Faculty of Cognitive Sciences and Human Development

A STUDY ON GENDER DIFFERENCES IN GIVING ROUTE DIRECTION

Miekaella Teicia Mae

Bachelor of Psychology (Honours)

2021

UNIVERSITI MALAYSIA SARAWAK

Grade: _____

Please tick (☐)
Final Year Project Report ☒

Masters ☐

PhD ☐

DECLARATION OF ORIGINAL WORK

This declaration is made on the 11 day of JULY year 2021.

Student's Declaration:

I, MIEKAELLA TEICIA MAE, 64838, FACULTY OF COGNITIVE SCIENCES AND HUMAN DEVELOPMENT hereby declare that the work entitled, A STUDY ON GENDER DIFFERENCES IN GIVING ROUTE DIRECTION is my original work. I have not copied from any other students' work or from any other sources except where due reference or acknowledgement is made explicitly in the text, nor has any part been written for me by another person.

11 JULY 2021 — Miekaella

Date submitted — MIEKAELLA TEICIA MAE (64838)

Supervisor's Declaration:

I, MOHAMAD AZHARI BIN ABU BAKAR hereby certifies that the work entitled, A STUDY ON GENDER DIFFERENCES IN GIVING ROUTE DIRECTION was prepared by the above named student, and was submitted to the FACULTY OF COGNITIVE SCIENCES AND HUMAN DEVELOPMENT as a partial fulfillment for the conferment of BACHELOR OF PSYCHOLOGY (Honours) and the aforementioned work, to the best of my knowledge, is the said student's work

Received for examination by: _____ Date: 11/7/2021

(MOHAMAD AZHARI BIN ABU BAKAR)

I declare this Project/Thesis is classified as (Please tick (√)):

☐ **CONFIDENTIAL** (Contains confidential information under the Official Secret Act 1972)*****
☐ **RESTRICTED** (Contains restricted information as specified by the organisation where research was done)*****
☒ **OPEN ACCESS**

Validation of Project/Thesis

I therefore duly affirmed with free consent and willingness declared that this said Project/Thesis shall be placed officially in the Centre for Academic Information Services with the abide interest and rights as follows:

- This Project/Thesis is the sole legal property of Universiti Malaysia Sarawak (UNIMAS).
- The Centre for Academic Information Services has the lawful right to make copies for the purpose of academic and research only and not for other purpose.
- The Centre for Academic Information Services has the lawful right to digitise the content to for the Local Content Database.
- The Centre for Academic Information Services has the lawful right to make copies of the Project/Thesis for academic exchange between Higher Learning Institute.
- No dispute or any claim shall arise from the student itself neither third party on this Project/Thesis once it becomes sole property of UNIMAS.
- This Project/Thesis or any material, data and information related to it shall not be distributed, published or disclosed to any party by the student except with UNIMAS permission.

Miekaella

11/7/2021 Student's signature _____ Supervisor's signature _____

(11 JULY 2021) (Date)

Current Address: 30, Jalan KP 3/1 Taman Kajang Prima, Kajang Prima 43000, Kajang, Selangor

Notes: ***** If the Project/Thesis is **CONFIDENTIAL** or **RESTRICTED**, please attach together as annexure a letter from the organisation with the period and reasons of confidentiality and restriction.

[The instrument was duly prepared by The Centre for Academic Information Services]

A STUDY ON GENDER DIFFERENCES IN GIVING ROUTE DIRECTION

MIEKAELLA TEICIA MAE

This project was submitted in partial
fulfilment of the requirements for a
Bachelor of Psychology with
Honours

Faculty of Cognitive Sciences and Human Development
UNIVERSITI MALAYSIA SARAWAK
(2021)

The project entitled 'A Study On Gender Differences in Giving Route Direction' was prepared by *Miekaella Teicia Mae* and submitted to the Faculty of Cognitive Sciences and Human Development in partial fulfillment of the requirements for a Bachelor of Psychology with Honours

Received for examination by:

(Mohammad Azhari bin Abu Bakar)

Date:

11/7/2021

Gred

A-

Acknowledgement

I would like to acknowledge and give my warmed thanks to my supervisor Mr Mohamad Azhari bin Abu Bakar who helped me made this work possible. His guidance and advice carried me through all the stages of writing in this study. Without his guidance, I would not be able to produce this study in a streamline manner.

Also, to add on, I would like extend my sincere appreciation to my friends who have been consistently helping me throughout the time I have been a student and constantly able to be reached out when I need help for my final year project. They have been so patient dealing and supporting me throughout this journey.

Other than that, I would like to express my gratitude towards my family for being understanding and supporting me throughout my studies. Their encouragement helped me a lot especially during the hardship times of Covid-19.

Lastly, I would like to give myself a pat on the shoulder for being able to conduct and produce this study despite a stressful pandemic going on right now. Limited social context and self-isolation is not a good mixture for everyone, but I managed myself and I appreciate myself for that.

Thank you.

Contents

List of Tables

List of Figures

Abstract

The main objective of this study is to investigate the gender differences in giving direction. The differences between gender are determined by the usage of left and right turns, the usage of landmarks and the time taken on giving directions. A total of 30 participants consisting of 15 males and 15 females were recruited from University Malaysia Sarawak (UNIMAS). This study used direction-giving task that was inspired by Carol Lawton's study in 'Gender and Regional Differences in Spatial Referent Used in Direction Giving'. Independent-samples ttest was used to test the hypotheses respectfully. Findings from this study showed no significant differences in all three hypotheses tested which are there is a significant difference between gender and the usage of left and right terms, usage of landmarks terms and the time taken to explain route direction. All three hypothesis were tested and all were not supported.

Chapter 1: Introduction

1.0 Introduction

This chapter outlines the background of study, statements of problem, objectives, hypothesis, conceptual framework, definition of terms in the context of this study, and the significance of this study.

1.1 Introduction and Background of Study

Gender differences in cognitive ability have shown profound findings when their spatial skills are tested (Halpern, 2000). Men show better skills involving mental rotation of threedimensional objects, judgement of speed and outperforming women in locating a moving target (Law, Pellegrino & Hunt, 1993). Women show better verbal abilities where they are more communicative resulting in longer explanation due to it (Maccoby & Jacklin, 1974). Lawton (2001), who studied the ways of both men and women in direction giving stated, "research on navigation and way finding shows that men excel on some task while women excel on other tasks" (p. 322). Lawton's conclusion from her studies showed that in linguistic manner, gender differences can be pinpointed relating it to sub-sets of cognitive strengths which was seconded by Jennifer Coates, a sociolinguist. Coates referred this as the 'difference approach' describing how men and women use language (Napoleon, 2007).

Although the existence of data is endless and have similarities, it has yet to integrate into a coherent framework. As mentioned, cognitive ability is comparable by gender especially when verbal and visuospatial is tested (Halpern, 2000). Carrying out studies to compare gander is profoundly better when it is process oriented rather than content oriented and it could contribute into achieving profound findings in gender similarities and differences. To add on to that, it covers a large area that focuses on content skills in which men and women are found to be either different or similar. This can lead to the identification of critical cognitive processes that can be applied and make comparison between genders (Robert & Savoie, 2006).

The purpose of this study is to focus on gender differences in giving route directions similar to Carol Lawton's study on Gender and Regional Differences in Spatial Referents Used in Direction Giving. Lawton's conclusion in her previous study on navigation and wayfinding, claims that the pattern of gender differences that can be detected in her study shows that men excel on some task and women on others. Other similar study entitled A characterization of performance by men and women in a virtual Morris water task: A large and reliable sex difference, studies on both gender's ability in a virtual maze found that males are consistently found to be able to navigate themselves better than females across variety of measures (Astur, Ortiz, & Sutherland, 1998).

The only difference, this study does not include regional differences or uses a virtual Morris water task, however the five characteristics of route that is important for the study left and right turns, landmarks which consist of buildings, topographic features, traffic lights or road signs and the time taken to explain.is grouped in one to show the description of route direction. The overall description of route direction will be evaluated according to the differences in gender.

1.2 Problem Statement

Due to society fixed standards, it is expected to perform in their own associated individual roles. Hence, it should be known that no gender is superior to one another. Relating to studies, gender differences have been one of the factors to study cognitive abilities relating to neuroscience and cognitive science fields. It has been found that spatial skills show more consistency in data for most research (Halpern, 2000).

Current studies analyses route direction (left and right turns) and found that the terminology is used to indicate route perspective or intrinsic method of reference (Levinson, 1996; Taylor & Tversky, 1996). Previous research found that there is no clear pattern of gender differences in using the left/right turns terminology, however, the terms was expected to be more frequently

said by women, given past studies showed reports women prefer a route wayfinding strategy (Lawton, 1994-1996a). With regional differences of chosen route towards the destination, it was predicted that left/right terminology will be used less often in both men and women when the cardinal directions are salient (Lawton, 1994-1996b). According to Dabbs, Chang, Strong, & Milun, R. (1998), there is a negative correlation between cardinal directions and the usage of left/right terminology (p 89-98).

A previous study also found that men use cardinal direction more than women (Parsons, Rizzo, Zaag, McGee, & Buckwalter, 2005). However, another study conducted in Indonesia showed result that women use cardinal direction more often than men (Sing & Kalingga, 2011a). In the same study, it is inconclusive in terms of time taken to give explanation because men use more serial orientation (e.g.: first, second, third, then) instead of full description. To add on to it, the respondents came from different background that surrounds culture, language, education and childhood that may affect their cognitive abilities (Sing & Kalingga, 2011b).

To conclude, most of these studies were conducted in a various country where Americans will use miles instead of kilometers (Lawton, 2001) and Indonesia (Sing & Kalingga, 2011c) where for most, English is not their first language. Hence, data may vary according to the geographical factor of the study.

1.3 Purpose of Studies

The purpose of this quantitative study is to investigate gender differences in giving route directions.

1.4 Objectives

1. To investigate the difference between gender and the usage of left and right terms.
2. To investigate the difference between gender and the usage of landmarks terms.

3. To investigate the differences between gender and the time taken to explain the route directions.

1.5 Research Question

1. Are there any significant differences between gender and the usage of left and right terms?
2. Are there any significant differences between gender and the usage of landmarks terms?
3. Are there any significant differences between gender and the time taken to explain the route directions?

1.6 Research Hypothesis

H1: There is a significant difference between gender and the usage of left and right terms.

H2: There is a significant difference between gender and the usage of landmarks terms.

H3: There is a significant difference between gender and the time taken to explain the route directions.

1.7 Conceptual Framework

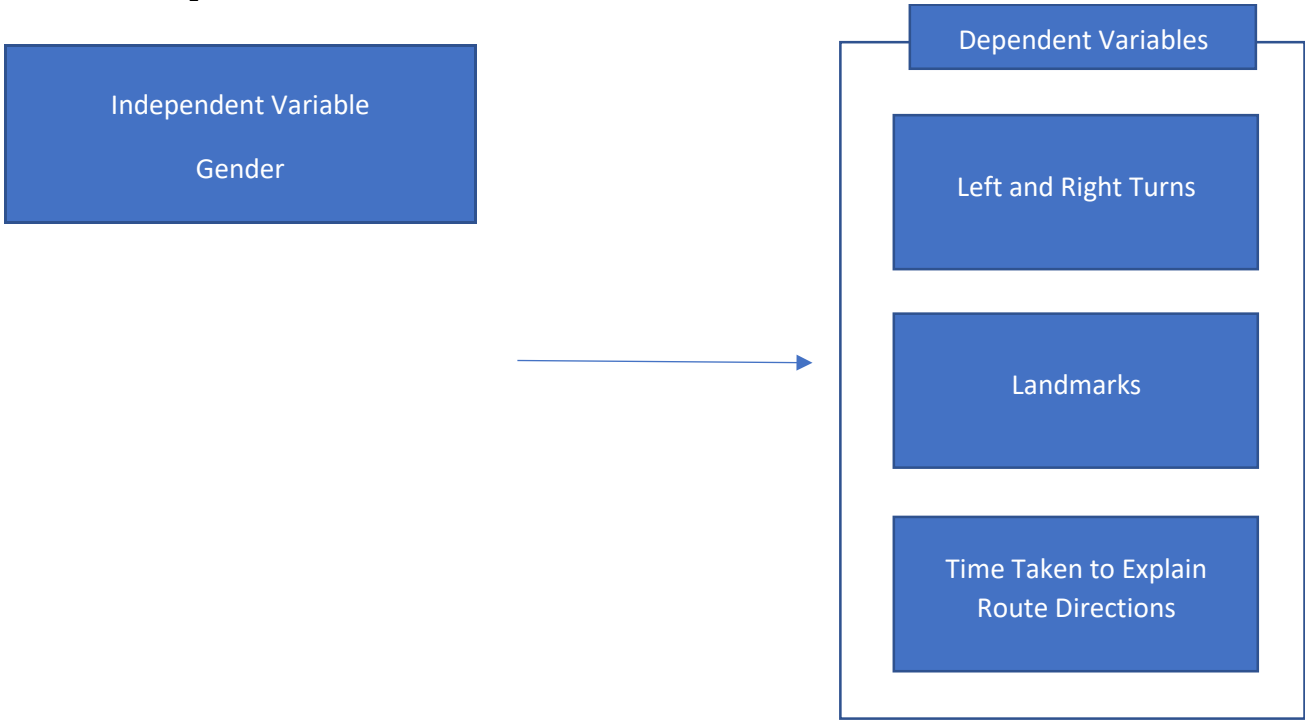

Figure 1.7: Conceptual framework

1.8 Significance of Study

There are many existing studies conducted to investigate the differences of gender in direction giving. However, this study focuses on local participants, which is different than western studies. Due to inconsistency of data in previous study and English being the second language for most Malaysian, cardinal directions will not be applied in this study.

The study aims to expose insights of how direction giving differentiates between gender and how it can relate to cognitive ability. The result of this study will give benefits to people in terms of understanding and pinpointing the difference between gender and their cognitive ability by giving directions.

Besides understanding cognitive ability, this study can also be used to study gender. It can provide some recommendations on how to conduct experiments that involve gender. Hence,

enhancing the understanding of gender that will help researchers in the Humanitarian and Science field.

Lastly, future researchers can use this study as a main reference and guidance to conduct their own study relating to this field for both qualitative and quantitative study. For those who are interested in conducting experimental research design, the methodology from this study can be used as their main reference. Data from this study can also use to be as a secondary data for future researchers in their studies.

1.9 Definition of terms

1. Left and Right Turns

Conceptual Definition: Egocentric coordinates that are geometrical orientation that is related to a human body (Deutscher, 2010).

Operational Definition: The number of times the term left, or right turn have been use according to the gender.

2. Landmarks

Conceptual Definitions: Natural or artificial feature used for navigation that is recognizable (Couclelis, Golledge, Gale, & Tobler, 1987).

Operational Definitions: Landmarks which consist of buildings, topographic features, traffic lights or road signs.

3. Time Taken

Conceptual Definitions: A scalar quantity like length mass and charge which can also be described as fundamental quantity (Considine & Considine, 1988).

Operational Definitions: The amount of time taken to explain route direction.

4. Gender

Conceptual Definition: The biological differences between males and females in terms of chromosomes (female XX, male XY), hormones and reproductive organs (Mcleod, 2014).

Operational Definition: The cognitive ability differences that involves both spatial and literature ability between genders through direction giving.

Chapter 2: Literature Review

2.0 Introduction

This chapter presents the existing literature that studies this research topic. Literature will focus on past studies regarding gender and recalling the map by direction-giving defined and concluded by past researchers. This chapter also describes the concept of Environment of Revolutionary Adaptedness (EEA), cooperative principle and the working memory framework.

2.1 Gender and Spatial Orientation

It has been found that sex and spatial ability go beyond the beginning of humanity. It all comes down to the concept of the Environment of Evolutionary Adaptedness (EEA). For homo sapiens, EEA is thought to consist of a hunter-gatherer theory where humans that lived in groups carried out sexual division of labour where males are primarily hunters while females gather (Tooby & DeVore, 1987). Previous study in 1992, predicts females will be superior to quickly learn and remember the contents of objects arrays and spatial relationship of object. From their experiment, females overall are better at recalling objects that were presented and the location of objects while males are superior at performance. To add on to it, females are 70% better at incidental learning task than males (Silverman & Eals, 1992).

Andrea Bosco, Anna M. Longoni and Tomaso Vecchi (2004) did a study on Gender Effects in Spatial Orientation. The aims of the study were to compare patterns of working memory tasks in men and women. Also, to evaluate gender differences in cognitive profiles. Four different visuospatial working memory tasks and eight orientations were tested on a total of 107 participants. For the first aim, results showed after completing tasks (two route tasks and map completion task) showed a significant difference where the results favour men as good orienteers. To evaluate gender differences in cognitive profiles, specifically visuospatial working memory, it was predicted that men score a higher percentage than women.

A study was conducted using the Morris water test, using computerized three-dimensional graphics. Participants consisting of 20 males and 20 females were told to escape the water as quickly as possible by using a joystick to navigate themselves to safety, which is a hidden platform. It was found that men navigate themselves to the hidden platform faster than females. A second test was conducted with the same participants, this time with a visible platform and it was found that there was no difference between gender and the time to find the platform. The study was concluded with men able to navigate themselves better than women across multiple measures in the experiment (Astur, Ortiz, & Sutherland, 1998).

Previous study assumed that gender differences can only emerge when the task requires a high workload and visuo-spatial working memory. In the same study, they pointed out visuo-spatial working memory is the determinant factor in gender differences especially when spatial orientation ability is involved that indicates men performed better than women solely based on a large visuo-spatial span (Coluccia & Louse, 2004).

2.2 Differences in Referent Used Base on Gender

Cooperative principle describes how people achieve affective conversational communication that is how both speakers and listeners act cooperatively to understand one another. The theory states that it is the description of how people act in conversations (Grice, 1975). The principle is divided into four maxims of conversation that describes specific rational observed by people who follow the principle to achieve effective communication (Benton, 2014). The first maxim is maxim of quality which is trying to make contribution that is true/correct. The second maxim is maxim of quantity, making contribution as informative as required. Third maxim is maxim of relation which is to be relevant to the topic of the conversation. Lastly, the maxim of manner that is described to be perspicuous (Grice, 1975b). Analyzing Grice's study on cooperative principle, it has been strongly suggested that there is an indirect request for driving directions as an effective communicative strategy for speaker to approach a stranger who will be their

direction-givers (Ewald, 2010). In a previous study that investigates typical speech events that is direction-giving and gender, found that both genders use directional indicators such as landmarks, road signs, time estimation, road names and highways were very similar. However, males include more mileage estimates than females, but their estimation contains more errors (Ewald, 2010b).

In 2001, Carol Lawton did a study where spatial referents used are affected by both gender and regional differences. By using surveys, participants were provided samples of route directions to one targeted destination in their area. The route directions were coded into cardinal direction, mileage, right/left turns and landmarks on which gender differences were expected to be different. Results showed that there are no significant differences in the usage of left/right turns in both genders that supports another study in 1998, where they found no significant trend in this direction (Dabbs, Chang, Strong and Milun, 1998).

Schmitz (1997), however, found that there are significant differences, but it is based on age between preadolescents and adolescents. In terms of cardinal directions, men referred to it more than women that is consistent with the recent findings from Harrell, Bowlby and Hall-Hoffart (2000), where they used a nationwide sample to investigate gender differences in spatial language. For landmark based navigational strategy, results showed that women are more likely to use it more than men. While for men, they are more likely to incorporate an overview perspective of route directions referring to it with cardinal directions. This can be supported by the findings in the study done by Taylor and Tversky (1996) with comparable results.

However, it has been reported that both men and women differ in verbal fluency task according to the type of constraints used. Under phonological constraints, where words must begin with a given letter, women dominate this (Tombaugh, Kozak, & Rees, 1999). Under semantic constraints where words must belong in a category, women surpass men in naming fruits, but

men surpass women in naming animals and vehicle names (Bolla, Gray, Resnick, Galante, & Kawas, 1998).

Based on past study that uses cognitive map shows that participants select, organizes, and relate it to the meaning of the item (Lynch & Hu, 2014). An extension to the study suggested that in order to extend the concept of cognitive map, literature has to be involved to represent both spatial information and meanings the participants endow through literacy (Bjornson, 1981).

2.3 Gender Differences in Cognitive Ability

The term 'Working Memory' has been an interest in the Psychology field for decades and although it has been existing for so long, there are so much to learn about it. Our everyday lives are composed of working memories. Working memory is a cognitive system that stores information temporarily that plays a huge role in decision-making or problem solving (Miyake & Shah, 1999). It is believed to be the synonym to short-term memory, but some theorist believed that, both short-term memory and working memory are two distinct forms of memory due to the ability to manipulate working memory whilst storing (Cowan &Nelson, 2008). Baddeley and Hitch (1974) had introduced the components that make up working memory. The model focuses on a central executive that has 3 components which are phonological loop (articulatory loop and acoustic store), episodic buffer and visuo-spatial sketchpad.

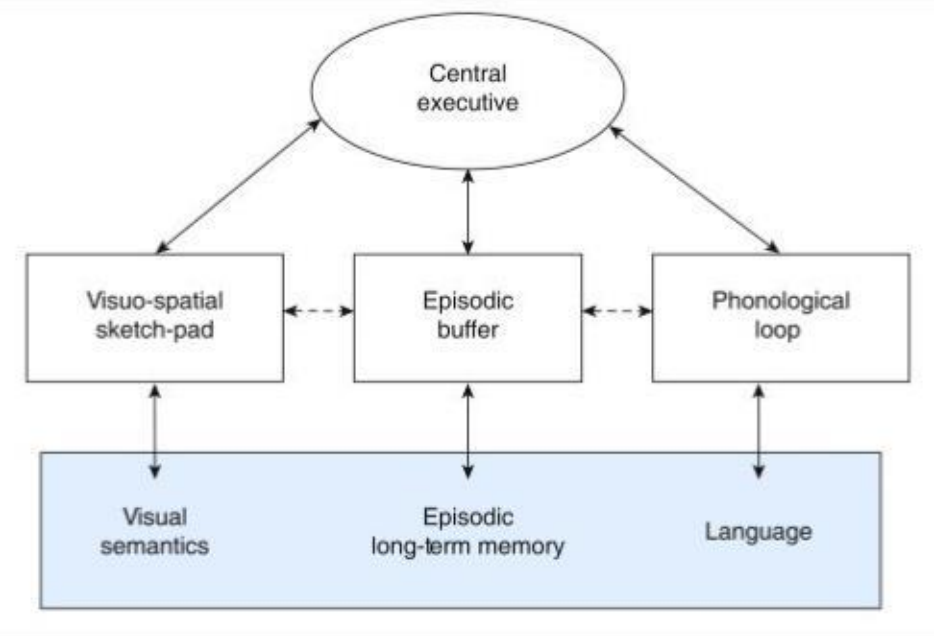

Figure 2.3.1: Working memory model (Baddeley & Hitch, 1974)

Working memory is a complex system that represents and hailed memory, attention, perception, and visuo-spatial ability that lies on the visuo-spatial sketchpad. The regions that are involved for VSWM include the dorsal lateral prefrontal cortex (DLPFC), ventrolateral prefrontal cortex (VLPFC) and supramarginal gyrus (SMG). Adult VSWM circuitry functions for maintaining cognitive control, planning, and preparing responses for visuospatial stimuli while also maintaining it.