PROJECT REPORT

# Effect of trust and gender on conformity in recognition memory

Pranjal Saxena Y9424

Mentor: Prof. Amitabha Mukherjee



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# **Abstract:**

The study aims at establishing conformity effects in the case of recognition memory with stimuli involving faces of people. The results indicate a decrease in correct responses by a participant when faced with a group pressure situation of incorrect responses by 4 other participants. Conformity affects recognition of old images more than rejections of new images. The analysis also focussed on studying difference in conformity for cases with trust involved among the group and results indicated a greater tendency to conform among friends than strangers. Moreover, the conformity effects were compared for male and female participants and a greater tendency of conforming was found for males. This deviated from the established notions of women being more conforming in the society, possibly because the task difficulty varying for both males and females due to difference in information processing strategies in both the genders. Females perform better at recognition tasks as they give emphasis to minute details of the stimuli.

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## **1. Introduction:**

Individuals rely on a number of techniques to increase the accuracy of long term memory. Many times, while recounting a certain incidence that has happened between a group of friends, even correct memories associated with the incident may be influenced in a negative manner by the accounts later recovered from our peers. Broadly, this behaviour can be attributed to being a part of Social Conformity, an "act of matching attitudes, beliefs, and behaviours to what individuals perceive is normal of their society or social group"[2]. After the pioneering work of **Asch[9**] in the famous "Conformity Experiment", extensive research has been carried out in analysing the effects of peer pressures in various cognitive functions.

Conformity has been shown to depend on a number of factors like majority competence, minority influence, gender(women are perceived to be more conforming than men in accordance with social norms and rituals) and culture. Few studies have focussed on identifying effects of conformity in cases where the group is known or complete strangers. The results outline a tendency of conformity to be more with a group of friends than strangers except for the case of a normative influence task, where the motivation to conform is acceptability by the group. Also studies in terms of alcohol and cigarette abuse have shown that friends exert more social influence in this regard.

#### **1.1 Previous Work:**

There have been a number of studies which have dealt with relating conformity effects on recognition memory. **Reysen**(2005), **[3]** showed that even when participants were tested individually, they wanted to stick to the group opinion previously shown to them. This indicated that peer influence has a role in seeding new memories in individuals.

Axmacher, (2010)[1] successfully studied the influence of conformity in recognition memory, using a setup for identifying old and new images from a random sample, where he used 4 confederates to put an implicit pressure on the participant. By varying the test conditions for an easy and difficult sample, he could conclude that in the shorter or easy recognition setup, new items were not rejected only when all the confederates gave a false response. He conducted two variations of the experiment which varied the difficulty of the task, and concluded that conformity effects were more pronounced in the long version. The individual response was affected towards new and old items in the same manner in the long version, however differential affects between new and old items were observed in the short version of the experiment. The number of correct rejections didn't increase significantly with increasing number of incorrect group responses.

The nature of group significantly affects conformity effects. It is natural to assume and has been shown by previous studies that conformity effects would be much larger when the group consists of friends and there is a degree of trust prevalent. However, *McKelvey*, *Wendy; Kerr, Nancy H. (1988)* [4] argued with respect to normative influence,( conforming to be acceptable and liked by a group), that conformity would be less for a case of group of friends than strangers. Since friends would be more casual and inclined to accepting the person, pressure to confirm for normative influence might be less.

It is believed that social norms give seed to gender differences in the society. While males are seen as independent, women are taught to be coherent with the rituals in the society. Psychologists *Alice Eagly and Chrvala*[5] studied sex differences in conformity and found that women conform more and are more persuadable in pressure group situations when surveillance was involved and there was an impression of likeability in the group. However, if there was no surveillance, the results were opposite with women less likely to conform.

## 2. Objective of the study:

Here, I studied the effect of conformity on recognition memory in an experiment using 4 confederates and a test participant. Participants would be shown a sample of 50 faces one after the other. Later a mixed set of old and new images would be played, with the participants and confederates identifying them as "old" or "new". To initiate effects of social conformity, participants would be giving their response after listening to the response of each of the confederates. As the implicit pressure applied by the confederates increases due to a number of them giving the incorrect response, the participant is more likely to conform or adhere to the group, rather than relying on his own memory.

#### **2.1:** Effect of trust and gender difference:

I considered the above two factors and their effects on conformity: incorporating trust and acquaintance in these studies, where the results will be compared of a case when the confederates are complete strangers and unknown to the participant, to the case when the test participant is close friends with the confederates and there is a degree of trust prevalent. It was hypothesised that in the case where the confederates are close friends, there would be a greater tendency to conform in the participant and the number of accurate responses, would be much less than the case when the confederates are strangers.

Another interesting aspect was to see difference in conformity among males and females and trying to verify existing notions of women being more conforming. In this regard experiments were done with the participant being females and males separately.

## **3. Experiment:**

#### 3.1 Materials, design and participants:

A database of 130 images of faces of people was prepared from a social networking website: *onemillionpeople.com*. The experiment consisted of an "encoding" and a "retrieval"

phase. During the encoding phase, random 50 images were shown, and the participants had to identify old and new images from another set of images being shown in the "retrieval" phase.

Male participants and confederates were of the age group 18-20 years and total 10 trials each for stranger and friend case were done for establishing trust effects on conformity. First year students having adjacent rooms were good candidates for the friend's case. An additional 5 trials were done with female participants and confederates. They were chosen to be friends as the results of these trials were compared with the friends case in males to observe difference in conformity for both the genders



Image of the experimental setup cited from [1]. A similar setup was used for the trial with the fifth particiant responding after each of the confederates.

The confederates were used repeatedly, though their relation with the participants was ensured before the experiment. The confederates and the participant were given A4 sheets to write down their responses with the confederates already having doctored responses written on their sheets, which they said out aloud. The responses of the confederates were prepared in such a way that for 50 images, there would be 10 cases each of number of correct confederates ranging from 0 to 4. This was randomised among the confederates, to avoid an obvious disregard of their opinion by the participant.

### 3.2 Procedure:

Initially a base case was setup in the absence of confederates to establish that recognition memory was better than chance. 5 trials were done on a single participant.For the conformity experiment, the confederates were initially called and explained their roles. Later, the participant was given instructions with the confederates and was told to be a part of visual memory test. They were initially shown a set of **50 images**(encoding), each being held for a delay of **2 seconds**. After a gap of 5 minutes, the participants would be shown sets of faces which contain both the previously shown faces and novel ones(retrieval). Participants would

be asked to identify if the face was old or new, loudly and then write their responses. Its important to note here that the participant responded after the confederates, in order to make sure that the test participant makes note of their responses, there was no time limit, and the next image would be shown after the response of the test participant.

10 trials were done for each strangers and friends case, and the percentage correct answeres were normalised and plotted as a function of number of correct confederates(0 to 4). The conformity effects were compared for both the cases. To distinguish between conformity for old and new memories, number of correct recognition of old images(hits) and no of incorrect recognition of new images(false alarms) were plotted with respect to number of correct confederates for all these 20 trials. For gender difference, percentage of correct answers were compared between trials on females and males. To avoid crossing with the aspect of trust, in both the cases confederates were taken to be friends of the participant.

#### Participant selection and disregard of some trials:

As conformity is known to vary with a number of social factors such as caste, background, culture etc. it was tried to ensure that the participants didn't have much diversity in their social backgrounds. For example, in the friends case, a uniformity in the participants in terms of their exposure and background was chosen, although some influences of culture and background on conformity might have creeped in into our studies.

The results of some trials had to be disregarded as the participant didn't wait for hearing other responses and immediately wrote their response on seeing the image, even though they were instructed otherwise. A total of 3 cases for males and 1 case for females had to be discarded though they were in addition to the correctly analysed 20 trials(for males) and 5 trials(for females).

#### 4. Results:



#### • Base case(without confederates):

% correct answers(mean)= 89.6 % Hits(mean) = 90.9 Standard deviation = 6.5421 % False Alarams = 10.72 • Conformity in friends and strangers.





#### Comparison

# No of trials: 10 for each case(strangers and friends)



# • Hits and False alarms:

# • Conformity in males and females(friends case for both):



No of trials for males:10 females: 5

# 5. Analysis and Discussion:

- The results of the base case showed that on an average a person is able to correctly recognise about 90% of the images(figure 1). Hence memory is better than just chance and thus the task is reliable to study effects of conformity.
- Figure 2: The Conformity effects were well established with the percentage of correct responses keep on decreasing as more and more confederates give wrong answers. This is seen in both strangers(correct answers decrease from 80% to 66.67 % as correct confederates go from 4 to 0) and friends(decrease from 80% to 40%). These results are in coherence with what **Axmacher**[1] obtained in his short version of his experiment. One interesting result is that even when all the confederates give a correct response, the percentage of correct responses is still lower than the baseline case- 80 versus 90. Even when the confederates cancel out, the correct answers has decreased significantly. One possible explanation is that the mere presence of the group influences the participant, as he can be biased towards a response "old" or "new" depending on the previous responses given by the group.
- The results appear to be in contrast with the findings of **Raysen**[3]. He investigated the influence of only two confederates on recognition of words and found that while the percentage of correct responses decreases when one of the conf. give an incorrect response, the difference doesn't increase if both of them give an incorrect response. However, as Axmacher pointed out and in accordance with our study, the group impression is much more profound if there are 4 members versus two, and 4 participants giving an incorrect response forms a stronger impression than just two participants. One more difference that needs to be accounted is that due to difference in nature of the tasks, rejection of unseen stimuli is by different mechanisms.
- Figure 4: From the analysis conformity analysis of hits and false alarms, it is observed that while the hits decrease continuously with incorrect confederates, there is no significant escalation in the false alarms and a slight rise is observed only in the zero confederates correct case. These are coherent with the results Axmacher obtained in the short version of his experiment, and points to the fact that we are more likely to forget old memories rather than form impressions of new ones while being influenced by a group.
- Figure 3: The comparison of conformity in strangers and friends case illustrates conformity effects more profound when the confederates are all friends of the participants. It is important to note here, that in this task, the motivation to conform is to give an accurate response(as the participant is convinced that he is a part of a visual memory test), thus making it an informational influence task. This is the primary difference from the work of *McKelvey*, *Wendy; Kerr, Nancy H. (1988)* where the task designed was a normative influence one, whereby the motivation of conforming was to be liked and accepted by the group, and there would be relatively less pressure to conform with friends. This difference is what accounts for the contradiction of results in our study from theirs.
- Figure 5: When the conformity effects on males and females were studied, it was observed that conformity effects on females was slightly less than males. This is in contradiction with the prevailing notion of women being more conforming than males. However, one aspect

which influenced our results heavily is that, for females, the nature of the task was much easier than males. Women are known to adopt a more comprehensive approach to information processing while males organise information in a self related manner: *McGivern RF, Huston JP, Byrd D, King T, Siegle GJ, Reilly J.(1997)[7]*. Also previous experiments by *Richard B. May and Corinne Hutt(1974)* [6] have observed a better performance by females than males in recognition memory tasks.

Thus females pay attention to the minute details like earrings and nature of hair for both male and female faces while trying to recognise the given stimuli. On the other hand men might only relate to male faces and are not able to perform as efficiently as females in this particular task. This variation in task difficulty for the two genders can be accounted for the observed results in which males conformed more than females in our studies.

*Alice Eagly and Chrvala* observed that women conformed more when there was a group pressure setting and an impression of likability. However, our study deviates from these results possibly because of the ease of task involved for females, and also the fact that there wasn't any pressure for acceptance by the group, thrust being on giving accurate responses.

# 6. Future improvements:

The analysis of old recognitions versus new rejections with conformity, may be more compact if the image data sets used is changed for each trial. I used a fixed data set for both encoding and retrieval sets, which could ensue possibilities of preferences for old or new images with some being easier to remember than others, and hence affecting our results.

Also, the experiment can be done on a larger set of females(currently I considered 5 trials) to obtain a more comprehensive data set and then review the comparison of results obtained in the male participant's case.

# 7. Acknowledgements:

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# 8. References:

[1]: Axmacher N, Gossen A, Elger CE, Fell J (2010) Graded Effects of Social Conformity on Recognition Memory. PLoS ONE 5(2): e9270. doi:10.1371/journal.pone.0009270 author ={Axmacher, Nikolai AND Gossen, Anna AND Elger, Christian E. AND Fell, Juergen}, {PLoS ONE}, journal = publisher = {Public Library of Science}, {Graded Effects of Social Conformity on Recognition Memory}, title = year =  $\{2010\},\$ month = $\{02\},\$ volume =  $\{5\}$ , url ={http://dx.doi.org/10.1371%2Fjournal.pone.0009270}, {e9270}, pages =

[2]: http://en.wikipedia.org/wiki/Conformity Date accessed: 26th September,2011.

[3]: Reysen MB (2005) " *The effects of conformity on recognition judgements*". Memory 13: 87-94.

[4]: McKelvey, Wendy; Kerr, Nancy H. (1988). "Differences in conformity among friends and strangers". *Psychological Reports* **62** (3): 759-62

[5] <u>Eagly, Alice H.; Chrvala, Carole</u>, Psychology of Women Quarterly, v10 n3 p203-20 Sep 1986: "*Sex Differences in Conformity: Status and Gender Role Interpretations.*"

[6]\_Richard B. May and Corinne Hutt : "*Modality and Sex Differences in Recall and Recognition Memory*", Child Development Vol. 45, No. 1, Mar., 1974

[7] <u>McGivern RF</u>, <u>Huston JP</u>, <u>Byrd D</u>, <u>King T</u>, <u>Siegle GJ</u>, <u>Reilly J</u>., <u>Brain Cogn.</u> 1997 Aug;34(3):323-36, :" Sex differences in visual recognition memory: support for a sex-related difference in attention in adults and children."

[8] <u>www.onemillionpeople.com</u> : Author: charity: water, Date accessed: 5<sup>th</sup> October, 2011.

[9] Asch, S. E. (1951). "Effects of group pressure upon the modification and distortion of judgment". In H. Guetzkow (ed.) *Groups, leadership and men.* Pittsburgh, PA: Carnegie Press.