point under the third set of numbers.</i> "Which number is bigger? Get ready."		
Students: "Ten"		
Teacher: Yes, ten. So, which number gets two dots?		
Students: "Ten"		
Teacher: <i>Makes two dots next to the ten.</i>		
"Which number gets only one dot?"		
Students: "Five"		
Teacher: "Super work. Five only gets one dot. <i>Makes one dot next to the five.</i>		
<i>Repeat next two sets. Erase and write new number sets.</i>		

Figure 1. (continued)

Step 3: Draw > and < symbols	Before	After
Repeat Step 2b with new number sets. After the first set, show students how to connect the dots.	4 1	4 > 1
Teacher: "Now I'm going to show you how to connect the dots. Watch me." Draw a line from the higher dot of the bigger number to the single dot of the smaller number, and back to the lower dot of the bigger number. (See after box)	9 3	9 > 3
	8 7	8 > 7
Present the remaining number sets.	0 10	0 < 10
Show examples of correctly drawing lines and examples of incorrectly drawing the lines. Have students CR if you are "right" or "wrong."	4 5	4 < 5
Erased and write new number sets.		
Step 4: Read number sentences with > and < symbols	Before	After
Repeat steps 1-3. After the first number set, show students how to read the number sentence:	8 2	8 > 2
Teacher: Listen. Another word for bigger is greater. What is another word for bigger?	8 10	8 < 10
Students: "Greater."	4 7	4 < 7
Teacher: "Yes, another word for bigger is greater. Way to go!"	3 1	3 > 1
Listen. Another word for smaller is lesser. What is another word for smaller?	6 8	6 < 8
Students: "Lesser"		
Teacher: "You got it! I will read the first number sentence. Watch and listen."		
Teacher: "Eight is greater than two."		
Your turn to read the number sentence.		
Students: "Eight is greater than two."		
Repeat for remaining number sets.		
Write more number sets. Have students CR through all the steps. Call on an individual student at times to assess his or her performance.		

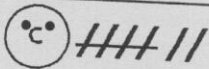
Figure 2.

GAME: Teacher – Student Game (e.g., Engelmann, 1969; Engelmann & Bruner, 1995)

GRADE LEVEL: Lower elementary

DESCRIPTION: The Teacher-Student game can be used in any CR lesson. This game is especially helpful when teaching students how to do CR. Draw a horizontal line on the chalkboard or dry-erase board. Write the word "ME" above the left side of the line. Draw a face (2 eyes, a nose, and no smile) below the left side of the line. Tell students that they earn 1 point each time the whole group answers correctly, and that you earn a point when they are incorrect, or when they do not answer at the same time. Determine how many points are needed to win. Teacher's points are marked next to ME. Students' points are marked next to the face. Begin the CR lesson and award points for each response. Use reminders to set the occasion for students to win, but act as if you are trying to score points. When the students win, call on a student to draw a smile on the face.

ME ///



GAME: CR Simon Says

GRADE LEVEL: Lower elementary

DESCRIPTION: Play this game as you would normally play Simon Says, but add a CR requirement. For example, the teacher says, "Simon says, 'Name the closest planet to the sun,' then touch your head" Students respond "Mercury" and touch their heads. Teacher says, "Spell October and hop on one foot." Several students do not respond, but a few do. Teacher says, "Remember, I didn't say Simon says!"

GAME: Back and Forth Counting

GRADE LEVEL: Elementary

DESCRIPTION: This CR game gives students a lot of practice counting forward, backward, and counting in multiples. The game can be played as teacher vs. students, between two groups of students, or one on one. One team says a number and the other team has to quickly respond by saying the next number in sequence. Each team responds "back and forth" (e.g., Team one "3." Team two, "6," team one, "9" and so forth) until a team makes a mistake. If needed, allow teams to earn points for correct responding.

GAME: CR Hot Potato

GRADE LEVEL: Elementary. Called "Around the World" for older students.

DESCRIPTION: Have students stand and form a large circle. Present fast-paced CR on content that does not require much thinking time (e.g., basic facts). While students respond in unison, have them pass the "hot potato" (i.e., a bean bag or small ball) around the circle. Continue CR and say, "Stop" when the class makes an error. The student holding the bean bag or ball gets "caught holding the hot potato."



Anika had raised her hand for the last time.

Everyone Participates in This Class

Using Response Cards to Increase Active Student Response

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She'd wanted to answer several of her teacher's questions, especially the one about the clouds that look like wispy spun cotton. She had not been called on once, even though she had volunteered several times. Anika tried to follow along, but after awhile she lost interest and hid her head on her desk. Dean did get called on once, but he didn't raise his hand too often. It was much easier to just sit there. He thought if he could just be quiet and still like Anika, then he wouldn't have to think about hearing all this weather stuff. Then it got too hard to just sit and be quiet, so Dean found some marbles in his pocket and began to roll them around on his desk. This got his teacher's attention several times.

"Dean, please pay attention."
"Grrr that, Dean!"

"Dean, how do you expect to learn this material for tomorrow's test if you don't pay attention?"

The next day, to no one's surprise, Anika and Dean did poorly on the meteorology test. As with other students with long histories of poor school achievement, their teachers sometimes used terms like inattentiveness, slow learner, attention deficit disorder, learning disabilities, and behavioral disorder to "explain" Anika and Dean's lack of academic success. But another explanation for the two students' poor test scores is also possible. Perhaps their low scores—as well as their chronic underachievement in school—were directly influenced by the instruction they typically received.

Neither Anika nor Dean had had an opportunity to actively participate in the previous day's lesson. Instead of being active learners making frequent responses to the lesson's content, both students had been, at best, passive observers. Had the teacher designed the lesson to provide every student with frequent opportunities to respond to the content, Anika, Dean, their classmates, and their teacher would all have benefited (see box, "Benefits of Increasing Active Student Response").

Though most teachers recognize the importance of active student participation, it can be difficult to accomplish during group instruction. A common strategy used by teachers to obtain student participation during group instruction is to pose a question or problem to the entire class and then call on one student to answer. This provides an active learning opportunity for only the student who is called on and often results in more frequent responses by high-achieving students and few or no responses by low-achieving students (Mahoney, Malley, Harper & Saca, 1991).

There are several alternatives to the one-student-at-a-time method of student participation. Choral responding—each student in the group or class responding orally in unison—is an easy and proven method for increasing active student responding (ASR) during group instruction (Heward, Courson, & Narayan, 1989; Sahnio, Strain, & Lyon, 1987; Sindelar, Bursuck, & Halle, 1986). Response cards offer another alternative. This article describes several types of response cards and shows how to use them to engage all students in lessons and class discussions.

Using Response Cards

Response cards are cards, signs, or items (such as felt boards) that are simultaneously held up by all students in the class to display their responses to questions or problems presented by the teacher. Not only do response cards enable every student to respond to each question or item, but students can learn by watching others. With response cards, the teacher can easily detect the responses of individual students, which can be difficult with choral responding. Response cards can take many forms, including preprinted and write-on cards.

Preprinted Response Cards

When using preprinted response cards, each student selects from a personal set of cards the one with the answer he or she wishes to display. Examples of preprinted cards include Yes/True and No/False cards, colors, traffic signs, planets, science terms, punctuation marks, and concepts such as cause and effect or before and after (see Photo 1).

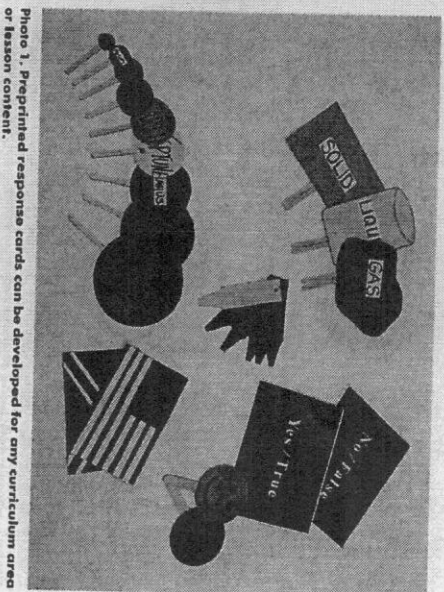


Photo 1. Preprinted response cards can be developed for any curriculum area or lesson content.

Another type of preprinted response card is the "pinch card." Instead of a set of different cards, each student is given a single preprinted card with multiple answers (e.g., a card with clearly marked sections for math operations or the parts of an orchestra). The student simply holds up the card with thumb and forefinger "pinching" the part of the card displaying his or her answer. Brightly colored plastic clothespins and Velcro-backed cutouts or markers (for felt boards) make excellent "pinching" tools; students simply clip the pin or attach the marker to the selected part of the response card and hold the cards overhead (see Photo 2).

Preprinted cards may also have a built-in, movable device for displaying answers, such as a cardboard clock with movable hour and minute hands, or a wheel and a pointer for choosing and displaying answers (e.g., parts of speech). Preprinted response cards have several advantages:

- They produce high rates of ASR.
- Instruction can begin with few errors by beginning with only two cards and adding more cards as students' repertoires develop.
- They are easier for the teacher to see than write-on response cards.
- Possible disadvantages of preprinted response cards:
 - Students are limited to the responses printed on the cards.

- Instruction is limited to recognition tasks.
- They are not appropriate for lessons with a large number of different answers (e.g., 50 states, elements of the periodic table).

Write-on Response Cards

When using write-on response cards, students mark or write their answers to each instructional item on blank cards or boards that are erased between each question-and-answer trial (see Photo 3).

It's easy to make write-on response cards for each student. To obtain a set of 40 durable write-on response cards, purchase a 4- by 8-foot sheet of white laminated "bathroom board" carried by most builders' supply stores or lumberyards. The cost is generally less than \$20, including the charge for cutting the sheet into individual 9- by 12-inch response cards. You can find suitable marking pens at most office and art supply stores. Use "dry erase" markers (one good brand is EXPO) or "China markers." Paper towels or facial tissues will easily wipe clear the dry erase markers. If you use China markers, a bit more "elbow grease" is required to erase answers; old cloth towels work best.

Small chalkboards can be used as write-on response cards, but students' responses may be difficult to see in a full-size classroom.

- Variations in the size and legibility of students' writing can make their responses difficult for the teacher to see.

Evaluating Response Cards

Response cards have been developed and evaluated through an ongoing series of studies in general and special education classrooms. Several of these studies have compared response cards to hand-raising and one-student-at-a-time recitation, the most commonly used method of student participation during whole-class instruction.

For example, Gardner, Heward, and Grossi (1994) compared write-on cards with hand raising during science lessons in an inner-city, fifth-grade classroom. Students responded to teacher-posed questions an average of 21.8 times per 30-minute lesson when response cards were used, but made only 1.5 responses per lesson when the teacher called on individual students to answer. (Look at Figure 1 and think of Student 3 as Anika and Student 4 as Dean.)

The higher participation rate achieved with response cards takes on additive effect significance when its cumulative effect over the course of a 180-day school year is calculated. Based on the results of this study, if response cards were used instead of hand raising for just 30 minutes per day, each student would make more than 3,700 additional academic responses during the school year.

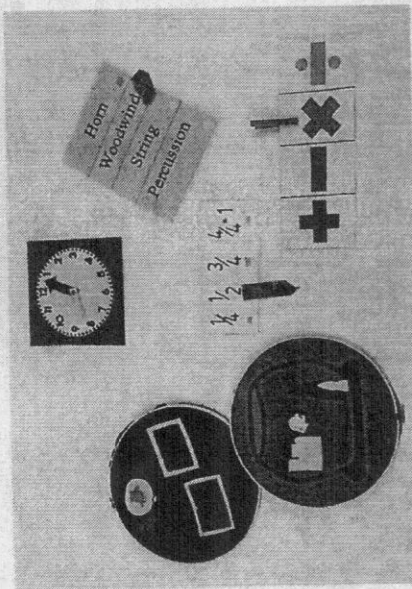


Photo 2. The movable parts on these response cards let students select or create different answers.

- A more demanding recall-type response is required, rather than the simpler recognition-type response used with preprinted response cards.
- Spelling can be incorporated into the lesson. Possible disadvantages of write-on response cards are:
 - Write-on cards have a lower ASR rate compared to preprinted response cards because of the time needed for writing and erasing answers.
 - Error rates are likely to be higher than with preprinted response cards.

Berg (1994) created an effective type of "write-on" response card for teaching relational concepts (e.g., on, beside, after) to preschool children with developmental delays (see Photo 2). In response to teacher-posed directions or questions (e.g., "Put your fish next to the castle"), each child placed a small Velcro-backed marker (e.g., a little yellow fish) on various places within the background scene on his or her felt response card (e.g., a goldfish bowl with a castle and plant inside).

Potential advantages of write-on response cards include:

- Curriculum content and questions for which there are multiple correct answers can be used (e.g., Q: What is an alternative energy source to coal-generated electricity? A: Solar/Nuclear/Geothermal/etc.).
- Students are not limited to predetermined answers and can give creative responses.



Photo 3. With write-on response cards, each student in the class can answer every question the teacher asks about the story the students have just read.

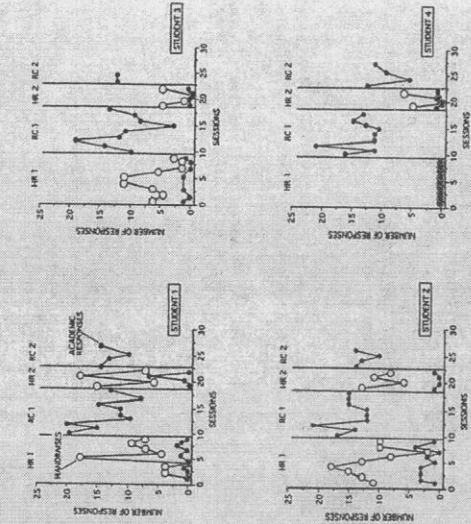
All 22 students in the class scored higher on next-day quizzes and on 2-week review tests following lessons taught with response cards than they did on quizzes and tests covering lessons where students raised their hands to respond. In addition, most of the students preferred response cards and said they were "fun" to use and helped them learn more. This pattern of results—much higher ASR rates, improved test scores, and student preference for response cards—has been replicated in several other studies in elementary, middle, and secondary classrooms (see Heward [1994] for a review).

Suggestions for Using Response Cards in the Classroom

You can adopt and incorporate response-card activities in many ways to best meet your instructional objectives and fit your students' current levels of performance. For example, students might use write-on response cards to display their answers as the teacher demonstrates how to solve a new type of math or geometry problem. During a language arts lesson, students might select and hold up preprinted response cards showing parts of speech (e.g., noun, verb, preposition) as their teacher points to various words in a projected sentence. When the students consistently recognize parts of speech, their teacher can switch to write-on response cards, elevating the lesson to a higher level of knowledge that requires students to recall each part of speech. Response cards might be used during the last 5 minutes of the period in a high school science class to review the day's lesson (Cavanaugh, Heward, & Donelson, 1995).

Response cards are likely to be more effective when used to give students many active responses within a short period of time (e.g., 5 to 10 minutes) than if used for single responses sporadically during the class period. You can combine the use of response cards with other high-ASR strategies to create a learning environment in which students actively participate and receive feedback for those responses throughout the school day or class period. For example, a science teacher at the secondary level might incorporate choral responding, guided

FIGURE 1. Comparison of Four Students' Responses with and Without Response Cards



Note: The four graphs show the number of academic responses to teacher-posed questions and hand raises by four academically at-risk fifth-grade students during whole-class science lessons in which students participated by hand raising (HR) or response cards (RC).

Source: From "Effects of Response Cards on Student Participation and Academic Achievement: A Systematic Replication with Inner-City Students During Whole-Class Instruction" by R. Gardner, H. W. L. Heward, & T. A. Grossi, *Journal of Applied Behavior Analysis*, 1994, Vol. 27, p. 67. Reprinted by permission.

notes, hands-on laboratory activities, response cards, and time trials within a 50-minute class period like this:

- (1) The lesson begins with 3 to 5 minutes' of choral responding in which students "warm-up" for the day's lesson by reviewing concepts they have been learning; (2) students then complete guided notes during a 15-minute lecture or demonstration by the teacher; (3) for the next 20 minutes, small groups of students perform hands-on laboratory experiments, perhaps filling-in a structured worksheet with key procedural results, results, and observations; and (4) on some days response cards are used during the last 5 minutes of the period to review the day's lesson, whereas on other

days the period ends with two 1-minute time trials as a maintenance and fluency-building activity for concepts learned in previous lessons. The actual time spent with each activity would, of course, vary from day to day, and 5 minutes are left unscheduled to allow for transition time. (Heward, 1994, p. 312)

General Suggestions for Using Response Cards

Based on anecdotal observations and the empirical results of the classroom evaluations of response cards conducted to date, we can offer the following suggestions:

- Model several question-and-answer trials, giving students practice on how to use the response cards.

MORE LEARNING

A large and growing body of educational research on the relationship between student participation and academic achievement has made one finding very clear: *Students who respond actively and often to ongoing instruction learn more than students who passively attend.* (For reviews of this research, see Fisher and Berliner (1985) and Greenwood, Delquadri, and Hall (1984)). Active student response (ASR) is a direct measure of student participation in the classroom. ASR occurs each time a student makes an observable response to ongoing instruction.

The kinds of responses that qualify as ASR are as varied as the kinds of lessons that are taught. Depending upon the instructional objective, examples of ASR include words read, problems answered, boards cut, test tubes measured, praise and supportive comments spoken, notes or scales played, student seats, sentences written, workbook questions answered, and last but not least, the basic measure of how much ASR a student receives is a frequency count of the number of academic responses emitted within a given period of instruction. (Heward, 1994, p. 2386)

All things being equal, a high-ASR lesson will produce better achievement than one in which students make few active responses to the lesson's content.

INCREASED ON-TASK BEHAVIOR

Several studies have found increased levels of on-task behavior and reduced off-task or disruptive behavior as correlates or functional outcomes of increased ASR (e.g., Carnine, 1976; Miller, Hall, & Heward, 1995; Sahnou, Strain, & Lyon, 1987). On-task behavior is a weak correlate of learning and should not be the primary goal of any intervention designed to increase achievement. A student can be perfectly on-task yet make no meaningful responses to the lesson. However, increasing the degree to which students pay attention and do not disrupt others during instruction has some important advantages:

- The on-task student is more likely to see and hear important instruction than the student who is off-task or disruptive.
- Peers are better able to see and hear instruction when a student's disruptive behavior is reduced.
- Teachers are pleased when their students are well-behaved and are more likely to use instructional strategies associated with increased on-task behavior.

IMMEDIATE FEEDBACK FOR THE TEACHER

Teachers often check the effectiveness of an ongoing lesson by asking students, "Do you understand?" But the feedback provided by this type of check can be misleading. Students will sometimes answer "Yes" when, in fact, they do not understand. Because:

- "Yes" answers are greeted with smiles and nice words from the teacher, which serve to reinforce saying "Yes."
- They don't want to admit to not understanding when all of their peers are nodding their heads and seem to understand.
- "Yes" answers avoid aversive consequences from the teacher, such as disappointed looks, reprimanding questions, recommendations to "pay better attention" next time, or—worst of all for the whole class—a repeat of the entire demonstration or explanation.
- They don't know they don't understand. Some skills look easy when performed and explained by the teacher, but watching and doing are not the same thing.

When a brave soul does admit to not understanding, the teacher usually probes further to determine what the student does not "understand." This probing can be aversive to both teacher and student, perhaps causing the teacher to avoid asking students (at least that student) if they understand and encouraging students to say they understand whether or not they really do.

These potential problems are avoided when ASR occurs frequently throughout a lesson. ASR provides immediate and ongoing feedback on students' learning, so the teacher never needs to ask, "Do you understand?" The accuracy and fluency with which students respond help the teacher determine what instructional changes, if any, might be made during the lesson itself in an effort to improve the lesson's effectiveness "on the spot."

When instruction includes high-ASR activities, not only is it hard for students to simply passively attend, it is equally difficult for teachers to avoid direct and frequent feedback on the effectiveness of their teaching. Thus, teachers maintain the "close, continual contact with relevant outcome data" they need to make good instructional decisions (Bushell & Baer, 1994).

- Maintain a lively pace throughout the response cards portion of the lesson (i.e., keep the intervals between trials short (Carnine, 1976)).
- Provide clear cues when students are to hold up and put down their cards (e.g., "Cards up," "Cards down").
- Provide feedback based on the "majority response" (Heward et al., 1989). When you see only correct responses, provide a quick and positive comment (e.g., "Great!" "You're right!") and present the next item or question. When you see just a few incorrect responses, state or point out the correct answer (e.g., "Yes, the word 'barn' is the predicate noun in that sentence").
- When a significant number of incorrect responses are displayed—perhaps a fourth or more of the class—state or display the correct answer and immediately repeat the same question or item. Check the effectiveness of corrective feedback by repeating several trials later, any item for which you saw incorrect responses.
- Remember that students can benefit and learn from watching others. Don't let students think it's cheating to look at classmates' response cards.

Specific Suggestions for Using Preprinted Response Cards

- Design and construct the cards to be durable and as easy to see as possible (e.g., consider size, print type, color codes).
 - Make the cards easy for students to manipulate and display (e.g., put answers on both sides of the cards so students can see what they are showing the teacher, attach a group of related cards to a ring).
 - Begin instruction on new content with a small set of fact/concept cards (perhaps only 2), gradually adding additional cards as students' skills improve.
- Specific Suggestions for Using Write-on Response Cards**
- Limit language-based responses to 1 or 2 words.
 - Keep a few extra marking pens on hand, and remind students to cap them

- lightly when the lesson is over.
- Be sure students do not hesitate to respond because they are concerned about making spelling mistakes.
- You might use one or a combination of these strategies: (a) provide several practice trials with new words or terms before the lesson begins; (b) write new words or important technical terms on the chalkboard or an overhead projector and tell students to refer to them as needed during the lesson; or (c) use the "don't worry" technique—tell students to try their best but that misspellings won't be counted against them.
- Students enjoy doodling on their response cards. Let students draw on the cards for a few minutes after a good lesson.

A Final Note

Providing students with frequent opportunities to respond is one of the most powerful means teachers have for increasing academic achievement. Not only are the outcomes of increasing active student responding significant, but the means for providing these opportunities are currently available to the practitioner. Active student responding is neither a hard-to-pin-down hypothetical construct nor a variable such as socioeconomic status, on which the teacher can hope to have little or no effect. ASR is, as Bloom (1980) put it, an "alterable variable"—one that both makes a difference and can be affected by teaching practices. Response cards provide a proven, easy-to-implement, low-cost, and effective strategy for increasing ASR.

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How to Get Your Own Set of Write-On Response Cards

Most big home improvement stores (e.g., Home Depot, Lowe's) carry "shower board" or "panel board," a white laminate material that makes excellent write-on response cards (RC). I recently paid \$12.00 per 4 ft. x 8 ft. sheet at a Home Depot in Columbus, Ohio.

Cutting the sheet into 9 in. by 12 in. pieces will yield 40 RC from one 4 ft. x 8 ft. sheet. (Cutting only 28 9x12 RC from a 4 x 8 sheet will leave a 36 in. x 48 in. piece, which could be used as an easel, to post student performance data, etc.) Ask the person helping you to use the store's panel saw to cut the sheet into 9 in. by 4 ft. strips. These strips can then be stacked four or five together and cut into 9 in. by 12 in. RCs. (Home Depot did the first 6 cuts for free and charged \$.25 for each additional cut.) You may want to smooth the edges of each RC with sandpaper once you get them home. Some teachers put colored plastic tape around the edges to keep them smooth. Total cost for 40 RC should be no more than \$16.00-\$20.00. That's much better than paying \$45.00 to \$79.95 for 12 RC from one of the outfits that sell RC on the Internet.

"Dry erase" markers are recommended because students can easily and quickly, erase their responses with paper napkins or toweling. Old wash rags or socks tied in a knot also make good erasers. Dry erase markers can be obtained at any office supply store (e.g., Staples, OfficeMax) and are about \$.75 each if bought in quantity (one good brand is "EXPO"). Dry erase markers will last a long time if students keep them capped and stored horizontally in their desks. Wax-type "china markers" are less expensive, but responses written with them are harder to erase cleanly. If you know or learn about other good sources, materials, or procedures for making and using response cards, please let me know.

Remember: Keep your students responding!!!

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DESIGNING A LESSON THAT USES CHORAL RESPONDING AND/OR RESPONSE CARDS

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1. *Specify a measurable learning outcome for the lesson.* Specify what a student should know or be able to do after completing the lesson. Stating that students "will know" or "show understanding of" a concept or skill is not a measurable learning outcome. Think about how students will be required use the knowledge and/or skills presented in the lesson at later times. Will they need to identify a class of objects or events when given certain identifying information? Will they be asked to recall specific historical events and/or figures? Will they need to carry out a sequence of steps for a given algebraic operation? After you have decided what you your students need to learn from the lesson, be sure that your CR and/or RC instructional trials provide direct and repeated practice of this objective.

2. *Write scripts for introducing the lesson and for how basic instructional trials will be managed.*

Script what will say to and do with the students at the beginning of the lesson? Include:

- the lesson's purpose (i.e., tell and/or show students what they will learn in the lesson)
- directions and modeling for the CR and/or RC instructional trials. Be sure to give students one or two practice trials with CR and RC

Script how you will manage the CR and/or RC instructional trials. Be specific in describing:

- how you will present the questions, problems, items, scenarios, etc. to students
- length and cues related to thinking pause
- how you will signal students to respond in unison
- how you will give feedback for correct responses
- procedures you will use for correcting errors

3. *Develop a lesson outline.* There is no need to script everything you will say and do for the entire lesson. Create an outline with sufficient detail (e.g., with references to instructional materials such as Powerpoint slides, maps, apparatus, etc. needed for the lesson) to enable you to get everything organized prior to the lesson, and serve as a guide during the lesson so you do not waste valuable time trying to decide/remember what you should do next.
4. *Make or obtain response cards.* Be sure your RC are functional, easy for students to handle, easy for you to see, and reasonably durable. For suggestions on obtaining write-on RC, see the handout: *How to Get Your Own Set of Write-on Response Cards.*
5. *Give your lesson a practice run.* Try your lesson "off-Broadway" before using it with your students. Walking through a new lesson once with a couple of family members or friends as students may identify a glitch or two that can be fixed prior to the lesson's debut. A practice run will also enable you to conduct the lesson more smoothly and fluently in the classroom.

Resources

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Self-Monitoring Helps Students Do More Than Just Be on Task

Self-monitoring is a relatively simple procedure in which a person observes his behavior systematically and records the occurrence or nonoccurrence of a specific behavior. Self-monitoring not only often changes the behavior observed and recorded but also typically changes the behavior in the desired direction.

Self-monitoring has helped students with and without disabilities be on task more often in the classroom (Wood, Murdock, Cronin, Dawson, & Kirby, 1998), decrease talk-outs and aggression (Martella, Leonard, Marchand-Martella, & Agran, 1993), improve their performance in a variety of academic subject areas (Maag, Reid, & DiGangi, 1993; Wolfe, Heron, & Goddard, 2000), and complete homework assignments (Trammel, Schloss, & Alper, 1994). In addition to improving the target behavior, self-monitoring enables students to achieve a form of self-determination by taking responsibility for their learning (Wehmeyer et al., 2000; Wehmeyer & Schalock, 2001).

CAN STUDENTS WITH ADHD SELF-MONITOR THEIR OWN BEHAVIOR?

How can a student who seldom sits still, pays little attention to instruction, and frequently disrupts the class be expected to carefully observe his own behavior and accurately self-record it? Asking a child with ADHD to self-monitor whether he is on task and productive may seem a bit like asking the fox to guard the hen house. How can a student with ADHD pay attention to his own paying attention? Isn't he likely to forget? And if he does remember, what will keep him from recording that he was on task even if he wasn't? Although these are understandable and legitimate questions and concerns, research has shown self-monitoring to be an effective intervention for students diagnosed with ADHD (e.g., Barry & Messer, 2003; Harris, Friedlander, Saddler, Frizzelle, & Graham, 2005; Lo & Cartledge, 2006).


HOW TO GET STARTED









Following are suggestions based on more than 30 years of research on self-monitoring. For a review of principles and strategies for self-monitoring, see Cooper, Heron, and Heward (2007). Detailed procedures and materials for teaching students self-monitoring and other self-management skills are described in Joseph and Konrad (2009) and Rafferty (2010).


1. **Specify the target behavior and performance goals.** In general, students should self-monitor their performance of academic or social tasks (e.g., number of math problems answered, participating in class discussions, transitioning between activities, having materials ready for class) instead of an on-task behavior such as "paying attention." On-task behavior does not necessarily result in a collateral increase in productivity. By contrast, when productivity is increased, improvements in on-task behavior almost always occur as well. However, a student whose persistent off-task and disruptive behaviors create problems for him or others in the classroom may benefit more from self-monitoring on-task behavior, at least initially. Encourage students' participation in selecting and defining the behaviors to be self-monitored and in setting performance goals. Some students will work harder to achieve self-selected goals than teacher-determined goals (Olympia, Sheridan, Jenson, & Andrews, 1994).
2. **Select or create materials that make self-monitoring easy.** Simple paper-and-pencil recording forms, wrist counters, hand-tally counters, and countdown timers can make self-monitoring easy and efficient. Self-recording forms consisting of nothing more than a series of boxes or squares are often effective. At various intervals, the student might write a + or -, circle yes or no, or mark an x through a smiling face or sad face; or record tally marks for the number of target responses made during a just-completed interval. For example, elementary students with ADHD used the form shown on the opposite page to self-monitor whether they worked quietly, evaluated their work, and followed a prescribed sequence for obtaining teacher assistance during independent seat-work activities (Lo & Cartledge, 2006). The form served the dual purpose of reminding the students of the expected behaviors and as a device on which to self-record those behaviors. Countoons are self-monitoring forms that illustrate the target behaviors to be self-monitored and the consequences for meeting the performance contingency (see Figure 6.7) (Daly & Ranalli, 2003). KidTools are free software programs children can use to create charts and tools for self-monitoring and other self-management tasks. KidTools can be downloaded at <http://kidtools.missouri.edu>. Also available at this site are training modules for teachers with video demonstrations and practice materials.
3. **Provide supplementary cues to self-monitor.** Although the self-monitoring device or form itself provides a visual reminder to self-monitor, additional prompts or cues are often helpful. Teachers should provide frequent prompts at the beginning of a self-monitoring intervention and gradually reduce their number as the student becomes accustomed to self-monitoring. Auditory









Date: _____


Work quietly










1. "Am I working quietly?"        










2. Check my work        










3. "Do I need teacher?"      









4. Raise my hand      



5. "How am I Doing?"      



6. Say "thank you"      

THANK YOU

Source: Self-monitoring form from *Functional Assessment and Individualized Intervention Plans: Increasing the Behavioral Adjustment of Urban Learners in General and Special Education Settings* by Y. Lo, 2003. Unpublished doctoral dissertation. Columbus, OH: The Ohio State University. Reprinted by permission.

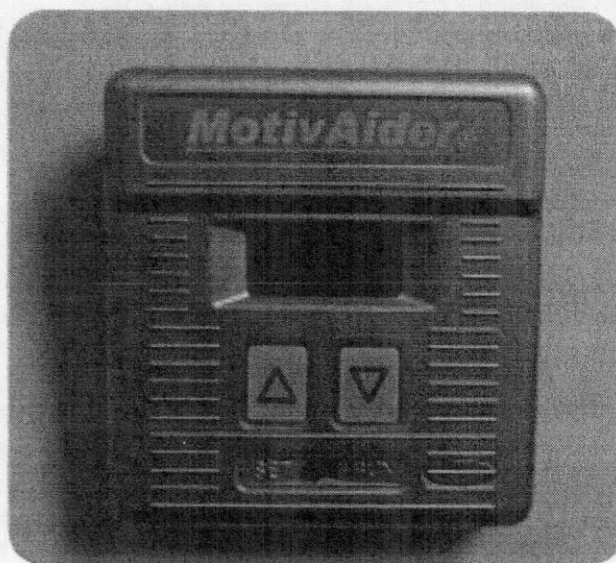
prompts in the form of prerecorded beeps or tones can cue self-monitoring. For example, Todd, Horner, and Sugai (1999) had a student place a check mark next to yes or no under the heading "Was I paying attention?" each time he heard a prerecorded tone that sounded at random intervals.

Tactile prompts can also signal self-recording moments. The MotivAider® (www.habitchange.com) is a small, battery-operated device the user can program to vibrate at fixed or variable time intervals. Flaute, Peterson, Van Norman, Riffle, and Eakins (2005) describe 20 ways for using a MotivAider to improve behavior and productivity in the classroom.

4. **Provide explicit instruction.** Self-monitoring is easy, but don't assume that simply telling the student how to do it will suffice. Model examples and nonexamples

of the target behavior and how and when it should be recorded, provide repeated opportunities to practice, and give praise and corrective feedback.

5. **Reinforce accurate self-monitoring.** Although self-monitoring often positively affects behavior even when inaccurate (e.g., Maag et al., 1993; Marshall, Lloyd, & Hallahan, 1993), accurate self-monitoring is desirable, especially when students use self-recorded data as the basis for self-evaluation or self-administered consequences. One proven method for increasing the accuracy of self-monitoring is rewarding students when their self-recorded data match teacher-collected data for the same period (Rhode, Morgan, & Young, 1983). Check student's data frequently at the beginning of a self-monitoring program, then gradually reduce the number of checks to a random check every now and then.
6. **Reward improvements in the target behavior.** Self-monitoring is often part of an intervention package that includes reinforcement for meeting self- or teacher-selected performance goals (e.g., Olympia et al., 1994). The reinforcer may be self-administered or teacher-delivered (Martella et al., 1993).
7. **Encourage self-evaluation.** Self-evaluation entails comparing one's performance with a predetermined goal or standard (e.g., Grossi & Heward, 1998). Show the student how to self-evaluate and make self-evaluative statements about his behavior (e.g., "That was my best score ever. Excellent!" "I missed my goal by two problems. I'll work harder tomorrow.").
8. **Evaluate the program.** Take some data on the student's behavior for several days before the student begins self-monitoring. Use these data as a baseline against which to compare the data you obtain during the first several sessions of self-monitoring.



The MotivAider can be programmed to vibrate at fixed or variable time intervals. (Courtesy of Behavioral Dynamics, Inc., Developer of MotivAider®.)

Self-Monitoring Helps Students Do More Than Just Be On Task¹

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¹ From W. L. Heward, *Exceptional Children: An Introduction to Special Education* (10th ed.) (pp. 398-399). Copyright © 2013 by Pearson Education, Inc., Upper Saddle River, NJ.

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Motivate Me! 20 Tips for Using a MotivAider® to Improve your Classroom

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Abstract

The MotivAider is a small electronic device that can be set to vibrate at different times to remind people to manage their behavior. This article includes several examples of how the MotivAider can be effectively used in the classroom to manage both student and teacher behaviors.

Keywords

self management, self motivation, motivation techniques

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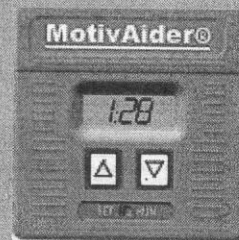
Flaute, A.J., Peterson, S.M., Van Norman, R.K., Riffle, T., & Eakins, A. (2005). Motivate me! 20 tips for using a MotivAider® for improving your classroom. *TEACHING Exceptional Children Plus*, 2(2) Article 3. Retrieved [date] from <http://escholarship.bc.edu/education/teplus/vol2/iss2/art3>

Ms. Foster, a first-year teacher in a classroom for students with severe disabilities, was nervous enough when the school year began, but she's reaching panic mode now. She has learned that a new student will be joining her classroom, Brian, a 14-year-old with a well-earned reputation for engaging in aggression (hitting, kicking, biting, scratching, throwing objects), destructive behavior, cursing, screaming, self-abuse, and non-compliance. Because of these behaviors, Brian comes to her classroom with a behavior management program that forever relies on aversive consequences such as time-out or a two-person seated basket hold for inappropriate behavior. In attempt to curb his problem behavior, the behavior plan also recommended that Brian work in his own study carrel because he is so disruptive to the rest of the class. However, results of a recent functional behavior assessment indicated that Brian's behaviors appeared to be maintained by attention. Ms. Foster believed forcing Brian to work in a study carrel deprived him of the attention he desired. So she removed the study carrel and provided Brian with more frequent positive attention for engaging in appropriate behavior. However, this still did not curb the behaviors; Brian often did not seem to realize he was displaying problem behavior until it was pointed out to him. Ms. Foster needed something else to help manage his behavior, something that would help Brian to become more aware of his problem behavior. That's when Ms. Foster discovered the MotivAider®, a nifty little device for reminding people to manage their behavior.

The MotivAider® was designed approximately 15 years ago by clinical psychologist Steve Levinson to help his clients manage their own behavior more effectively. The MotivAider® is a small battery-operated device about the size of a pager. It weighs less

than three ounces and can be set to vibrate at different intervals (see Figure 1 for a photo).

Figure 1: The MotivAider



Photograph used with permission from www.habitchange.com.

The vibration can be set to last from 1 to 5 seconds as a steady vibration or several short, quick vibrations. It can be set to vibrate as frequently as every few seconds or as infrequently as once in a 24 hour period. The MotivAider® displays the interval countdown on its LCD screen and after it vibrates, starts the countdown cycle over until the device is turned off. If the visual countdown is problematic because the individual using the device keeps looking at it to see how much time is left, it can be changed to show the time of day or a small graphic display. Other features of the MotivAider® include varied magnitudes of the vibration, variable (or average) interval vibrations, fixed (or regular) interval vibrations, and intervals of either seconds, minutes, or hours. Please see Figure 2 for more information about how to purchase a MotivAider®.

Figure 2: How to obtain a MotivAider ®

A MotivAider costs approximately \$60 and can be purchased from www.habitchange.com, by calling 1-800-356-1506 or through email at info@habitchange.com

Although there are many ways to use the MotivAider®, its basic purpose is simple: the vibrations remind people of whatever message that they personally associate with the vibration. The MotivAider® can help keep students focused on a task, reduce “nag-

ging” from a teacher, and eliminate the need for constant reminders to the student to stay engaged. Some examples of how we have used the MotivAider® are listed in Table 1.

Table 1: 20 Ways to use the MotivAider®

Problem	How the MotivAider® Can Help
1. A group of students are having problems staying on-task during reading class or other group lessons.	Set the MotivAider® on a desk. When it randomly vibrates against the desk (it will be loud enough for everyone to hear), all students in reading group who are on-task will receive some sort of established reinforcement, such as a point or a piece of candy.
2. A student does not complete many problems on a worksheet or read enough pages or words in a book.	When the MotivAider® signals at regular intervals, the student counts and self-records the number of problems completed or words read. The student is encouraged to exceed this number by the next interval.
3. Students are sitting too long in an environment where they need to move often, such as during center time activities.	The MotivAider's® vibrations provide a silent reminder to the teacher to change groups or engage students in another activity.
4. One student in the class needs extra reinforcement and attention.	The MotivAider® reminds the teacher to deliver praise or to check on the student's progress at regular intervals, and not when the student is exhibiting undesirable behaviors that demand a teacher's attention.
5. A student is easily frustrated by difficult tasks.	When the MotivAider® signals, the student can take a brief break (which has a set amount of time) from the task. Other schedules and procedures should also be in place so that the student can also earn the break by productive work.
6. A student needs to calm down after becoming upset.	The student is given a predetermined amount of time to calm down without any other person or intervention. Nobody else in the class has to know what that time period is, and it can be a way for the teacher to enforce control over the classroom without being overbearing to students.
7. A student frequently runs out of time during tests.	A student sets the MotivAider® for 10 minutes less than the time allotted for the test. The MotivAider® signals to the student that there are only 10 minutes left. The vibrations can also send regularly spaced reminders throughout the test to keep focused, and give some indication of the time remaining.
8. A student forgets to use a newly learned skill.	When the MotivAider® signals, a message can be associated with the signal to cue the new habit or to practice a new skill, such as remembering to wipe a nose or double-check work.
9. A student forgets when to take medication.	The MotivAider's® signal prompts the student to take medication at a particular time or regular interval by setting it in the morning to the exact number of hours and minutes required.

10. A student is not toilet trained or is on a toileting schedule.	The student can wear the MotivAider® to be reminded to use the restroom, or a staff member can wear it to have a less disruptive reminder to help a student to the restroom. Another way the MotivAider® can be used is to give a student automatic permission to leave class for the restroom without asking when it goes off.
11. A student is easily distracted when writing.	When a person is writing, he or she can set the MotivAider® to vibrate, reminding them to get back to work, focus, and relax.
12. A student bites his or her nails or exhibits other bad habits.	When the MotivAider® signals, the student stops the bad habit if he/she is doing it and records whether or not he/she engaged in the bad habit during the interval.
13. A student needs to self-monitor some behavior.	The MotivAider® provides reminders to record behaviors at regular or variable intervals.
14. A teacher needs to collect data with momentary time sampling or interval duration, but no clock is available and/or a beeper sound is not desirable.	The MotivAider's® vibrations cue the teacher when to observe students and record data.
15. A teacher frequently goes over the time allotted for a lesson.	The MotivAider® can be set to signal the teacher when a specific amount of time remains in the lesson, or at regular intervals to provide proper pacing.
16. A teacher is stressed out.	The MotivAider® can signal the teacher to take deep breaths or to practice brief stress relieving techniques.
17. Staff meetings run too long.	Although the MotivAider® will not stop a person from talking or make the topics more interesting, it can signal meeting coordinators as to how much time has elapsed so that agenda items receive the appropriate amount of time allotment.
18. The timer for a classroom board game has been lost and students need to be reminded of when their turn is over and the game period has ended.	The MotivAider® can be used in many different classroom games to monitor time as determined by the game or indicate the amount of time allotted to play games.
19. A timer is needed for classroom activities.	Place the MotivAider® on a desk or table, and set it to desired time. Vibrations on desk are as loud (or louder!) as a typical beeper timer.
20. A wheelchair-bound student needs to move around on a regular basis.	The MotivAider® can be set at a regular interval (such as every 15 minutes) to remind the student to exercise arms and adjust him or herself in their chair.

More detailed examples of how we have successfully used the MotivAider® to help teachers and children manage their behavior are described in the sidebars in this article. The MotivAider® is not the only tool that can

help manage behavior. Table 2 lists some other tools that may be used in place of the MotivAider® in some cases, but most require someone to reset them at every interval.

Table 2: Other timing devices that can also help to manage behavior

<p><i>Time Tracker Visual Timer & Clock by Learning Resources</i> This is a timer with a red, yellow, and green light on it. It will show visual cues with the lights and can be set with or without a variety of sounds. It is useful to help students with disabilities transition from one class to another.</p>
<p><i>Egg timer or digital timer</i> This is a "regular" timer that can be used for classroom activities. It is also useful if a student needs to go to the office or restroom in a timely manner. If there are two timers, they are both set at the same time and can be clipped to a belt like a pager. The student is to come back to class before the timer goes off.</p>
<p><i>Vibrating timers</i></p>
<p><i>Talking alarm clocks</i></p>
<p><i>Stop watches</i></p>

Case Study A: *Am I sitting? And am I working?*

Jamal was a 3rd grade student in a general education classroom who was referred for behavioral support services by his classroom teacher, Mr. Seduta, for disruptive behaviors (crying, talk outs, out of seat, and playing with objects). Jamal was often off-task during independent work periods, and his schoolwork was inaccurate and incomplete. Mr. Seduta reported that he felt that Jamal was capable of doing better independent work; however, Jamal seemed to expect that answers should be given to his questions without having to put forth any effort himself first.

The intervention designed for Jamal included a self-monitoring intervention using the MotivAider®. The goals of the intervention were to decrease his inappropriate behavior, increase his on-task behavior, and improve his work performance during an independent work period. Two different self-monitoring conditions were implemented based upon a study conducted by Maag, Reid, and Di-Gangi (1993). In all conditions, Jamal wore the MotivAider® on his pants pocket. The MotivAider® was set to vibrate at variable intervals averaging 60 seconds and Jamal recorded some aspect of his behavior whenever the MotivAider® vibrated.

- *Condition #1: On-task/In-seat.* Jamal self-recorded his behavior by asking the following questions: "Am I sitting? And am I working?" If he answered both questions "Yes," then he marked a checkmark on the self-monitoring sheet.
- *Condition #2: Productivity.* Jamal wrote the number of the last problem he had completed when the MotivAider® vibrated on the self-monitoring sheet.

Results were consistent with Maag et al. (1993), in that both self-monitoring of on-task and work productivity resulted in improvements in on-task behavior and decreases in inappropriate behavior. However, self-monitoring of work productivity also resulted in gains in both problems attempted and problems correct. In addition, Jamal indicated that he preferred the productivity monitoring activity over the in-seat/on-task condition.

Suggestions for setting the MotivAider® intervals

The following are some common questions—and answers—that teachers have when using a MotivAider® in a self-management intervention:

How often should I set the MotivAider® to vibrate?

It is best to determine the interval length by considering the behavior you would like to change, how often that behavior currently occurs, and how often you would like the behavior to occur. If the behavior occurs frequently and you want to decrease its occurrence, it is often helpful to count how many times the behavior occurs naturally and then divide the number of minutes you were watching the individual by the number of occurrences. This will allow you to obtain what is referred to as the “mean interresponse time.” For example, if you wanted to decrease Joey’s thumb sucking, you could first observe Joey for several timed observation sessions and count how many times he sucked his thumb. Assume you obtained the information in the chart at the bottom of this page. In this

case, the mean interresponse time is 2.3 minutes, which means that Joey sucks his thumb about once every 2 minutes and 18 seconds. You want to set the MotivAider® to vibrate *more frequently* so the MotivAider® can remind him not to suck his thumb *before* the behavior occurs. So you might set the MotivAider® to vibrate every 2 minutes.

What if the behavior I want to change is not a quick, easy-to-count behavior?

When a behavior you want to change has a longer duration, for example on- or off-task behavior, you should still determine interval length based on the individual’s current level of performance. However, using mean interresponse time as your performance measure is difficult. Instead of using mean interresponse time, keep track of how long the target behavior lasts before you start your intervention. For example, if you want to improve Kaitlyn’s on-task behavior, you could observe her for a period of time and record the duration of on- and off-task behaviors. For example, you could use a recording sheet like the one on the following page.

Date	Instances of thumb sucking	Duration of observation
April 26	15	30 minutes
April 26	10	40 minutes
April 27	5	5 minutes
April 27	17	35 minutes
TOTAL	47	110 minutes
Mean interresponse time = 110 minutes/47 instances = 2.3 minutes		

On/Off Task	Begin Time	End Time	Total Time
On	12:15	12:17	2 minutes
Off	12:17	12:32	15 minutes
On	12:32	12:38	6 minutes
Off	12:38	12:45	7 minutes
On	12:45	12:53	8 minutes
Off	12:53	1:04	11 minutes

Notice that Kaitlyn stays on task for about 2 to 8 minutes (average = 5.3 minutes) at a time. In this case, you might set the MotivAider® for an interval of somewhere around 2 to 5 minutes. You might even consider making the intervals somewhat random, varying from 2 to 8 minutes (averaging about every 5 minutes) so that Kaitlyn cannot predict when she will be checked for on-task behavior.

What if the target behavior is a quick, easy-to-count behavior, but it is a behavior I want to increase, not decrease?

This is the easiest situation. For example, Mrs. Luckey wants to increase the number of times she praises students during reading class. She can simply determine how many times she wants to praise the students over the 45-minute period and set the MotivAider® accordingly. For example, if she wants to deliver praise at least once per minute (or 45 times during the period), she can set the MotivAider® to vibrate every minute. Mrs. Luckey will not necessarily praise at each vibration automatically. She will use the vibration to remind her to catch the next student being good and then praise him or her.

When should I change the interval, and how should I determine what that change should be?

Over time, you may want to increase the time between intervals so that eventually the individual will no longer need the MotivAider's® reminder to maintain his or her behavior. A good rule of thumb is to increase the interval gradually after success has been achieved. If you increase the interval too much, you may no longer achieve the desired results. Think small—think success. If you do make a mistake and increase the interval too much, just return to the last previously successful interval to reestablish success. Then increase the interval by a smaller amount the next time around.

Back to Brian

Let's look at the procedures used in Brian's intervention to illustrate how the MotivAider® can be used to improve behavior. In Brian's case, Ms. Foster determined the appropriate interval for Brian, which initially was 2 minutes, because Brian had difficulty maintaining appropriate behavior for any longer than the 2 minutes. Brian began each day by putting the MotivAider® on his belt and reviewing the class rules in a group meeting with his classmates. Then he selected

a reward to work for that day, which was often one or two gummy bears, or a few potato chips. Brian set his MotivAider® to the designated time interval and activated it. His teacher also wore a MotivAider® that was synchronized with Brian's. When the MotivAider® vibrated, Brian looked at his rule checklist and read through the class rules. After each rule, he circled either a smiley face if he had followed that rule or a frowning face if he had not. His teacher simultaneously filled out a copy of Brian's checklist. Because the functional behavior assessment had indicated that many of Brian's problem behaviors functioned as attention-seeking behaviors, his teacher ignored his problem behaviors during the interval, but she provided him with enthusiastic praise when he engaged in appropriate behavior. During the initial phase of the program, Brian received one token for following all of his rules and another token if his list matched the teacher's list exactly, to encourage accurate self-monitoring. When Brian earned 10 tokens, he could exchange them later for rewards from the class cash-in menu (e.g. soda pop, bottled water, gum) or he could save them to purchase a lunch outing with his teacher. To provide more immediate access to rewards for good behavior, Brian was also given a small reward (the reward he had selected just prior to the session) after each intervention session.

The interval gradually increased after the initial training. Eventually, Brian worked up to monitoring himself only every 10 minutes. After one full week with no problem behavior at 10-minute intervals, the intervals were further increased to 15 minutes, then 20 minutes, and then 30 minutes. As the time intervals grew longer, the tokens were faded by delivering them for only following all the class rules and not for matching the teacher's ratings of his behavior. However, tangible

Case Study B: *Stop Biting Your Nails!*

A third grader, David, was a nail biter. A self-monitoring intervention using the MotivAider® was implemented with David as one component of a habit reversal intervention (Woods, Miltenberger, & Lumley, 1996). David wore the MotivAider® on his waistband; if he was not biting his nails when it vibrated, he clicked a golf counter. At the end of the session, he received a reward for accurate self-monitoring. Initially, the MotivAider® was set at a variable interval of 40 seconds (VI40). When David was successful at this interval, the average interval length was increased in 20-second increments until a 100-second interval was reached. The percentage of intervals in which nail biting occurred decreased from an average of 83% of intervals during baseline to 7% of intervals at VI40, 11% of intervals at VI60, fewer than 1% of intervals at VI80, and 3% of intervals at VI100.

reinforcers were always paired with frequent social praise and high fives.

Before the MotivAider® program was implemented with Brian, he averaged 28 inappropriate vocalizations and instances of noncompliance per day. Throughout the previous school year, Brian had exhibited extremely high rates of aggression (hitting, kicking, biting, scratching, throwing objects), destructive behavior, cursing, screaming, self-abuse, and noncompliance. Eight months after the self-monitoring program with the MotivAider®, Brian did not display any instances of these inappropriate behaviors. He has learned to recognize whether his behavior is appropriate or not and to manage his behavior

effectively. Brian's use of the MotivAider® has been faded over time. In fact, he no longer needs to wear the MotivAider® because he monitors his behaviors only two times each day, once after lunch and again immediately before "cash-in time" at the end of the school day. Ms. Foster, Brian's teacher, happily says, "He has gone months with no disruptive behaviors!" Even more pleasing, with the decrease in disruptive behaviors, an increase in appropriate behaviors has occurred, including Brian's use of appropriate attention-seeking behaviors. For example, he now quietly raises his hand to get his teacher's attention rather than engaging in disruptive behavior, and he is compliant to almost all adult requests. Importantly, as a result of the MotivAider® program, Brian's teacher was able to eliminate the use of an aversive behavior plan that was in place prior to the more positive MotivAider® program. Not only did the MotivAider® help Brian, but it has also helped his teachers and other classmates. The atmosphere in the entire class is so much more conducive for learning.

This is what Brian has to say about his MotivAider®: "I really liked working with (the trainers) and I really like using the MotivAider® and earning money to buy stuff at cash-in time!"

Case Study C: *The MotivAider® at Work for General Classroom Management*

Mrs. Laud wanted to improve her chaotic classroom. Her students were often out of their seats, calling out, and generally unproductive. Mrs. Laud knew that kindergartners needed high rates of positive feedback so that appropriate classroom behaviors could be shaped over time. Thus, Mrs. Laud wanted to increase

her behavior-specific praise to increase her students' on-task behaviors and decrease their call-outs and overall classroom disruptions. However, Mrs. Laud was concerned about her ability to remember to praise students at a rate great enough to make a difference in their behavior. She was also concerned that her classroom assistant seemed to deliver too many reprimands for misbehavior. Mrs. Laud wished her assistant would praise the students who were displaying appropriate behavior instead of consistently attending to their disruptive behavior. She was not confident that just telling the assistant to increase her praise rates would be effective in changing her behavior. This is where the MotivAider® came to the rescue. She referred to her copy of *The Tough Kid Book* by Rhode, Jenson, and Reavis (1992) and used the beeper tape section to create her own intervention in which she incorporated the MotivAider®.

The classroom teacher and her assistant decided to each wear a MotivAider® set on a variable interval 60-second schedule. The teacher's MotivAider® cued her to deliver behavior-specific praise to the students who were participating in her reading lesson, and the classroom assistant's MotivAider® reminded her to deliver behavior-specific praise and tokens (lima beans) to students who were appropriately working on independent seatwork. The beans were placed in a daily reward jar, then transferred to a weekly reward jar, and finally put into a monthly reward jar. When the students reached their monthly goal, the teacher gave the students the choice of a pizza

party, a movie, or free time.

The teacher collected baseline data on her students' behaviors both before and during her praise and token intervention to evaluate the effectiveness of the program and to make decisions about the duration of the interval. When the data indicated a substantial decrease in disruptions and a sizable increase in on-task behavior as compared to baseline data, the teacher and classroom assistant agreed that the extra cue from the MotivAider helped them deliver behavior specific praise, which greatly impacted student performance. The teacher and classroom assistant decided that the 60-second interval was manageable and that changing to a larger interval was not necessary.

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