

The Effect of Gender Differences and Age on Memory

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Abstract

Gender can have a huge effect on the recollection of events when trying to remember a scene as a witness. This paper studies the differences in recollection of events based on gender differences. Also, it studies whether age has an influence on recollection and memory of events. My sample consists of one hundred and thirty-six participants which are divided into (54 female participants and 82 male participants). They were asked to complete a survey after watching a video of a man that was walking behind a woman after dark. The survey included questions related to what the participant recalls from the video such as details of the environment as well as details of the stranger. Females scored higher on questions related to the scene or environment itself. However, males and females scored equally in questions related to the general characteristics of the stranger as well as the woman. There was no difference in memory between males and females on this part. As for age, it had no effect on the memory of the participants in the study.

Keywords: Memory, Gender, Recollection

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The Effect of Gender Differences on Memory

Memory can be marked as a workforce of the brain, which plays out the tasks of encoding, storing, and decoding a wide range of new data that an individual may experience throughout their whole life. It is the result of the storing of data in our memory that our future actions or standards of conduct become what an individual must depend on. There are various exemplars of memory such as short-term memory, long term memory, and sensory memory. There are many theories of memory talked about in the different investigations of cognitive psychology.

Bartlett's theory of reconstructive memory is distinctly refined as a substitute to discern the theory of memory, which has monopolized Western thinking of memory for two and half centuries (Danziger, 2008). Bartlett's theory is pivotal to the comprehension of the dependability of eyewitness testimony as he contemplated that the recall of information is dependent upon personal interpretation reliant on our social standards and values, and the manner in which we understand our reality. Gender schema theory has been proposed to explain gender differences in memory recall (Cherney & Ryalls, 1999). This theory explains that these gender stereotypes effect memory greatly. females should score better on remembering objects and images that are related to female stereotypes whereas males should score better on remembering objects and images that are related to male stereotypes. the remembrance of material depends on individual interpretation that is based upon social ideals and values, and the way each person reflects on his or her self. Hellmann and Crawford (1992), for example, calculated how memory differed based on gender upon normal day to day tasks. In their study, it was discovered that females scored higher and better than males on everyday tasks that were related and connected to the female stereotype. Whereas, males scored higher and better than females on everyday tasks that were related and connected to the male stereotype. Niedzweinska (2003) assessed the memory of

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information and discovered that gender schemas affected how males and females remember certain events. Males remembered more occasions related to competitive and power-oriented themes whereas females remembered more occasions associated with compassionate themes. Eyewitness testimony alludes to a record given by individuals of an occurrence they have experienced or endorsed. Mistaken eyewitness identification has long been a difficulty within the legal system (Hartwig, Granhag, & Vrij, 2005). Testimony can be unreliable for a variety of reasons. The capacity of an individual to witness details during an event then effectively recall that information is dependent on what they attend to (Wright, Loftus, & Hall, 2001). One eyewitness may focus mainly on faces (Jenkins & Davies, 1985), while others may focus on the environment surrounding the event (Areh, 2011). Memories of details related to people involved in an event such as their size, age and facial features can be biased by a variety of factors. These include individual differences, event factors and post-event information. The gender of the witness is a possible mediating factor in the perception and recollection of events (Areh, 2011; Loftus, Banaji, Schooler, & Foster, 1987; Shapiro & Brooks, 2018). As a witness, females poses greater recollection for people (Areh, 2011), probably by concentrating on details about the person rather than other factors such as the environment or the event as a whole. (Mast & Hall, 2006; Rehnman & Herlitz, 2007). However, males tended to concentrate more on the event itself and on the environment around them rather than on the person himself or herself. In that case, males were able to give a more detailed view of the event as a whole. (Postma, Jager, Kessels, Koppeschaar, & van Honk, 2004). Females relatively focus on person details because of inborn propensities regarding sex differences. Moreover, since women are usually more targeted than men, this fear of being attacked or assaulted could have an effect on why women focus on the person rather than the surrounding environment. This study focuses on assessing the effect of

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gender on witness memory in testimony. The scene circulates around a video of a man walking behind a woman after dark holding a wine bottle and a knife in his right and left hands respectively. We aim to study whether the gender and age of the witness plays a key role in recalling memories of the event in the video and the overall differences in what males and females tend to remember. The hypothesis of the study states that there is a difference between the recollection of the event based on the witness's gender and age. We believe that females will be better at recalling memories based upon the physical appearance of the stranger whereas males would be better at recalling memories that circulate around the environment surrounding the event. The null hypothesis states that there is no difference between the perception, memory, and recollection of the event based on gender.

Methods:*Participants*

136 participants were chosen randomly. 82 male participants were chosen randomly as well as 54 female participants that were also randomly selected. Ages of the participants range from 18 to 64 years of age. The sample size was determined in such a way in order to have a somewhat equal male versus female ratio in the study in order to avoid study and result bias.

Procedure

The Pearson chi-square test was used to collect the data of the study. Participants were asked to watch a video of a man walking behind a woman after dark. After watching this video, the participants had to answer a series of questions related to the physical appearance of the

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stranger as well as factors that occurred in the surrounding environment at the time of the incident.

Assessments and Measures

The questionnaire and the video were sent via email and through social media. The questionnaire used was sent via Google Docs survey questionnaire. The measure contains a 38-item questionnaire designed to assess memory recollection of a certain event. Questions circulated around describing the stranger physically such as “was the stranger a male or a female? What was the stranger wearing? etc.”. Other questions circulated around describing the environment in which the event took place such as the color of the tiles on the floor etc. This test has validity since it measures exactly what its intended to measure. We are looking for gender differences and how it affects memory. Therefore, all the questions in the measure circulate around this topic. Moreover, the measures used are high in reliability since even if we measure the differences of gender on memory one year from now, the results will still be similar. Moreover, the study has internal consistency. If another researcher was to conduct the same experiment, then he or she should be able to prove similar findings and collect similar results.

Results

The analysis of the data reveals a difference in what males and females recall. Females tend to remember events that are more detail oriented such as more details about the surrounding environment like the color of the tables and tiles etc... However, men and women showed similar memory results on questions circulating around the physical appearance of the people in the video. Age had no effect on the memory and recollection of the participants. After gathering the results from the questionnaire that was sent via google docs, the appropriate test must be

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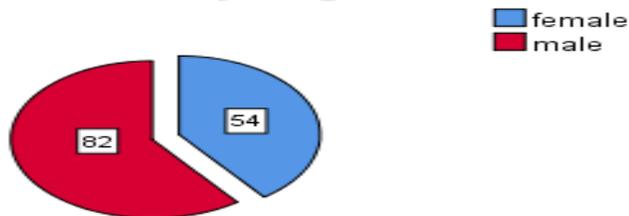
conducted. By saying that, Pearson chi-square test was used for the study. Finally, the results are interpreted through the tests done on SPSS.

Outcome 1

The results show a difference in memory and recollection based on gender differences.

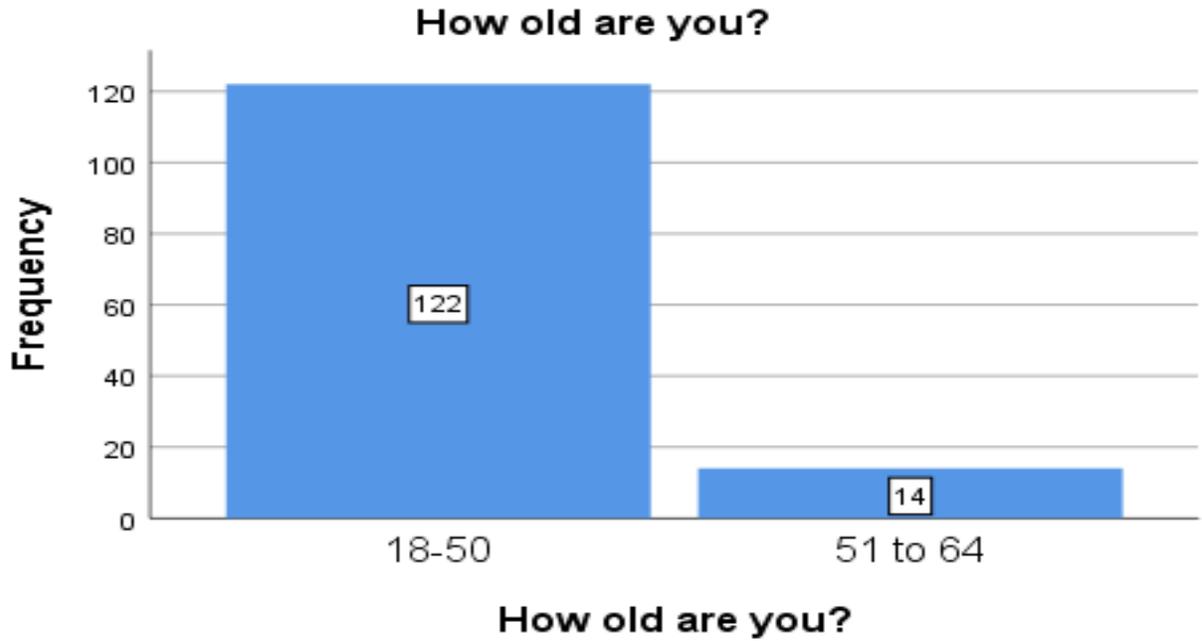
What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	female	54	39.7	39.7	39.7
	male	82	60.3	60.3	100.0
	Total	136	100.0	100.0	

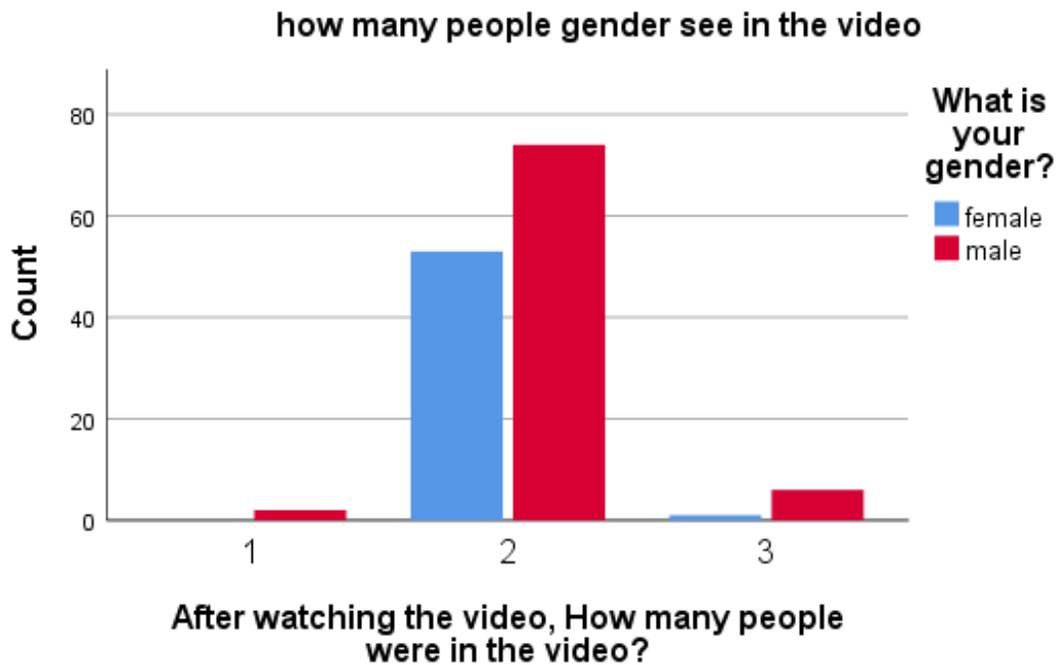
What is your gender?

This study was based on 136 responses where 54 of them are female representing 39.7% and 82 of the are males representing 60.3%.

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This graph is used to show the age distribution of responses since age is one of the most variables that affect memory and the graph shows that mainly 90% of responses are aged between 18 and 50 years old while only 10% are aged between 51 and 64 years old.



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From this graph most of responses answered that there are two people in the video and hence we can conclude that most of the people can focus on the number of people and so it doesn't differ by the gender watching the video.

Test if gender and if they see male or female in the video are dependent.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.873 ^a	2	.020
Likelihood Ratio	10.574	2	.005
N of Valid Cases	136		

Using Pearson chi-square with p-value if 0.02 which less the significant level 0.05 hence we reject the null that the variables are not related and conclude that gender and if they see male or female in the video are dependent.

What is your gender? * Are the people in the video males or females?

Crosstabulation

Count

		Are the people in the video males or females?			Total
		both	I don't know	males	
What is your gender?	female	53	0	1	54
	male	68	6	8	82
Total		121	6	9	136

From this table we can see that almost all answer that both males and females are in the video so there is no problem in seeing the person in the played video.

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Count

		Was the female following the male or was the male following the female?			Total
		female following male	I don't know	male following female	
		What is your gender?	female	0	
	male	1	9	72	82
Total		1	9	126	136

126 out of 136 responses answered that male following female in the video with zero percent error in female's response. all females answered it correctly while 10 male's answers are wrong which means that females are best observable about the order of the people in the video.

What is your gender? * What was the female holding? Crosstabulation

Count

		What was the female holding?				Total
		a baby	a bag	a phone	I don't know	
What is your gender?	female	0	33	6	15	54
	male	1	42	4	35	82
Total		1	75	10	50	136

Chi-Square Tests

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	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.924 ^a	3	.177
Likelihood Ratio	5.294	3	.152
N of Valid Cases	136		

To test if gender is related to female holding observable a Pearson chi-square test is used with a p-value of 0.177 which means that there is no evidence of relation between the two variables.

**What is your gender? * What was the male holding in his right hand?
Crosstabulation**

Count

		What was the male holding in his right hand?					Total
		book	bottle	I don't know	knife	phone	
What is your gender?	female	0	13	0	39	2	54
	male	1	11	9	59	2	82
Total		1	24	9	98	4	136

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.859 ^a	4	.065
Likelihood Ratio	12.334	4	.015
N of Valid Cases	136		

Pearson chi-square p-value=0.065 which is greater than 5% hence no evidence that gender and observing what male is holding in his right hand are related so both genders are observing right with the same percentage.

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**What is your gender? * What was the male holding in his left hand?
Crosstabulation**

Count

		What was the male holding in his left hand?					Total
		book	bottle	I don't know	knife	phone	
What is your gender?	female	0	45	2	7	0	54
	male	1	66	10	2	3	82
Total		1	111	12	9	3	136

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.776 ^a	4	.029
Likelihood Ratio	12.500	4	.014
N of Valid Cases	136		

For left hand the p-value is 0.029 which is less than 5% hence gender and what the male holds in his left hand in the video are related which mean the correct answer differs by gender and the tables show that females are best observable here.

Crosstab

Count

		What type of bottle was the male holding?					Total
		beer	energy drink	I don't know	none	wine	
How old are you?	18-50	12	2	7	2	99	122
	51 to 64	2	0	1	0	11	14
Total		14	2	8	2	110	136

Chi-Square Tests

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	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.753 ^a	4	.945
Likelihood Ratio	1.138	4	.888
N of Valid Cases	136		

Age has no effect on guessing the bottle type the male is holding in the video since both age group answered right with approximated same percentage of 81% of people who are aged between 18 and 50 years old and 79% who are aged between 51 and 64 years old.

**How old are you? * What type of top was the man wearing?
Crosstabulation**

Count

		What type of top was the man wearing?				Total
		hoodie	I don't remember	jacket	T-shirt	
How old are you?	18-50	58	7	55	2	122
	51 to 64	11	0	3	0	14
Total		69	7	58	2	136

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.064 ^a	3	.167
Likelihood Ratio	6.013	3	.111
N of Valid Cases	136		

Age also has no effect on observing the top the man was wearing where both age groups guess the right answer with same percentages

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Crosstab

Count

		What is the mans hair color?			Total
		black/brown	N/A	redhead	
How old are you?	18-50	53	68	1	122
	51 to 64	7	7	0	14
Total		60	75	1	136

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.312 ^a	2	.856
Likelihood Ratio	.412	2	.814
N of Valid Cases	136		

Pearson p-value=0.856 which is greater than 0.05 hence there is no relation between age and observing the man's hair color so both age groups observe the man's hair correctly with the same percentage.

Crosstab

Count

		What is the females hair color?				Total
		black/brown	blonde	N/A	redhead	
How old are you?	18-50	93	7	21	1	122
	51 to 64	7	2	5	0	14
Total		100	9	26	1	136

Chi-Square Tests

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	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.925 ^a	3	.177
Likelihood Ratio	4.448	3	.217
N of Valid Cases	136		

Also, both age groups observe the women’s hair color on the video correctly with the same percentages since Pearson chi-square p-value is greater than 5% hence no association between age and observing the women’s hair color in the video

**What is your gender? * What time of day was the video taken?
Crosstabulation**

Count

		What time of day was the video taken?				Total
		daytime	I don't know	nighttime	sunset	
What is your gender?	female	0	0	54	0	54
	male	1	1	79	1	82
Total		1	1	133	1	136

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.020 ^a	3	.568
Likelihood Ratio	3.080	3	.379
N of Valid Cases	136		

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This test used to show if both genders correctly guess the time of the day the test has a high p-value of 0.568 which means that gender is not related to guessing the time of the day as in a total of 136 only 3 males guess it wrong.

What is your gender? * Was there a table in the scene?
Crosstabulation

Count

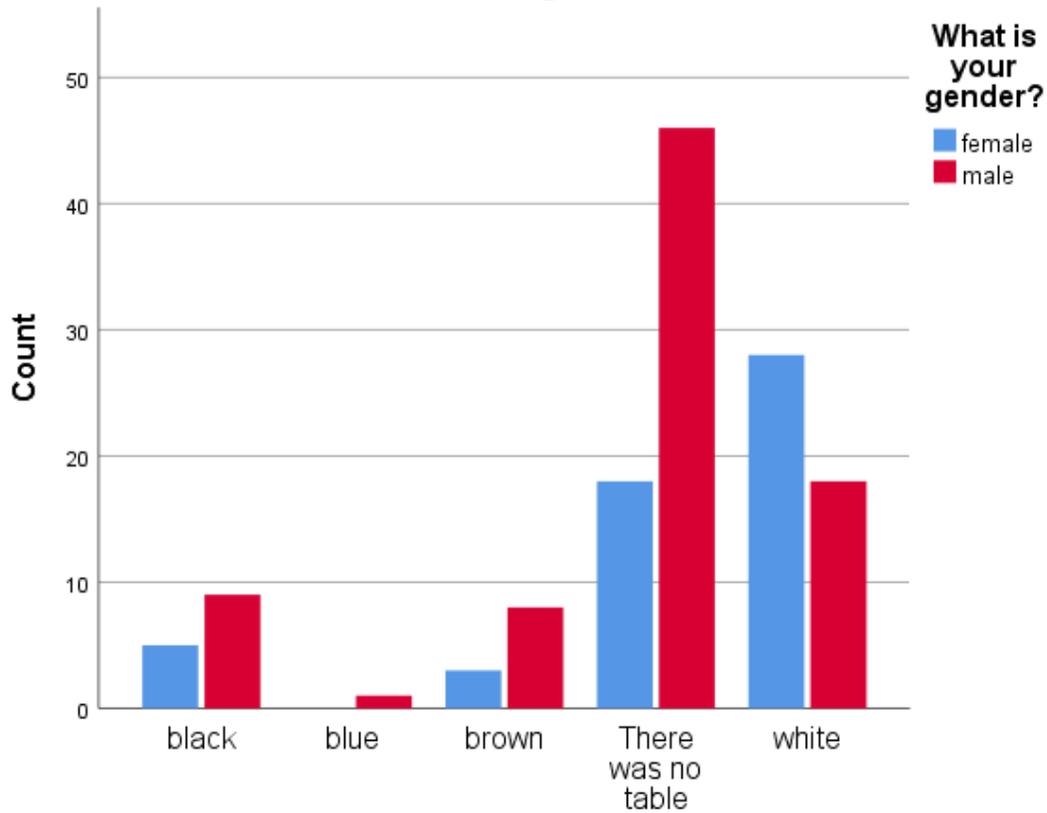
		Was there a table in the scene?			Total
		I don't know	No	Yes	
What is your gender?	female	7	17	30	54
	male	25	32	25	82
Total		32	49	55	136

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	9.823 ^a	2	.007
Likelihood Ratio	10.056	2	.007
N of Valid Cases	136		

From this table we can conclude that if the response shows the table is affected by gender since the test has a p-value of 0.007 which is less than 5% and we can observe that a better guess here with a probability of false guesses equals to 44% while its 70% for male.

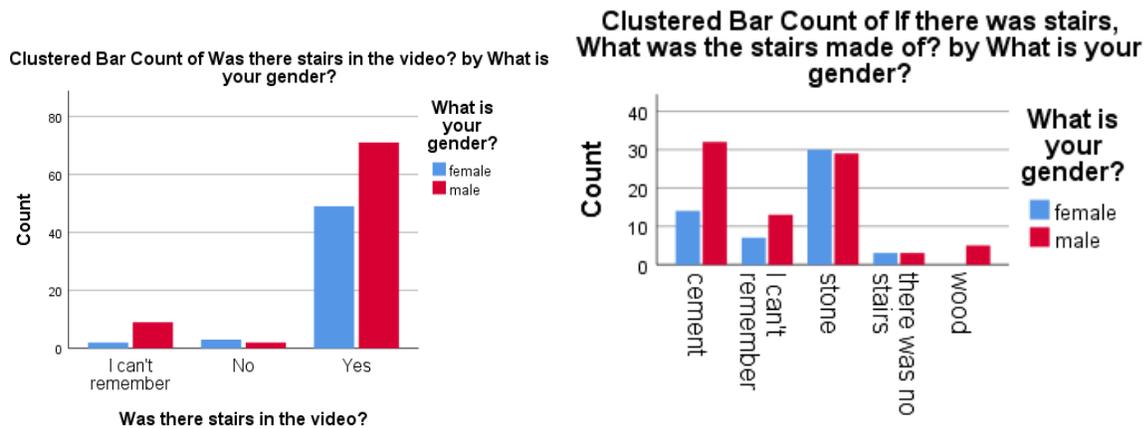
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Clustered Bar Count of If there was a table, What color was the table? by What is your gender?

If there was a table. What color was the table?

Notice that the real color of the table was white we can notice that males are less memorable about the table color so for whom who see the table we can notice that female count is lower than male in the wrong guesses (black and blue) while it is higher in the right guesses (white).

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Most of the responses noticed that there was a stair, but females are more observable about its type since out of 54 females 30 guessed the right answer about what the stairs is made of which is stone while out of 82 males only 29 guessed the right answer.

Discussion

This study looks at the differences in gender and how it affects memory. This study circulates around the theme of memory in eyewitness testimony. It was interesting to see whether males and females differ in what they remember during situations or events. Initially we thought that females would recall the stranger more than males did. This proved to be untrue. In this case, we hypothesized that females might remember details of the stranger since they are relatively more prone to danger and harassment than males are. Therefore, this gives females the need to focus on the people around them in order to eliminate or eradicate danger. In an applied context, these findings have implications for the criminal justice system. The sex of the witness can affect memory. Female witnesses may be more likely to perceive neutral situations as threatening and therefore more likely to focus on details of the people involved Longstaff, M. G., & Belz, G. K. (2020, May 22)

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whereas men don't usually focus on the people involved. This gives males the opportunity to focus more on the environment around them hence recalling more environmental cues than females do. This hypothesis proved to be untrue. Gender does have an effect on memory but not in the way we thought it to be. Females showed to be more detail oriented whereas males and females both scored equally on general cues related to the people in the video.

Conclusion

To conclude, this study has been carried out based on two groups. Gender and age were the two factors that have been studied. To start, for age, participants were divided into two groups 18-50 and 51-64. The results show that there is no difference in memory and recognition based on age since we gathered similar scores for both age groups. However, while looking at the gender of the participants, the difference between males and females, it's shown that there is no difference in noticing or remembering the general characteristics circulating around the people in the video. Details like what the stranger was holding in his hand, who's walking first, what they're wearing etc... these general details about the persons in the video were similar for both gender groups. There was no difference between them. On the other hand, the difference between both genders is that the females in addition to what the males were able to recall, females were able to recall the more detailed aspects of the environment surrounding the people in the video. Examples include, the color of the chairs, the shape of the pool etc... Finally, males and females showed no difference in the general questions related to the video. However, females are able to focus more on smaller details than males.

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