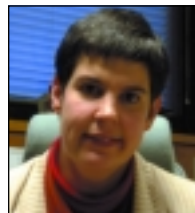


What do you get when you cross a communication aid with a riddle?

ANNE'S speech is difficult to understand. At the age of 10 she has already used several alternative means of communication including manual signs, a symbol chart and a voice-output communication aid – with varying degrees of success. Anne is typical of a child with speech and language impairment: the frustration faced when not understood promotes an avoidance of conversation and can produce a passive communicator, someone more often talked to rather than with.

In an attempt to become a more active communicator Anne took part in a study (Waller *et al.*, 2001) that introduced the idea of narratives and interaction by storing and retrieving her own stories using a computer-based voice-output communication aid. The stories catalogued her day-to-day activities, her likes and dislikes and exciting future events. She could embellish and edit the stored text during a conversation and relate her stories through the voice output at the appropriate place and time, giving the opportunity for her to take a more active part in social chat.

Physical disabilities and motor coordination problems can affect the quality of speech production for many children like Anne (see box). Some may have additional learning difficulties that impede the development of underlying language skills. It is not only speech production that is affected, but also formulating what is to be said. Voice-output communication aids range in their flexibility and size – from a small single message aid the size of an average book to



DAVE O'MARA and ANNALU WALLER on using humour to help language-impaired children to communicate and participate.

a sophisticated piece of equipment similar in size to a laptop computer, with the capacity to store many messages. The messages must be typed into the machine at some stage either for immediate voice and text output for interactive conversation or for storing in larger chunks.

Anne's favourite on her computer was her humour page, containing jokes she had found funny and subsequently stored. Through the voice aid she would tell these jokes to her friends and family. It was not 'the way she told them' that made people laugh but her obvious delight in taking part in a social interaction and being able to introduce a topic and control an audience. Her desire to communicate was encouraged through her success with humour play. She was even practising the rudiments of conversational turntaking skills when she told her 'knock, knock' jokes, as she had to wait for suitable responses from the listener before giving away the punchline!

Complex language skills like turntaking and conversation control are typically practised and developed in a child's language-rich environment. But children like Anne do not have the same opportunity to join in and practise this chit-chat – it is therefore difficult for it to mature, from a seemingly chaotic use heard in the school playground for example, to a more regular structure. Is it fair to give a new voice to children who have had little experience of language play and expect them to converse in a similar way to those who have been practising language skills from the age they could babble?

Children's language use, especially with peers, is often humorous, taking the form of jokes, riddles and silly rhymes. Children with speech difficulties and emerging literacy need to encounter natural sources of language practice – language 'play' through humour provides just such an encounter. Was Anne using her favourite humour page to experience a stage of language development previously denied her? Children with little speech often complain of being invisible. Perhaps we can reveal more about the personality of the communication-aid user through humour and fun interaction. How can verbally expressed humour enhance communication aids, enabling them to move towards more of a language prosthesis than a simple retrieval device?

Verbally expressed humour

*Knock, knock.
Who's there?
Sadie.
Sadie who?
Sadie magic word and I'll tell you!*

Jokes, puns and riddles form a natural part of children's conversation. They provide a structure within which words and sounds are freely experienced – a 'knock, knock' joke, for example, cannot work without both communication partners knowing something about the rules of engagement.

The dual (or more) meaning of some words and pronunciation possibilities of the English language can result in ambiguous

WEBLINKS

The Write:Talk Research Project:

www.computing.dundee.ac.uk/projects/writetalk

Dave O'Mara's homepage:

www.computing.dundee.ac.uk/staff/domara

circumstances. This is a technique often used in verbally expressed humour, especially puns and punning riddles. Laughter (or more often groaning!) results when the ambiguity is resolved. An often-quoted example in the literature comes from the music hall and film comedian W.C. Fields, who when asked 'Do you believe in clubs for children?' replied 'Only when kindness fails'.

Word knowledge and skills such as the ability to switch a frame of reference are required to understand the ambiguity found in much of verbally expressed humour. The appreciation and personal production of humour can aid assimilation of these skills. Personal production leads to greater understanding of the techniques involved, often through feedback from others (joke works = laughter = success), and this can act as a scaffold for emerging language skills.

Telling stories and jokes, talking about common interests and engaging in gossip are some of the ways in which we let others know who we are. Humour plays a role in many social situations. Ever laughed at a rotten joke to avoid hurting the teller's feelings, or simply because everyone else was laughing? Or made a joke to overcome an uncomfortable situation? We use general, light-hearted conversation when we are meeting people for the first time. The more complex side of our personality usually shows itself much later in a relationship! From this information, choices are made about who we would – or would not – like to get to know better.

Effective communication and language development
When using their choice of aid to deal with their basic needs and wants, children can be effective communicators. But more

SPEECH DISORDERS

More opportunity to have fun with language would benefit all children, regardless of their particular speech problem. But the children who would generally gain most are those whose cognitive skills are least affected, and where there is a wide gap between receptive language abilities and expressive abilities. This is commonly seen in children diagnosed with articulation disorders such as *developmental apraxia* and *dysarthria*. The specific language impairment *apraxia* (or *dyspraxia*) describes a difficulty in sequencing and executing the oral movements necessary for speech. *Dysarthria* describes the difficulty in coordinating the speech musculature because of damage to the nervous system – although basic language processes are intact, the mechanical production of speech is impaired.

natural, interactive communication requires a combination of great effort, ability and commitment by the user. This is not surprising: to be able to converse naturally requires knowledge of many complex skills including topic initiation, turntaking, communication breakdown and repair, elaboration and closure.

To avoid frustration, augmented communicators often resort to the simple use of a one-word or short-sentence response. But using short sentences in conversation is not a natural way of expressing personality and may be a barrier to social closeness.

Language-impaired children and adolescents have been found to have significantly poorer understanding of humour than their peers with typical language development (Short *et al.*, 1993; Spector, 1990, 1992). Spector (1990) compared the ability of typically achieving and language-impaired adolescents (between the ages of 14 and 19) to comprehend verbally expressed humour. The language-impaired students scored significantly lower than those with typical development, despite having a mean IQ range similar to the group without language impairment.

It is with the comprehension of humour and the techniques involved that people

with language impairment appear to be at a disadvantage in these studies. However, because language impairment is already present it is difficult to control fully for the influence this may have.

Producing and measuring humour

The regular structures and mechanisms found in much of verbally expressed humour mean that it is possible to facilitate humour through a reasonably high-tech communication aid. Researchers at Edinburgh University have implemented a computer program that generates punning riddles from a general-purpose lexicon (Binsted & Ritchie, 1997). The computer program is an implementation of a formal model of punning riddles. Two kinds of relatively low-level text ambiguity, spelling and word sense, were used. An example of spelling ambiguity humour is:

*What do you call a judge with no fingers?
Justice Thumbs.*

An example of word-sense humour is:

*Why did the man sleep under his bed?
Because he thought he was a little potty.*

Testing with 8- to 11-year-old children revealed that Binsted and Ritchie's Joke Analysis and Production Engine (JAPE) produced significantly more jokes than non-jokes, but was less successful when compared with human-generated material.

They conclude their paper with the observation that the model could work, probably with more success, with a human lexicon (rather than relying on JAPE's inbuilt lexicon). The user would be prompted for word associations that could then be processed as a typical pun using the formal model of how types of punning-like jokes generally work. It is envisaged the communication-aid user could become the lexicon and be encouraged to play with language.

Justice thumbs?

We have explored the area of humour and the possibilities for developing the language skills of children who use augmented communication (O'Mara, 2002). Early work has tried to answer an important first question in reaching the final goal of a voice-aid humour facility: can comprehension of the verbally expressed humour of children of all language abilities be reliably measured?

A number of dependent measures have been used in previous studies on verbal-humour comprehension; all seem to have significant flaws. These flaws become especially relevant when measuring the language and humour skills of children with reduced functional speech. The dependent measures have included requiring the participant to explain the humour in the joke, requiring the participant to choose a funny punchline to a joke, rating whether the participant shows an overt response, and self-rating of the funniness of jokes. A participant with little expressive ability will of course find it difficult to explain how a joke works. The funny punchline method typically requires the participant to choose a punchline from given alternatives. The more words involved, the greater the literacy level and world knowledge required of the individual, which means younger children are at a disadvantage. Also there are differences in a child's sense of humour from that of adults, leading to the possibility of a different, but not necessarily wrong, choice of the researcher's given punchline.

In addition, as many simple jokes are told many times, the participant may be familiar with some of the test material and



How do you make milkshake?

thus be able to choose a correct answer. This does not mean the child has understood the joke. Further, social awareness and pressure may mean many children will laugh or smile (that is show an overt response) when told a joke by a person in authority because they feel it is correct to do so. Finally, a rating of 'funniness' may be an indication that a participant has chosen a joke from a non-joke but reveals little else; it says nothing about comprehension of how the joke works. It may be that the joke appeals on a different level to how it is supposed to: for example, the participant finds something appealing within the structure of the joke such as an absurd image rather than appreciating some later ambiguity.

Because of these problems we devised a new test. The keyword manipulation test reduces the expressive skills needed to register humour comprehension. This is achieved by choosing material containing high-frequency words of which young children should already have experience, and by using a simple task as the dependent variable measure. Comprehension of the stimulus items does not rely on an overt humorous response such as a smile or laugh. Thus social influences of an expected or obliged response are controlled for.

The procedure requires a joke to be presented to the child. An example is the following:

*How do you make milkshake?
You scare it!*

This punning riddle can be altered slightly by changing a keyword (in this case *scare*)

for one of four alternatives given (*stir, frighten, buy, drink*). Only one of the four alternatives provided would retain the underlying structure of the joke – in this case *frighten*. As only one joke and four alternative words are used, memory demand for the emerging or poorer readers is minimal. This is important, as linguistic short-term memory can be a problem for these readers.

Different types of jokes can be presented to the child using this procedure, many of which have keywords semantically very different to the correct alternative. For example, in the joke 'Why did the boy take a hammer to school?' 'Because it was the day they broke up', the correct alternative to *a hammer* is *glue*.

One question has already gone some way to being answered in the early stages of this research – the children's personalities shine through when jokes and riddles are more easily available to them. This is evident even from the limited language-play opportunities offered in this task.

Conclusion

The keyword manipulation test is currently being used to gather data from children of all abilities, which should provide valuable information on the relationship between humour as a language facilitator and conversational skills. Information such as a chronologically delayed comprehension of humour, difficulties with certain types of jokes, and handling ambiguous material, can then be used for the appropriate introduction of wordplay software into voice-output communication aids.

The implications for the child's social and language skills can then be examined by closely studying how the opportunity to play with humour affects communication. Examining issues such as length of voice-aid use, conversation breakdown and repair, who has control of the conversation, and unexpected changes in expressive and social skills will give some insight as to whether the user is moving from 'the invisible' to the 'impossible to ignore'.

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