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LINGUA-2602; No. of Pages 11
ARTICLE IN PRESS

Available online at www.sciencedirect.com

ScienceDirect

Lingua xxx (2018) xxx–xxx

Lingua

www.elsevier.com/locate/lingua

Testing the impact of formal interpreting training on working memory capacity: Evidence from Turkish–English students–interpreters

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Received 16 August 2017; received in revised form 8 April 2018; accepted 8 April 2018

Abstract

The article presents two studies examining the impact of formal interpreting training (FIT) on Working Memory Capacity (WMC) of student–interpreters. In Study 1, we compared the storage and processing WMCs of last-year student–interpreters with the storage and processing WMCs of first-year student–interpreters and last-year Foreign Language Education (FLE) students. In Study 2, we examined the impact of FIT on the WMC of students–interpreters via comparing their results on the WM tasks at the beginning and at the end of their FIT. In both studies, Digit Span Task (DST) and Reading Span Task (RST) were utilized to test storage and processing WMCs. The results of Study 1 revealed that the last-year student–interpreters performed better than the first-year students–interpreters and the last-year FLE students on the RST, but not on the DST. The findings of Study 2 were consistent with Study 1 showing that after FIT, the student–interpreters performed better on the RST but not on the DST. Our findings can be considered as evidence supporting the view that FIT had a beneficial effect not only on the interpreting skills of student–interpreters but also on the central executive and processing capacity of their WM.
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Keywords: Working memory capacity; Formal interpreting training; Students–interpreters; Cross-sectional study; Longitudinal study

1. Introduction

Interpreting is assumed to be a very complex task imposing great demands on interpreters' cognitive resources, as it requires several processes to take place concurrently. To illustrate, during the process of interpretation, when L1 or L2 input is produced continuously, the interpreter has to comprehend it, store the information in his or her memory, switch the source language into the target one, simultaneously translate the input into the target language and produce it, while still being engaged with on-going comprehension of the new input provided by the speaker. Along with all these demands, the process of interpretation may also be challenged by peculiarities of speech rate and manner, content of input, outside distractors, etc. (Setton, 1999). Among the cognitive resources involved during the process of interpretation, special emphasis has been put on working memory (WM), which is a memory system that, according to Baddeley (2003, p. 829), ''facilitates a range of cognitive activities, such as reasoning, learning and comprehension''. WM is considered as a limited

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https://doi.org/10.1016/j.lingua.2018.04.003
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Please cite this article in press as: Ünlü, E.A., Şimşek, Ç.S., Testing the impact of formal interpreting training on working memory capacity: Evidence from Turkish–English students–interpreters. Lingua (2018), https://doi.org/10.1016/j.lingua.2018.04.003

capacity system which supports human thought processes by providing an interface between perception, long-term memory and action (Baddeley, 2003, p. 829). WM resources are assumed to be employed in the process of interpreting to an extreme degree (Osaka, 2002, cited in Mizuno, 2005; Bajo et al., 2000) since ''in order to perform this feat, interpreters must undertake various tasks such as listening and comprehension, information retention, retrieval, production, and monitoring almost concurrently'' (Mizuno, 2005, p. 741). Taking into consideration the high degree of WM use in the process of interpretation, several scholars asserted that in the process of formal interpretation training (FIT) and/or further interpreting experience, interpreters may acquire better cognitive skills, in particular, a better working memory capacity (WMC). With the assumption that training and/or experience in interpreting may enhance WMC, a number of studies were undertaken that specifically aimed at testing the WMC of professional interpreters and/or student–interpreters (Bajo et al., 2000; Christoffels et al., 2006; Liu et al., 2004; Tzou et al., 2012). However so far, the studies investigating this question have not reached a consensus as to whether or not FIT and/or interpreting professional experience have an impact on WMC. While some of them acknowledged that interpreters with formal training and/or professional experience have advantages in WMC when compared with bilingual non-interpreters (Bajo et al., 2000; Christoffels et al., 2006), other studies did not reveal any relation (Liu et al., 2004; Tzou et al., 2012). This article aims to contribute to the debate and presents two studies investigating the impact of FIT on WMC.

In the first cross-sectional study, we compared the WMC of Turkish–English student–interpreters who had gone through FIT at the department of translation and interpreting of a university in Turkey with that of Turkish–English student–teachers who had gone through formal pedagogical training program at a department of Foreign Language Education (FLE) in Turkey. In the second longitudinal study, we investigated whether the WMC of student–interpreters changed after FIT. Relying on the findings of these two studies, we aimed to find out whether FIT might have a beneficial effect on the WMC of students–interpreters. The article is structured as follows: first, general concepts related to WM and the tasks used to measure WMC are introduced; then an overview of studies investigating the relationship between WMC and FIT and/or interpreting experience is presented; this is followed by the reports of our studies, giving information about the participants and describing the methods of data collection and analysis; finally, the results of the research are presented and discussed.

2. Working memory

Research on WM is marked by inconsistent usage of the term among scholars. While some scholars use the term WM to refer to a system that is independent from the long-term memory (LTM) (e.g. Baddeley, 2007), others suggest that WM together with LTM comprises a single memory system (e.g., Crowder, 1982; Surprenant and Neath, 2008) or that WM is an activated subset of LTM (e.g. Cowan, 1999). Some scholars postulate that WM consists of different subsystems (e.g. Baddeley and Hitch, 1974a,b; Daneman and Tardif, 1987; Shah and Miyake, 1996), while others consider it as unitary (e. g. Anderson et al., 1996; Engle et al., 1992; Kyllonen and Christal, 1990). In this paper, we have adopted the up-dated version of the WM model (Baddeley, 2000, 2012).

The initial version of this model was suggested by Baddeley and Hitch (1974a,b), who envisioned it as including three components: a central executive component and two ''slave'' systems, the phonological loop and the visuospatial sketchpad (Baddeley, 2012, p. 6). The main component is the central executive, which functions like a system that controls attentional processes during learning and/or performance, rather than as a storage system. It is responsible for the control and regulation of cognitive processes (Miyake et al., 2000). Baddeley (1996, 2012) defined four main functions of the central executive: the first is to focus attention, the second is to divide attention between two important targets or stimulus streams, the third is to switch between tasks, and the fourth is to interface with the long-term memory (Baddeley, 2012, p. 14). The ''phonological loop'' is responsible for holding phonological and verbal information, and the ''visuospatial sketchpad'' is responsible for storing visual and spatial information. Later, the WM model was modified: Baddeley (2000, 2012) added a fourth component to it, which he called an episodic buffer. The function of this component is to hold different types of information temporarily, to function as a buffer store between the components of the WM and to link WM to perception and long-term memory (Baddeley, 2012, p. 15). The phonological loop, visuospatial sketchpad and episodic buffer are all considered as slave subsystems in order to underline their passive roles in comparison with the central executive, the controller of the information flow (Baddeley, 2000, 2007).

2.1. Measuring WM

Since WMC comprises two capacities, those of storing and processing information (Baddeley and Hitch, 1974a,b), these two components can be measured separately or in combination. The storage capacity involves holding information in mind and is measured by simple span tasks; the processing component, on the other hand, involves storing and

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