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Bilingualism Gives Children Cognitive Advantage

What is this research about?

Three experiments with six year old children showed that children who speak two languages on a regular basis have higher executive control ability compared to monolingual children. Executive control refers to cognitive processes such as planning, shifting attention and inhibiting distractions. In this study, bilingual children outperformed monolingual children only on tasks that required the use of executive control.

What did the researcher do?

The researcher conducted three experiments that involved six year old monolingual and bilingual children. The children attended the same public schools and lived in a neighbourhood with the same socioeconomic conditions. Across the three studies, there were 151 children divided evenly between monolinguals and bilinguals. In addition to English, the bilingual children spoke one of the following languages fluently: Cantonese, French, Russian, Mandarin, Urdu, Hindi, Vietnamese, Tamil, Arabic, Italian, Hungarian, Gujarati or Japanese. The children were given tests that are used to assess brain functioning and to diagnose learning disabilities. The following standardized tests were administered:

What you need to know:

Bilingual children perform better than monolingual children in tasks that demand executive control. They are able to focus better on a task, in the presence of distractions.

- Peabody Picture Vocabulary Test (PPVT)
- Category Fluency
- Forward and Backward Digit Span
- Trail Making Task (TMT), Trails A and Trails B
- Global-local Task
- Box Completion Task

What did the researcher find?

Monolingual and bilingual children did not differ on the tests involving vocabulary, digit span, verbal fluency and box completion in the first two experiments. In the third experiment monolinguals scored slightly higher than the bilinguals on the vocabulary and memory measures. However, across all three experiments, Bilinguals completed the TMT and global-local tasks more quickly and with greater accuracy than the monolinguals.

The TMT required children to draw a line connecting numbers or letters in a specified

sequence. Symbols were spread across the page and children had to keep their pencil on the page. Trails A involved a simple numerical sequence (connecting 1 to 25). Trails B involved alternating between numbers and letters (ex. 1-A- 2-B-3-C…). This task required executive control because the children had to take multiple steps to complete the task:

- Interpret symbols
- Direct their attention to the relevant symbol
- Ignore other symbols
- Hold a complex rule in mind that requires switching between letters and numbers

Bilingual children performed better in both versions of the TMT. They also outperformed monolingual children in another task that required executive control, the global-local task. In this task, each child was asked to identify either a letter composed of smaller letters (i.e., the global letter) or the smaller letters (i.e., the local letter). This task introduces conflict by using a different letter to create the global letter. Bilinguals identified the correct letter faster than monolinguals, indicating that the bilinguals were able to focus the attention more effectively while ignoring irrelevant information.

This research shows that bilingual children outperform monolingual children on tasks that require a number of executive control processes (e.g., monitoring conflict, updating information, shifting attention). Previous research had limited the bilingual advantage to inhibiting conflicting information. Results also imply that caution must be used when interpreting diagnostic test results for bilingual individuals.

How can you use this research?

This research may be used by practitioners who work with or develop assessments for learning disabilities. Since the TMT is used to test whether a person has learning disabilities such as Attention Deficit Hyperactivity Disorder (ADHD), using standardized norms may not be valid for bilinguals.

About the Researcher

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Keywords

Bilingualism, Executive function, Global–local task, Trail-making task, Inhibition

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