

## A Study on Gender Differences for Sensory Processing Sensitivity and the Level of Retention & Remembrance of an Event by an Individual

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### ABSTRACT

The study's objective was to find gender differences in sensory processing sensitivity and the level of retention & remembrance of an event by an individual. The study consisted of 32 male and 18 females adding up of 50 individuals. The study was conducted by administrating two scales. First the HSP (Highly sensitive persons) Scale developed by Elaine Aron and Arthur Aron, a video clip from 'Fringe' Series Season 3 Episode 3 was shown, then a questionnaire containing 16 items relevant to the video they witnessed. After two weeks of time interval, the questionnaire contained 16 items was administered with the questions interchanged from the first administered questionnaire that contained relevant items to the video they witnessed. These questionnaires were used to find gender differences for sensory processing sensitivity and, retention and remembrance. The data was analysed using descriptive statistics (Mean and standard deviation). From the study it could be concluded that there was a slight difference between males and females for sensory processing sensitivity and, retention and remembrance of an event by an individual.

**Keywords:** *Gender, Sensory Processing Sensitivity, Retention, and Remembrance.*

Psychology is defined as the scientific study of the mind and behaviour in humans. It is the application of knowledge which aids in understanding one's behaviour based on their surroundings and personality, with that understanding the knowledge is implemented in treating mental disorders with many other applications [1].

Memory is one of the important parts of one's psychology that is responsible for the formation of experiences. Based on experience, one's perception of the said event changes over time that is conditioned by the individual's personality and his/her upbringing and environment. These elements can be broken down into crude components such as memory and sensory processing of any perceived stimulus.

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In the research by Zlotnik and Vansintjan (2019) memory refers to the capability of the brain, that is applied to encode, store and retrieve acquired information [2]. There are three different types of encoding, semantic encoding, visual encoding and acoustic encoding (Spielman et al., n.d.) [3]. The second step is storage, the information that is encoded must be stored somewhere to retain the same in the future. The Atkinson and Shiffrin model starts with the process of sensory memory where the sensory information like sound, taste and texture that arrives from all five senses is stored. The second stage is Short-term memory where the information is stored as chunks. The final step in storage is long-term memory. This type of memory has unlimited storage capacity and duration of retention of encoded information but the downside is if not accessed properly the memory will fade away overtime (Spielman et al., n.d.) [3] and (Mcleod, n.d.) [4].

With respect to criminal justice system one of the significant applications of psychology is the understanding of eyewitness's perception of the event, retention and recall that majorly depend on their memory and its formation. As there are many variables to eyewitness testimony, this study focuses on gender differences in retention and remembrance of the event they witnessed. According to Collins online dictionary (2022), "An eyewitness is a person who was present at an event and can therefore describe it, for example in a law court." [5].

Sensory processing sensitivity (SPS) refers to an individual's ability to perceive and process stimulus and their sensitivity toward such stimulus. It is considered to be a biological and psychological trait (Acevedo, Bianca. 2022) [6]. SPS is divided into two broad categories such High SPS and Low SPS based on the Highly sensitive person (HSP) scale developed by Elaine Aron and Arthur Aron in 1997. The person with High SPS will have characteristics such as withdrawing from stimulating environments and other highly concentrated stimuli, processes sensory and cognitive information more deeply than their counterpart. And the individual with low SPS are less sensitive and have a higher threshold for sensory stimulation (Acevedo, Bianca. 2022) [6].

### **REVIEW OF LITERATURE**

The purpose of this study was to "how sensory processing sensitivity (SPS) is related to personality traits of neuroticism, extraversion, and openness and subjective health complaints (SHC)". The study was conducted by Grimen and Diseth (2016), 167 undergraduate psychology students participated consisting of 28 males and 139 females. Like other studies, this research also found the association between EOE, LST and neuroticism and the association between AES and Openness. Another correlation is EOE and LST were negatively correlated with Extroversion. The correlation between EOE, LST and Subjective health complaints was found to be positive (Grimen & Diseth, 2016) [7].

The objective of this review article was "What does it mean to Be Sensitive? Serotonin, Stress, and the Highly Sensitive Person (HSP)" by Alessandra Suuberg is to associate HSP, Serotonin and stress. In this review, though Sensory processing sensitivity (SPS) is thought to be inherited based on biological means, exposure to certain environments in childhood is found also to be responsible for SPS in adults. This poses a debate whether the innate presence of SPS caused the person to perceive such an event as stressful or the event being stressful made the individual sensitive to stimulus. The presence of short 5-HTTLPR (Serotonin Transporter linked polymorphic region) was found to be a factor that influences various psychopathology and social characteristics, and deep processing or improved

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cognition. In some cases, this was found to be the cause of startle response, psychological stress, attentional bias and response to social evaluation. And these were the factors studied in the HSP scale. And some research found that experiencing stressful events might contribute to a highly sensitive personality (Suuberg, 2017) [8].

The purpose of the study was to use the resting-state brain network to predict individual differences associated with depth of processing with an fMRI. The study consists of a group of adults, who were subjected to resting-state brain connectivity using fMRI after they have completed an “empathy” task. SPS was measured using the HSP scale and the results were correlated to rs brain connectivity. The results found that SPS is associated with attention and consolidation of memory. This supports the theories related to “depth of processing” with was the central idea of SPS (Acevedo, 2021) [9].

### **METHODOLOGY**

#### ***Aim***

To find gender differences in sensory processing sensitivity and the level of retention & remembrance of an event by an individual.

#### ***Objectives***

To measure the difference in sensory processing sensitivity and level of retention and remembrance among male and female participants.

#### ***Research Design***

Quasi-Experimental Research

#### ***Definitions***

- *Memory* is defined as the capability of the brain, that is applied to encode, store and retrieve acquired information [2].
- *Sensory processing sensitivity* refers to “the organisation of sensory information from the body and the external world that allows a person to interact effectively with their physical and social environments” [10]

#### ***Hypotheses***

##### **Hypothesis 1:**

H<sub>0</sub> - There are no gender differences in Sensory processing sensitivity.

H<sub>1</sub> - There are gender differences in Sensory processing sensitivity.

##### **Hypothesis 2:**

H<sub>0</sub> - There are no gender differences in the level of retention and remembrance.

H<sub>1</sub> - There are gender differences in the level of retention and remembrance.

#### ***Variables***

- Sensory processing sensitivity.
- Level of retention & remembrance of an event.

#### ***Sampling Technique***

- *Population:* The sample included both male and female populations belonging to the age group of 17 to 22. That comprises of 32 males and 18 females.

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- *Sample size:* The sample size consisted of 50 individuals in phase 1 and phase 2 of the experimentation.
- *Sampling method:* Purposive sampling technique
- *Inclusion criteria:* Individuals within the age range of 17 to 22 years with the knowledge to communicate in English.
- *Exclusion criteria:* Individuals with any mental disorder.

### ***Data Collection Tools***

Highly sensitive person scale (HSP Scale) by Elaine Aron and Arthur Aron in 1997. It is a self-administered instrument consisting of 27 items with a 7-point Likert scale from “Not at all” to “Extremely”. The scale has an internal consistency of 0.87 and validity of 0.85.

A video from ‘Fringe’ Series Season 3 Episode 3 – “The Plateau”, has an overall time of 2 minutes and 16 seconds.

Video-based questionnaire (self-developed). The questionnaire contains 16 items based on the above-presented video; the first 8 items consist of description-based questions where the participants are asked to write the response in their own words. The second 8 items consist of multiple-choice based questions with four options relevant to the questions where one is the correct answer.

### ***Data Analysis***

Descriptive statistics - Mean and Standard deviation.

### ***Ethical Considerations***

The participants were given consent forms and the nature of the experiment was explained to the participants before performing the experiment.

## **DATA ANALYSIS AND DISCUSSION**

The objectives of the study were to identify whether there is gender differences in sensory processing sensitivity, and whether there is gender differences in retention, recall. The sample consisted of 50 students, between the ages of 17 and 22 who were selected using the purposive sampling technique. The experiment consisted of two phases. In phase 1, the HSP Scale was administered on the sample population which was developed by Elaine Aron and Arthur Aron in 1997. It is a self-administered instrument consisting of 27 items with a 7-point Likert scale from “Not at all” to “Extremely”. To assess the level of remembrance and retention among the participants, a video from the ‘Fringe’ Series Season 3 Episode 3 “The Plateau”, which has an overall time of 2 minutes and 16 seconds was shown to the participants. After the video is displayed, a self-developed questionnaire containing eight descriptive and eight multiple-choice questions containing items related to the video were given to participants. In phase 2, after two weeks of time interval the same descriptive and multiple-choice questions with interchanged questions were given to participants via google forms and the responses have been noted.

For hypothesis 1 is to find the presence or absence of gender differences in sensory processing sensitivity using the mean and standard deviation of HSP scale scores.

For hypothesis 2 is to find the presence or absence gender differences in retention and remembrance of events using the mean and standard deviation of video-based questionnaire scores from phase 1 and phase 2.

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The sample size of the study was 50 individuals which consist of 32 male and 18 female participants. On average, the sample population showed a medium level of sensory processing sensitivity and an average level of retention and remembrance. Among the 50 participants, 4 of them had high consistency of retention and recall. With respect to sensory processing sensitivity, 5 participants showed a high level of sensory processing sensitivity and 3 of them showed a low level of sensory processing sensitivity.

### Hypothesis 1:

The study found that there are gender differences in Sensory processing sensitivity.

### Hypothesis 2:

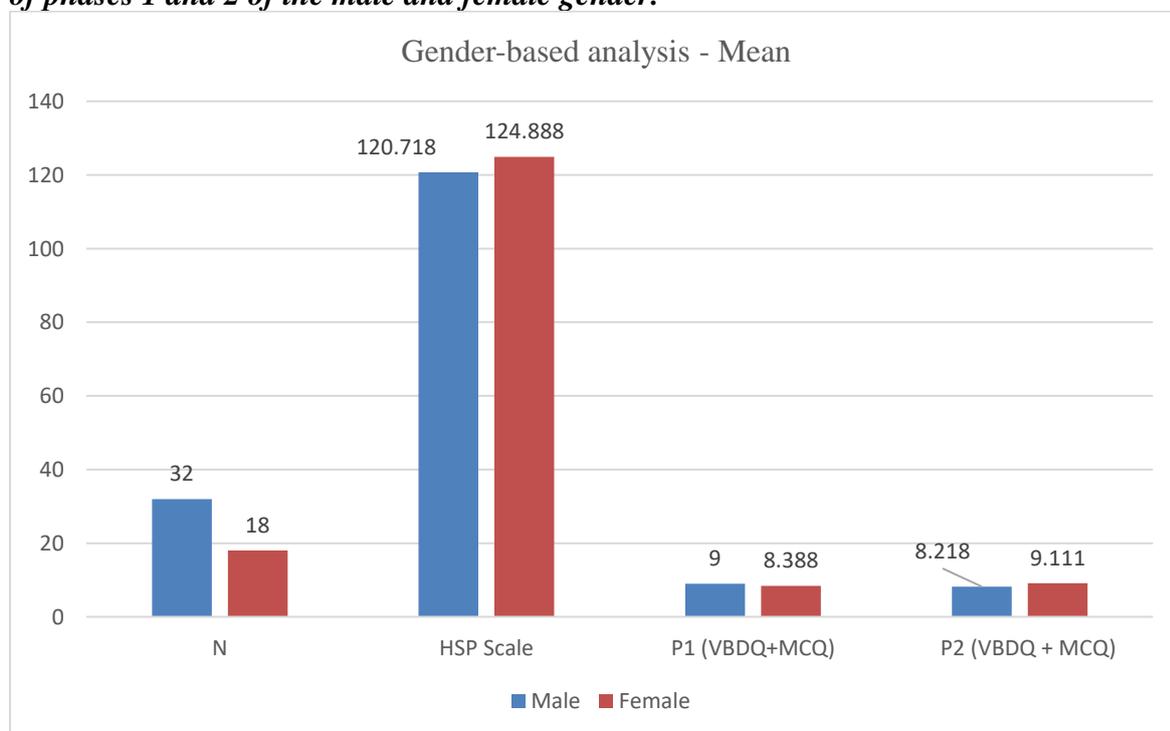
The study found that there are gender differences in retention and recalling witnessed event.

**Table 1: Mean value of HSP scale, video-based questionnaire responses of phases 1 and 2 of the male and female gender.**

Mean	N	HSP Scale	P1 (VBDQ+MCQ)	P2 (VBDQ + MCQ)
Male	32	120.718	09	8.218
Female	18	124.888	8.388	9.111

N – No. of Observations (Sample size), P1 – Phase 1, P2 – Phase 2, HSP Scale – Highly Sensitive person’s scale, VBDQ – Video-based Description Questionnaire, VBMCQ – Video-based Multiple-Choice Questionnaire (MCQ)

**Figure 1: Graph showing mean value of HSP scale, video-based questionnaire responses of phases 1 and 2 of the male and female gender.**

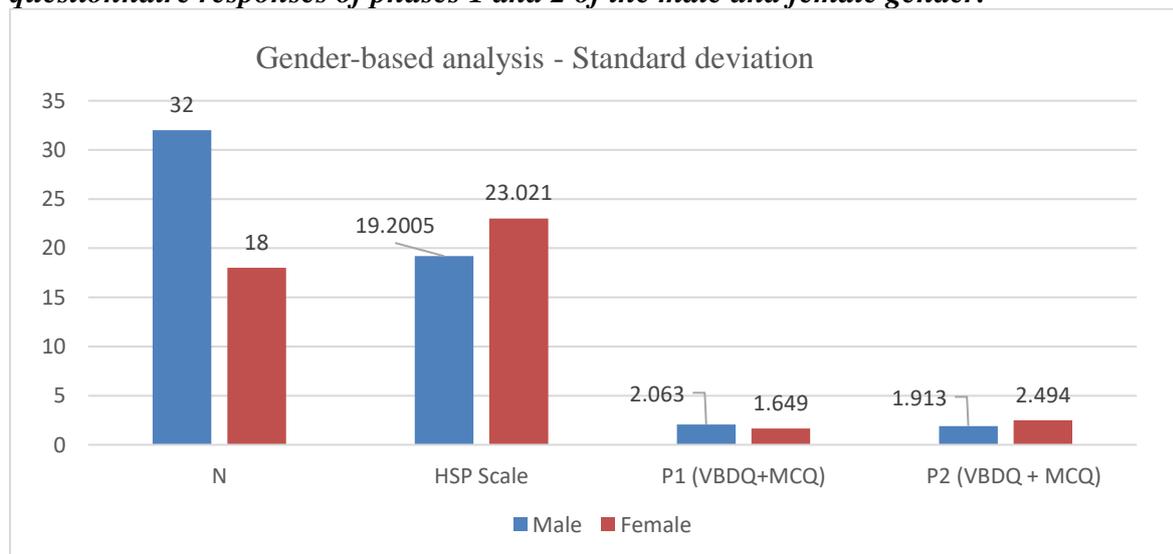


**Table 2: Standard deviation value of HSP scale, video-based questionnaire responses of phases 1 and 2 of the male and female gender.**

Standard Deviation	N	HSP Scale	P1 (VBDQ+MCQ)	P2 (VBDQ + MCQ)
Male	32	19.2005	2.063	1.913
Female	18	23.021	1.649	2.494

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**Figure 2: Graph showing standard deviation value of HSP scale, video-based questionnaire responses of phases 1 and 2 of the male and female gender.**



### **Analysis of Hypothesis 1**

Mean and standard deviation computed for male and female separately and the data was tabulated for the overall HSP scale and video-based questionnaire (both Phases 1 and 2). The result concluded that there was a slight difference when it comes to sensory processing sensitivity and gender differences. The mean score of HSP scale of female participants were 124.888 that is more compared to male participants who had a mean score of 120.718 (Table 1 and Figure 1). Due to the presence of difference in mean value between male and female participants, the hypothesis 1 found to be true. That is, females are slightly more sensitive than males in the given sample population.

### **Analysis of Hypothesis 2**

Mean and standard deviation computed for male and female separately and the data was tabulated for the overall HSP scale and video-based questionnaire (both Phases 1 and 2). The result concluded that there was a slight difference when it comes to gender differences, in retention and remembrance of an event. The mean and standard deviation score of video-based questionnaire both phases 1 and 2 of female participants were 8.3 in phase 1 and increased to 9.1 in phase 2. For male participants, mean and standard deviation score of video-based questionnaire both phases 1 and 2 tabulated and graphed in table 1 and 2, figure 1 and 2. The mean for video-based questionnaire was 9 in phase 1 and 8.2 in phase 2. On comparing both mean and standard deviation of male and female participants, it was concluded that hypothesis 2, that females tend to recall more details about the shown video than male participants in the given sample population.

## **CONCLUSION**

### **Findings of the study:**

- The data analysis of HSP scale of male and female showed that there are gender differences in Sensory processing sensitivity, that is female tend be more sensitive in sensory aspects, compared to the males in the selected sample population.
- The data analysis of HSP scale and video-based questionnaire responses of male and female showed that there are gender differences in retention and recall of a witnessed

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event, that is female participants recalled more details correctly compared to male who retained more but recalled less details presented in the video in the selected sample population.

### **Recommendations**

In order to get more effective result, the sample size could have been increased.

### **Limitations**

- The limitation of less time frame has constrained the study to be conducted for a wider population.
- The video-based questionnaire was not completely free from bias, as it was self-developed.

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### **Conflict of Interest**

The author(s) declared no conflict of interest.

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