Topic: Inclusion

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Engaging ADHD students in tasks with hand gestures: a pedagogical possibility for teachers

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How can the use of hand gestures help children with ADHD?
It is estimated that ADHD (Attention-Deficit/Hyperactivity Disorder) (*click to page 3*) affects up to 7% of school-age children. The manifestations of this disorder in the classroom (inattention, impulsiveness and hyperactivity) have an impact not only on the individual child's academic performance, but also their teacher's practice, and - potentially - the learning environment of the entire class.

This study looked at teachers' non-verbal behaviour, examining the difference in impact on 7 year old ADHD children's performance when teachers used speech-only, hand gestures-only, or speech combined with hand gestures to scaffold their learning (*click to page 6*). The study also explored whether using certain types of hand gesture was more effective than others in supporting academic performance.

It found that when hand gestures are used, both alone and together with speech, they are a powerful means of engaging ADHD children and children with other special needs. It also discovered that pointing movements to provide directions and attract attention (deictic gestures) and representational gestures (*click to How are teachers' hand gestures defined? page 7*) were particularly effective in supporting the learning of these children.

Keywords:
USA; Key Stage 2; Primary schools; Pupils; Teachers; Extracurricular activities; Behaviour; Communication skills; Teacher-pupil relationship; Special educational needs; ADHD

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What is ADHD and how does it affect the classroom?

ADHD (Attention-Deficit/Hyperactivity Disorder) is one of the most common childhood psychiatric disorders, affecting an estimated 3-7% of all school-age children. With the three essential characteristics of the condition defined as inattention, impulsiveness and hyperactivity, children with ADHD often:

- can't focus on details;
- are easily distracted;
- talk excessively and frequently interrupt others; and
- have difficulty sustaining attention in tasks and fail to finish them.

Unsurprisingly, pupils with ADHD present challenges for teachers, both in effective behaviour management, and in keeping them focused on the task in hand. Although such treatments and approaches as family education, behaviour therapy/modification, counselling, educational intervention and drugs have been used, the authors suggest that a well-developed pedagogical approach would increase these children's chance of success.

Research has long suggested that hand gestures are effective in the teaching and learning process, and also in helping ADHD children in everyday tasks. The starting point of this study was the authors' postulation that children with ADHD would become more engaged and successful when assisted by teachers' hand gestures.

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What the study found

The effects of the differing forms of support
When the ADHD children's lessons were supported by approaches which involved hand gestures the children were more responsive, focused more on the tasks and were more successful in completing them:

- the children responded three times more to the gesture-only support, and more than seven times more to the combined speech-and-gesture support than they did to the speech-only support;
- while they spent an average of 13 seconds on a task supported by speech alone, this rose to 35 seconds when supported through gestures alone, and 56 seconds with support from both speech and gestures; and
- the success rate of the task was 7% when supported by speech, 31% when supported by gesture and 62% when supported by a combination of the two.

The effect of the *types* of gesture used in scaffolding
Both representational (imitating the shape or motion of an object) and deictic gestures (pointing movements to provide directions and attract attention) (*for full details click to page 7*) had a significant impact on student performance, while other types of gesture did not:

- Both gestures elicited a fairly equivalent degree of student response in both gesture-only and combined speech-and-gesture scaffolding. While both gestures elicited significantly greater response than the others, there was a slightly better response to representational than deictic gestures; both

representational and deictic gestures attracted more of the students' attention and therefore had an (even) greater effect on the *time students spent on tasks* when used in gesture-only scaffolding, than when used in speech-and-gesture scaffolding;
- The students had a 90% *success rate in tasks* supported by these gestures without speech. This was a slightly higher success rate than the 82% success rate achieved when task were supported by these gestures combined with speech.

The authors concluded that the success of these two types of gesture was because:
- representational gestures were more vivid and dynamic than other forms of gesture; their strong relationship to either a shape or action helped students to understand their significance; and
- deictic gestures assisted in attracting students' attention, and providing directions for students to follow.

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What were the aim and the design of this study?
This study had two goals:
- to discover whether teachers' hand gestures benefited the learning of children with ADHD; and, if this were so,
- to determine whether all types of gesture were equally beneficial, or whether some were more useful than others.

The study took place over three years within twelve after-school programmes in three American Midwest towns.
It involved:
- 12 trained male teachers (one from each after school programme), given three weeks' training on what type of support through gesture to use when interacting with the children;
- 45 seven year old boys with ADHD
  - All the participants were boys (because so few girls were referred);
  - 20% were inattentive, 56% were hyperactive and impulsive, and 24% were both. 76% had at least one further disorder, such as conduct disorders or learning disabilities;
  - all were receiving medication while participating in this study. However, to minimise the effect of this, each child was studied just before he took his next scheduled dose.

Each child was observed individually in a controlled task environment. He was asked to solve three sets of Tangram-like puzzles (*for further details click to Where can I find out more? page 8*) with the help of a teacher, in three consecutive sessions over one week. The methods by which the teachers supported the tasks were carefully controlled so that in one session the tasks were supported with speech-only; in one, hand gestures-only; and in the third they were supported with combined speech-and-gestures. The interactions and reactions were videotaped and analysed:
- to determine the differing effects of the three forms of scaffolding, the data were measured in terms of children's responsiveness, attention span and success rate;
- to determine which gestures were most effective, the students' responsiveness, attention span and success rate were rated in terms of each

of the five types of gesture *(for definitions of these, click to page 7)* in both gesture-only and speech-and-gesture scaffolding.

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What support was provided and how was it described in the context this study?

Scaffolding is the term used throughout the original study to describe a teacher/student interaction where the teacher supports the student by providing clues, cues, demonstrations, encouragement, questions etc. We have used the more familiar term support in the earlier pages of this digest.

In this study, the authors concentrated on three previously identified types of scaffolding: speech-only, hand gesture-only, and combined speech and hand gesture.

If a teacher was supporting a student who was doing a puzzle, these scaffolding types would be demonstrated as follows:

- **speech-only scaffolding**
  Teacher: "How about that red piece there? What do you think?"
- **hand gesture-only scaffolding**
  Teacher: points to the corner of a puzzle piece to give a clue to the student but doesn't say anything;
- **combination speech and hand scaffolding**
  Teacher: "Try to replace the triangle with the circle. See what happens." At the same time the teacher points with one hand to the triangular piece while making a circle with the fingers of the other hand.

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How are teachers' hand gestures defined?

Within the concept of hand-gesture scaffolding, research has identified five different types of teacher gestures:

- **deictic gestures** – pointing movements to provide directions and attract attention (eg. the teacher pointing to a puzzle piece);
- **representational gestures** – imitating the shape or motion of an object (eg. the teacher moving her left palm to her right one to indicate putting two objects together);
- **metaphoric gestures** – to demonstrate abstract concepts (eg. the teacher circling an index finger by her temple to indicate 'thinking');
- **emblematic gestures** – conventional gestures recognised by people from the same community or culture (eg. raising a thumb to indicate 'very good'); and
- **beating gestures –** repetitive gestures to emphasise a point (eg. the teacher repeatedly and forcefully moving an index finger in the air to emphasise the importance of what she is saying.)

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What are the implications of the study?

In completing this digest the authors began to ask the following questions about implications for practitioners:

- are teachers and teaching assistants in your school fully aware that something as simple as hand gestures can make a difference to the extent to which children with ADHD and, indeed, other special needs, learn and perform?

- research suggests that many teachers of special needs use only 29% of the range of representational hand gestures when supporting students in the day-to-day classroom. Should teachers be making a conscious effort to use as many hand gestures as possible – and representational and deictic ones in particular – in order to improve their pupils' chances of success?

- would teachers benefit from professional development in this area? For example it may be that the techniques outlined in this study might be effective in scaffolding tasks for older ADHD students, or indeed students without special needs. For these students there could also be a difference in the type of gesture that would provide the greatest support.

For parents there may also be benefits in experimenting with the use of appropriate gestures:

- could the school run a training or consultation evening for parents of children with ADHD?
- could it join together with other local schools in order for potentially small numbers of parents not to feel singled out?
- could parents be invited to join an after school session on the use of gestures fro teachers and teaching assistants?
- is there a newsletter for parents and governors where this research could be flagged or highlighted?

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Where can I find out more?

Complete information on the Tangram puzzles used in this study can be found on www. rexgames.com

Advice on ADHD on Teachernet
www.teachernet.gov.uk/teachingandlearning/library/adhd/

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