



How Kids Develop Multitasking Ability

The multitasking ability, the capacity to arrange multiple tasks efficiently is important in everyday life. Everyday examples include domestic scenarios like cooking a meal or work settings like running a hotel. This ability is associated with the executive control and is supported by the prefrontal cortex that continuously develops from childhood to adolescence. However, how multitasking skills typically develop across childhood remains unknown.

In order to bridge such a knowledge gap, a group of researchers led by Raymond CHAN at the CAS Institute of Psychology and their international collaborators have investigated the developmental trajectory of multitasking ability across childhood. Sixty-five typically developing children aged 7, 9 and 11 completed two multitasking tests across three time points within a year. The Six Element Test for Children (C-SET) requires children to attempt six subtasks without breaking a specific rule in 10 minutes. The overall multitasking performance, the number of tasks attempted and the rule breaking behavior are recorded. The Battersea Multitask Paradigm (BMP) task involves strategic arrangement and tackle of three subtasks varied in priority and them in 10 minutes. Compared to C-SET, BMP is cognitively more demanding, and allows measurement of different aspects of multitasking ability, including rule learning, planning, plan adherence, monitoring and memory of rules.

As a result, children aged 7 to 12 had demonstrated continuous and linear development of multitasking ability. Children as young as 7 years old were able to understand the requirements of multitasking scenarios well and arrange time for some of the required tasks. As children grew older, they attempted more tasks and most children attempted the majority of the required tasks by age 8. Children at age 9 could easily remember

the content and sequence of the tasks that they had just performed several minutes ago. At age 11, the developmental pace of basic multitasking ability slowed down, whereas more sophisticated multitasking ability continued to show linear growth. By the age of 12, children were adept in managing multiple tasks of equal importance, whereas they were still inadequate and unsophisticated in strategically prioritizing and switching between multiple tasks with varied values.

The developmental trajectories of cognitive components underlying multitasking also varied. Specifically, retrospective memory showed a similar linear development as multitasking ability, indicating its facilitating role. The planning ability for complex multitasking scenarios developed slowly across age 7 to 11, suggesting that it may stand as a bottleneck for development of overall multitasking ability in the examined age range; but it also has a potential to be a driving force for further development. The capacity to follow plans developed slowly from the age 7 to 11, but it benefited from repeated testing in all age groups, indicating that practice and familiarity with the multitasking scenario may help improve plan adherence.

Overall, these findings not only depict the developmental trajectory of multitasking and its associated cognitive functions in children aged 7 to 12, but also reveal the age-specific characteristics of multitasking ability. They provide useful information for the development of targeted cognitive training for typically as well as atypically developing children.

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