

Wednesday 4 April 2001

Brain: Kids' got rhythm

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To a three-year-old, the *William Tell Overture* and Chopin's *Funeral March* probably sound equally jolly, a new study suggests. But by the age of about six, children's ability to distinguish happy from sad music is fully formed. Five-year-olds, on the other hand, associate slow tempo with misery, but are not tuned in to the emotional resonance of major and minor keys.

Simone Dalla Bella, of the University of Montreal, and colleagues found that children of five and above correctly matched the structure of synthesized snippets of classical music to mood more than four-fifths of the time.¹

To see which aspects of the music kids were basing their judgements on, the researchers then rearranged the pieces, making slow tunes fast, major tunes minor and vice versa. Some excerpts had key but not tempo altered, others had both qualities changed, and so on.

Generally, children aged between six and eight recognized a change from major to minor as a shift from happy to sad. But five-year-olds based their emotional judgements purely on the music's speed: they thought slow tunes were sadder than fast, but major and minor music sounded equally happy.

As we get older, there seems to be a trend to place less emphasis on tempo as an emotional guide to music.

Three- and four-year-olds were unable to interpret musical emotion ÷ although that doesn't mean they don't have a feel for what makes music music, such as rhythm, scales and harmonies. It's possible that the youngsters were baffled by the complexity of classical music, says Dalla Bella. In an effort to get around this, another member of the same laboratory is testing children's response to music from Disney films.

That children are aware of tempo before they acquire an ear for tone makes sense, says Carol Krumhansl, a psychologist at Cornell University, Ithaca, New York, who studies how we perceive music. "A rhythmic behaviour is rhythmical in nature, such as speech and movement," says Krumhansl.



By six, children appreciate the emotion of classical music

In fact, studies have found that children in their first year are sensitive to changes in tempo. "A decade ago we thought that music was exclusively the result of culture and learning, but now we're coming to think that some appreciation of music might be hardwired," says Dalla Bella.

So will pumping your toddler full of Mozart accelerate his or her musical development? The balance between nature and nurture is unknown, says Dalla Bella. "It's clear that there are individual differences," he says. "But we don't know at what stage exposure could play a developmental role."

Of course, not all cultures write their music in major and minor keys. Indian and Middle Eastern music, for example, is based around different scales from those used in the West. There has been little work on whether the emotional impact of music translates across cultures, says Krumhansl. But what research there is — based on westerners' response to Indian music — suggests that it does. "The emotions in music work at a broad level," she says.

1. Dalla Bella, S., Peretz, I., Rousseau, L. & Gosselin, N. A developmental study of the affective value of tempo and mode in music. *Cognition* (in the press).



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Page updated Friday, July 4, 2003

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