

The Effects of WhatsApp Usage on Working Memory Performance among Youth Aged 12-17 / Avi Zion

Abstract

Interpersonal communication using cellular media has become an integral part of the everyday life of many pupils around the world. Several problems have risen in the wake of intensive and unregulated use of cellular communication in terms of time and place, among them the extensive use of text messages. It created an expectation for permanent availability and immediate response at any given time and place. This situation may impair the pupil's functioning in the performance of cognitive tasks in general, and in working memory in particular. Pupils use working memory in a wide variety of tasks, for remembering names, numbers, complex sentences, and working instructions. Impairing these functions may cause considerable learning difficulties. Technological advancement has brought about an increasing media usage, contributing to a way of life that is based on multi-tasking and continuous partial attention. Young people today believe that they have the capacity for simultaneous multi-tasking.

The present study examined the performance of the working memory system in pupils aged 12-17 in a setting of multi-tasking under distractions in the form of incoming text messages. The study confirms and augments the claims of previous studies regarding the negative effect of distractions caused by mobile media, and particularly by smartphones, on the cognitive performance of school children and university students both in class and in preparing school assignments at home. The present study expands and deepens the existing knowledge in this field and provides an understanding of pupils' habits of using smartphones and their ways of coping with distractions in the learning process. The findings of this study should help pupils, parents, and education professionals, contributing to heightened awareness and the development of new educational models which would drive the educational system towards an inevitable technological future.

Research Questions

- (1) What would be the effect of distraction by text messages on the results of working memory tests?
- (2) Would pupils be able to assess the task's level of difficulty and their own working memory efficiency when they work under distraction by text messages?
- (3) Would the usage habits of youngsters using *WhatsApp* affect the results of working memory tests under distraction by text messages; and would an intensive usage pattern allow for better performance in such tests?

(4) Would there be a positive relation between participants' assessment of their self-efficacy regarding the use of smartphones, and their success in working memory tests with *WhatsApp* distraction?

In addition, the study also examined whether there are gender differences in usage habits and in working memory performance results, with and without *WhatsApp* message distractions.

Method

The study is an experimental research design, based on a convenience sample. The study population consisted of 64 youngsters' aged 12-17: 40 girls and 24 boys. The study group and the control group were divided equally in terms of numbers and gender. Both groups took the Working Memory Index of tests included in the Wechsler Intelligence Scale for Children (WISC). The study group took the tests with distractions by text messages using *WhatsApp*; the control group took the tests without distraction and with no mobile phones at hand. In addition, at the end of each test, the pupils filled out a feedback form regarding their experience in terms of difficulty and efficacy, in order to examine the connection between the pupils' experience and their actual performance in memory tests. The pupils also filled out two questionnaires prior to the beginning of the experiment: One questionnaire assessed *WhatsApp* usage habits in order to examine the connection between usage habits and memory performance; the other was a self-efficacy assessment in smartphone use, in order to examine the connection between efficacy assessment and actual working memory performance. Gender characteristics were also examined.

Findings and Conclusions

The study found impaired performance in the experiment group as compared to the control group. Impairment was manifested in each of the working memory tests included in Wechsler Intelligence Scale for Children (WISC). No gender differences were found; that is, both boys and girls experienced a similar decrease in working memory performance when they were in the study group working under distraction by text messages. It was also found that the pupils experienced more difficulty and their work was less efficient in the experiment group. Moreover, a negative relation was found between participants' sense of difficulty and their working memory performance, and a positive relation was found between their sense of efficacy and actual working memory performance. No connection was found between pupils' self-efficacy assessment in using smartphones and their performance on working memory tests. There was no gender difference in working memory function and in coping with distractions during the experiment.

