**Malaysian Journal of Social Sciences and Humanities (MJSSH) (e-ISSN : 2504-8562)**
**2023, Volume 8, Issue 7, e002424**
**DOI:** https://doi.org/10.47405/mjssh.v8i7.2424

# Reviewing How Individual Differences in Working Memory Capacity Affect the Ability in Following Instructions

**Mohamad Azhari Bin Abu Bakar[1*], Kartini Abd Ghani[2], Norehan Zulkiply[3]**

[1]Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak, Jalan Datuk Mohammad Musa, 94300 Kota Samarahan, Sarawak, Malaysia.
Email: abmazhari@unimas.my
[2]Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak, Jalan Datuk Mohammad Musa, 94300 Kota Samarahan, Sarawak, Malaysia.
Email: gkartini@unimas.my
[3]Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak, Jalan Datuk Mohammad Musa, 94300 Kota Samarahan, Sarawak, Malaysia.
Email: znorehan@unimas.my

**CORRESPONDING AUTHOR (*):**
Mohamad Azhari Bin Abu Bakar (abmazhari@unimas.my)

**KEYWORDS:**
Individual differences
Working memory capacity
Following instructions

**CITATION:**
Mohamad Azhari Abu Bakar, Kartini Abd Ghani, & Norehan Zulkiply. (2023). Reviewing How Individual Differences in Working Memory Capacity Affect the Ability in Following Instructions. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 8*(7), e002424. https://doi.org/10.47405/mjssh.v8i7.2424

**ABSTRACT**

This literature review aims to analyze the role of individual differences in working memory capacity in following instructions based on theoretical perspectives and empirical evidence. Individual differences in working memory capacity have an impact on the encoding, and retrieval stage. In general, the output from the review stated that the performance difference between individuals relates to the experimental design and treatment, which include delivery of the instructions, presentation of objects, the length of instructions, involvement of dual tasks, and retrieval methods. In addition, the contents of instructions can be transferred into working memory space if the individuals can give a high level of attention and control the attention to suppress the distractors. Therefore, the ability to follow instructions depends on the individual's understanding of the instructions' meaning and matching them with the available space of their working memory (capacity). This review also adds value and suggestions to the need to conduct more research on the role of working memory capacity in following instructions.

**Contribution/Originality:** This study is one of the very few studies that have reviewed the role of working memory capacity in following instructions based on individual differences, by referring to the theoretical perspectives and empirical studies. The review also contributes to the need of conducting more studies in this area.

## 1. Introduction

Baddeley and Hitch (1974) defined working memory as a storage system with a limited capacity to manipulate information. The model consists of executive attention, a phonological loop, a visuospatial sketchpad, and an episodic buffer (Baddeley, 2000). Executive attention plays the role of monitoring, selecting, and controlling attention from

distractors. The phonological loop processes verbal information, while the visuospatial sketchpad handles visual and spatial information. Finally, the episodic buffer combines verbal and visuospatial information and links them with information in long-term memory (Baddeley, Allen & Hitch, 2011). Each component of working memory has limited capacity and temporarily stores information (Alloway, Gathercole, & Pickering, 2006). Therefore, individuals must pay great attention to discriminating against distractors to allow information processing in the working memory space.

Cognitive psychology research highlights that working memory works within its limited capacity system. There are individual differences between high and low working memory capacity in processing information (Cantor & Engle, 1993). The research addresses individuals' information processing from attention to retrieval based on task completion, correct and incorrect recalls, and reaction times (Carpenter, 1992; Baddeley, 2010). However, there is a limitation in keeping and attending to all information at one time (Cowan, 2005). Individuals typically are limited in remembering seven items with plus and minus two, and this is labeled as working memory capacity limits (Miller, 1956). Later Cowan (2005) suggested that the capacity limit declined to four items.

Working memory also can be described based on time, space, and energy perspectives. Those elements reflect individual differences in working memory capacity (Cowan, 2005). Cowan (2008) points out an analogy that working memory representations could fade quickly because of limited time. It also has a space limit, which can fit a few items if no appropriate chunking techniques are applied. The energy limit is a resource limit whereby every representation in working memory requires energy and competition between various representations. The one with reliable power will be processed and attended to.

Despite various applications of working memory in different modalities, an important gap in this growing body of research is the limited understanding of the individual differences between high and low working memory capacity in following instructions. Hence, this paper reviews theoretical perspectives and empirical evidence on working memory capacity and following instructions.

## 2. Theoretical Perspectives

This section focuses on reviewing theoretical perspectives underpinning the role of working memory capacity in following instructions. The theories are related to attention, attentional control, cognitive load theory, and following instructions.

### 2.1. Attention

Activation of working memory depends on the individual's ability to give attention. In this context, attention refers to the amount and intensity given to select the information from the sensory stimulus and further be processed in the working memory storage (Fougnie, 2008). Miyake and Shah (1999), mentioned that the relationship between working memory and attention should be referred in the form of systematic mapping. There are differences in attention's taxonomy, such as alerting, orienting, and executive attention. In the alerting state, individuals responded to sensory resources such as what they see and hear. In the orienting state, the information from the perceptual stimulus is transformed into filtering procedures through noise reduction and suppression (Slotnick, Schwarzbach, &Yantis, 2003). In the final state, the executive attention reacts to allow the selected information from the orientation state to get into a limited capacity system which