



Intelligence Differences Between Genders based on Multiple Intelligence (MI) Theory

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ABSTRACT

Human intelligence differs from person to person. Factors that are associated with intelligence were always an essential theme to discuss and so do the intelligence difference based on gender discrimination. Studying and discussion of the topic were important as it can show a clear view of which gender is worthy for which type of work. So that males and females do not face any physical or mental trouble while finishing their random or given tasks, either at the workplace or at home. In 1983, American psychologist Howard Gardner wrote a treatise titled "Frames of mind: The Theory of Multiple Intelligence" and there he proposed the core eight abilities of an individual from where the term multiple intelligence was born. The eight core abilities are divided into subcategories based on task differences including visual efficiency, organ coordinations, analytical thinking etc. Since then, researchers began to study depending on the theory to find out the intelligence supremacy between male and female. In this study some recent research on multiple intelligence and their results are analyzed briefly to determine whether males or females have better intelligence than the opposite gender. Methodology of the study is divided into two steps. Each step gives an overview of an already done research on multiple intelligence theory where a number of individuals were participated upon whom several tests were given and finally both step research results are merged to reach the study conclusion.

Keywords: Human intelligence, gender differences.

Introduction

Capability of the intellect of a human is known as human intelligence which is made of cognitive ideas and self-awareness. [1] It is declared and proven that humans with higher intellectual and cognitive ideas lead a secure and smooth life comparatively to humans with lower intellectuals. [2] Several factors leave an impact on an individual's IQ (Intelligence quotient), the indicator of intelligence unit. For example, a cold environment increases IQ as it is tough to live in a cold environment. Education, parents' income, and residential areas influence IQ too. [3] The difference of intelligence based on individual person's sex is a debating topic since long ago. Since nature created male and female differently and with not

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similar attributes so a question comes to mind if there's any intelligence difference between the two genders. Also, a major reason of curiosity behind this was either to show gender supremacy or to know who can be suitable for which type of tasks. Several studies and surveys were done in the past where some of the tests denote male have more intelligence than females. Some tests resulted into both genders may have more intelligence than each other based on the types of intelligence (for example: logical- mathematical intelligence, linguistic intelligence, spatial intelligence, musical intelligence etc.). Most of the test results determined that there is actually no intelligence difference between a male and a female but beside that, there were still some tests that showed the intelligence difference, as mentioned before.

Types of intelligence

According to Howard Gardner's "Theory of multiple intelligence (MI)", there are 8 types of intelligence. [4]

1. Spatial intelligence : Visual and spatial judgment. Related to what individuals see while staring around.
2. Kinesthetic intelligence : The intelligence that is applied for physical movement, keeping balance.
3. Musical intelligence : Applied for rhythm and music.
4. Linguistic intelligence : Applied for writing, listening, speaking and language.
5. Logical-mathematical intelligence : Applied for analyzing things and solving mathematical operations.
6. Interpersonal intelligence : Applied to build a strong relationship with others and understanding others.
7. Intrapersonal intelligence : Sensitive to someone's feelings and to own feelings.
8. Naturalistic intelligence : This intelligence creates a close connection and attraction between nature and an individual.

Difference of Multiple Intelligence (MI) between male & female

Several research works were done on multiple intelligence. It is found that males self-esteem their IQ higher than females where the interpersonal intelligence of males are lower than the females.[6] Cognitive research comes up with the information that male and female has different problem solving ability, analysis depth and applications of logic on mathematical tests.[7] The difference of verbal skill between male and female also found and it is seen that females have better linguistic intelligence / verbal skills than males. This study by Marcus also revealed that female students prefer online classes more than male students as their better verbal skills are better and the environment is more secure.[8] The summary of maximum researches based on MI is, since the biological inner and outer structure of male and female differs and also the mental behavior of male and female is seen clearly different than each other so there is high possibility that the intelligence of both genders may vary.

A study result on school going children by two Indian researchers on the children's intelligence difference based on their gender is briefly described below. Notice that, the part of "(a) Spatial intelligence" difference was researched by Team Frontiersin.

Results and Discussion

a) Spatial intelligence: Testing spatial intelligence gives a clear view of an individual's intelligence level. The term "spatial ability" refers to the understanding of the relationship between dimensional static or dynamic objects in space or surroundings. Some researchers from Shaanxi Normal University researched whether there are any differences in spatial ability among the male and female students. The methods were divided into two steps. In the first step, the researchers did the general meta-analysis to find out if there are any spatial differences between males and females. The researchers applied "Activation Likelihood Estimation" to check up the brain activities of both genders to find out the spatial ability fluctuations. The conclusion of the study says that male students outperformed females in both large-scale and small-scale spatial ability (Study 1). Study 2 results showed that both male and female students have similar neural activity and there is no difference in both large-scale and small-scale spatial ability. The major reason why the females have less large-scale spatial ability is they are more sensitive to emotions than males. Following and carrying out egocentric activities is the reason why females lack in small-scale spatial ability. [5]

(b) Linguistic intelligence : Linguistic intelligence is directly related to language abilities including speaking, writing, reading, and listening. No significant differences are found between male and females in writing and learning skills. But females perform better than males when it's about reading skill and the difference is significant.

(c) Logical-mathematical intelligence : This type of intelligence differs gender-wise the most and the differences are quite extensive. Male adolescents have almost two times more score in logical mathematical intelligence than female adolescents. In the case of analytical thinking males outperform females as well. The differences are significant. But the quantitative reasoning and categorization ability is the same in both genders. Which means both males and females rearrange things, add, and subtract in a similar way. Females cannot outperform males in logical-mathematical intelligence.

(d) Musical intelligence : Musical intelligence means the ability to create rhythms and melodies and reactions to music. Male and female do not show any different attributes to music. Both are equally sensitive here. Described statements can be declared as miscellaneous cases as recently musical researchers found out that females are more advanced and engaged than males in fields related to music, composition, arts, literature and considered as more efficient than males. [13]

(e) Naturalist intelligence : Naturalist Intelligence is a type of intelligence which is related to nature, maintaining relationships with animals or pets, doing farm work, gardening etc. No significant differences are found in naturalist intelligence between both genders.

(f) Kinesthetic intelligence : This intelligence denotes movement ability and handling objects which is related with athletes, mechanics, surgeons etc. From the tests it is found that female kinesthetic intelligence surpassed male kinesthetics intelligence. Females tend to be more expressive than males but the restlessness and coordination between the genders do not differ.

(g) Interpersonal intelligence : The ability of understanding people is known as interpersonal intelligence. It is the capacity of understanding and showing endurance to others anger, sadness, moods, intentions etc. Psychologists, managers, heads, captains have this type of intelligence. Tests found out that boys cut a notably better performance than girls and have a significant leadership quality. But here is no significant difference between genders in extrovertism and social nature.

(h) Intrapersonal intelligence : The intelligence of an individual's inner self is called intrapersonal intelligence which is commonly found in counsellors, theologians, self-employed people etc. Males are found as significantly emotionally stronger than females but there is no significant difference in self-esteem and self-indulgence. [9]

Table 01: *Significant multiple intelligence (MI) differences between male and female*

TYPES OF INTELLIGENCE	Male significances	Female significances
Linguistic		
Writing		
Reading		Yes
Learning		
Logical-mathematical		
Quantitative reasoning		
Categorization		
Analytical thinking	Yes	
Musical		
Musicality		
Music integrated learning		
Bodily kinesthetics		
Expressiveness		Yes
Restlessness		
Coordination		
Spatial		
Pictorial efficiency		Yes
Deep insight	Yes	
Artistic talent		

Interpersonal		
Extrovert		
Social nature		
Leadership quality	Yes	
Naturalistic		
Multi-sensory approach		
Eco friendly		
Intrapersonal		
Self-esteem		
Emotional strength	Yes	
Self-indulgent		

Intelligence difference factors

A certain area of the human brain, bilateral lentiform nucleus and bilateral parahippocampal gyrus defines large-scale spatial ability and right sub-gyral, right precuneus, and left middle frontal gyrus defines small-scale spatial ability. It was found that females' parahippocampal gyrus works less efficiently than males, which results in less spatial intelligence. At the same time, the sub-gyral works less efficiently than male sub-gyral, so females lack in small-scale spatial intelligence as well.

About a century ago a hypothesis existed that said that bigger brains have more intelligence. The hypothesis was then studied & tested. A meta-analysis of 37 studies with 1000 individuals showed positive results towards the hypothesis. Another meta-analysis related to the hypothesis with 88 studies and 8000 individuals denoted the correctness of the hypothesis. Hence it was proved that brain size has a significant impact on intelligence and the bigger the brain is, the more intelligence the individual has. [10]

An adult male's brain is about 1370 gm and 1200 gm in female. The volume of a male brain is around 1260 cm³ and in females it is 1130 cm³. So according to the hypothesis it is clear that males have more intelligence than females. [11]

Human brain has two sides: the left side and the right side. Each side functions to accomplish different types of task. For instance- right brained people are turned out as creative, intuitive, sensitive, artistic, rhythmic, imagination-loving etc. where left brained people are turned out as analysis specialist, mathematical problem solver, logical & linear thinkers. Studies found that women tend to use the right side of the brain and men tend to use the left side of the brain. Hence, females outperform males in linguistic intelligence but has outperformed by males in logical-mathematical intelligence. This is also the reason why females have a significant difference in expressions (category of kinesthetics intelligence). [12]

Conclusions

After reviewing all of the research and studies it can be concluded that Males have significantly more large scale and small scale spatial intelligence than females. Females have significantly better linguistic intelligence than males when it is about reading skill. Writing and listening or learning skills show no differences. Logical-mathematical intelligence is a necessary category of intelligence and major differences are found between both genders. Males overcome females in analysis depth and in problem solving, the main sub-category of logical-mathematical intelligence. Arranging, sum up, subtract and other calculation skills show no differences. The studies show that males have a better leadership quality than females and they are emotionally more stable than females. The "Multiple Intelligence (MI)" theory of Howard Gardner detailed every type of intelligence that can be possessed by the human brain and by testing and comparing every intelligence it can be found if an individual has better intelligence than others. Males outperformed females in most of the tests related to multiple intelligence theory. Hence, it is proved that men are more intelligent than women but at the same time, the subcategory tests where women surpassed men, the potentiality and uniqueness of female intelligence should not be neglected.

Competing Interests

The authors declare no conflict of interest.

References

- [1] Tirri, Nokelainen (2011). *Measuring Multiple Intelligences and Moral Sensitivities in Education*. Moral Development and Citizenship Education. Springer. ISBN 978-94-6091-758-5.
- [2] Brown, M.I.; Wai, J. (2021). "Can You Ever Be Too Smart for Your Own Good? Comparing Linear and Nonlinear Effects of Cognitive Ability on Life Outcomes". *Perspectives on Psychological Science*. 16 (6): 1337–1359. doi:10.1177/1745691620964122
- [3] Christopher Epigg, "Why is average IQ higher in some places", (2011). Source: www.scientificamerican.com
- [4] Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New edition, 2011).
- [5] *Gender Differences in Large-Scale and Small-Scale Spatial Ability: A Systematic Review Based on Behavioral and Neuroimaging Research* (2019).
- [6] Bennett, M., Men's and women's self-estimate of intelligence. *Journal of Social Psychology*, 136, 1996, 411-412
- [7] Mnastersky, R., Studies show biological differences in how boys and girls learn about math, but social factors play a big role too. *Chronicle of higher education*, 51(26), 2005.
- [8] Marcus, Scot, *A Comparative Study of Male and Female Online Learner Performance in Secondary Education*, doctoral diss, North Central University, 2015.
- [9] Dr. Mrs. Vandana Punia, Dr. Jiwan Jyoti, *Effect of Gender on Underlying Factors of Multiple Intelligence among School Going Children* (2016), ISBN: 978-93-86171-04-7
- [10] Natalia A. Goriounova, Huibert D. Mansvelder, "Genes, Cells, Brain Areas of intelligence (2019).
- [11] Cosgrove, Kelly P.; Mazure, Carolyn M.; Staley, Julie K. (October 2007). "Evolving Knowledge of Sex Differences in Brain Structure, Function, and Chemistry". *Biological Psychiatry*. 62 (8): 847–855. doi:10.1016/j.biopsych.2007.03.001.
- [12] Medically reviewed by Nancy Hammond, M.D. — Written by Ann Pietrangelo, "Left Brain Vs. Right Brain: What does this mean for me?" (2022)
- [13] Samantha Hissong, "Finally, Research Suggests Female Artists Are More Creative Than Men" (2020).