

Studying Intercultural Contact Through Stereotype Threat

Nimisha Gupta*

Gujarat Forensic Sciences University, Gandhinagar, Gujarat, India

ABSTRACT

The objective of the present research was to study stereotype threat as a mean of intercultural contact among target audience i.e. college going females on their mathematical ability. It was hypothesized that females will perform poorly and will take more time in comparison to males on the applied numerical ability test. The stereotype 'women are poor in numerical ability' was activated in stereotype threat condition. For this purpose, the Numerical ability subset of Differential Aptitude Test was administered under the stereotype threat condition and under the no stereotype threat condition. Each reading set contained one male and one female. The participants were matched between 18–21 years and based on stream and geographical background. Different ways of rapport formation and sets of instructions were given to participants in each condition. For the participants of stereotype threat condition, the stereotype that 'women are poor in mathematical ability' was activated whereas no such activation was done in the no stereotype threat group. Data was pooled in for both stereotype and no stereotype threat conditions ($n=50$). The results between the males and females in stereotype and no stereotype threat condition and between males and between females in both conditions were found to be insignificant. The limitation of the study was that the data were collected through convenience sampling, was not homogenous and included participants from various cultures. The study can be expanded by taking participants from different cultures and age groups for future research in this direction.

Keywords: college students, numerical ability test, stereotype threat

***Corresponding Author**

E-mail: nimishagupta39@yahoo.com

INTRODUCTION

Intercultural Contacts

Cultural competence involves self-understanding, knowledge of others whose cultural origins and values are different from their own, and adapting one's own behaviors to the needs of culturally diverse groups [1]. Defined cultural competence as the ability to use context-appropriate cultural knowledge in intercultural interaction, and the flexibility to switch cultural frames for sense making. Social competence as "the ability to understand and manage men and women, boys and girls- to act wisely in human relations".

After many attempts it was realized that although expertise and specific skills are

necessary for competent social behavior, they are not sufficient for attaining personal goals and promoting interpersonal relationships. Two crucial but overlooked components of social competence that predict competent social behaviors and positive affect in interpersonal interaction are sensitivity to subtle cues about the psychological meanings of changing situations and discriminate use of social knowledge and skills across situations. Similarly, a hallmark of competent cultural behavior is the ability to switch the mode of interpretation flexibly and adaptively as individuals navigate situations across different contexts.

Psychological Benefits of Intercultural Contacts

Cultural Frame Switching

People having expertise in two cultures (usually by cultural diffusion) interpret social events by filtering one situation through one cultural lens and the other by the other cultural lens and thus respond to subtle cues according to the cultural requirement. Bicultural individuals do not just passively respond to cultural cues. These cues activate their associated cultural knowledge, but a bicultural individual applies the activated cultural knowledge only when it is applicable to the current situation. The person, exposed to a new culture, becomes capable of surviving a new culture. Apart from cultural diffusion, individuals may also become expert in a foreign culture by staying abroad and by migration.

For example, growing up in the British colony of Hong Kong, many Hong Kong Chinese undergraduates are familiar with both Chinese and American cultures. They acquire their expertise in American culture through many different sources, one of which is cultural diffusion. For instance, there are a number of US TV channels and many movies that release there. By comparison, Chinese channels in the US are just around 3 and hardly any Asian movie releases there. Due to the Hong Kong Chinese's fluency in both Chinese and American cultures, in response to subtle cues of the cultural requirements of a situation, their interpretation of social events is filtered through a Chinese cultural lens in one situation and an American lens in another situation (Hong et al., 2000). This phenomenon is referred to as cultural frame switching.

Flexibility in Behavior Strategies

Bicultural individuals also switch their behavioral strategies in response to the situational cues of cultural demands. Those connected to different cultures are able to

make momentary and adaptive shifts in behaviors according to the needs. Easterners have a greater tendency than westerners to attend to object-context relations and perhaps are more adept at decoding indirect meaning in conversations. Intercultural contact can increase flexibility in behavioral strategies in multicultural contacts.

In one study, East Asian and European American students read the transcript of a meeting between a reviewer and a reviewee at an employee evaluation meeting. The participants did not have access to the reviewer's performance evaluation of the reviewee and their task was to infer the performance evaluation based on the indirect information at the meeting. As expected, East Asian business students made fewer errors in recovering the original performance evaluation from the indirect information, compared to European American business students.

Knowledge of a Second Culture

Bicultural individuals who are enmeshed in more than one culture acquire nuanced understanding of other cultures, which enables them to navigate situations in second cultures as experts and increase behavioral flexibility. It also enables a bicultural individual to interact competently with a person from another cultural group.

In a study, asked Chinese and European American students to persuade a Chinese or American target to purchase an insurance policy. In this study, Chinese American students were more likely to tailor arguments according to the target's ethnicity based on their knowledge of Chinese and American cultures; they used more promotion focused arguments (that focus on possible gains) for an American target than for a Chinese target. In contrast, the target's ethnic identity did not affect European American's choice of

persuasive messages. In contrast, irrespective of the target's ethnicity, European American students used more promotion focused arguments (that focus on preventing possible losses).

Creativity and Openness to Experiences

When a cultural lens is repeatedly used to make sense of the environment, it becomes a learned routine and a part of 'routinized' culture. Thus, although culture provides conventional tools for sense making and problem solving, it also impedes creativity. Intercultural experiences may help foster creative expansion of idea. What is conventional knowledge in one culture may be unconventional in another. For example, Idea A say the cooking of traditional Chinese food is highly accessible in Chinese culture but inaccessible in African culture. Conversely, Idea B, the traditional African dishes is highly accessible to the African culture but relatively inaccessible to Chinese culture. An individual who has extensive knowledge in both the cultures would be able to retrieve to both the ideas spontaneously and, place the two ideas in juxtaposition, and through creative insights integrate the two ideas into a novel one, thus, perhaps creating a new dish altogether. Through increased exposure to seemingly inconsistent strands of ideas from diverse cultures, multicultural individuals may gradually weave these ideas into their cultural life and in the process of doing so, become more creative and open.

Some Boundary Conditions

Intercultural contact does not always lead to openness or unbridle the effect of conventional knowledge on thinking. One boundary condition of intercultural contacts' psychological benefits is the need for cognitive closure. It was found that European American students with richer multicultural experiences tend to include more foreign ideas in a creative

expansion task. But an additional study also showed that the effect of multicultural experiences on openness to foreign ideas disappeared when they needed to perform the conceptual expansion task under time pressure.

Cultural contact may sometimes also promote culture-centrism and intercultural animosity under some circumstances. When individuals are constantly exposed to death scenes and are encouraged to pledge allegiance to their peer group in the environment, conflicts tend to escalate with increased inter cultural contacts. Subject to certain conditions, like equality and equanimity, harmony and mutual cooperation, etc., intercultural contact may indeed reduce intercultural bias. Intercultural bias can still be reduced further subject to the fact that, first, the contact occurs under an atmosphere of cooperation and when the cultural identity of the interaction partner consistently remains salient throughout the interaction. Further there is self-disclosure during the interaction and the interaction partner is seen to be a typical member of the cultural group under study. Intercultural contact thus reduces negative bias toward the out-group when these conditions are met.

Psychological Costs of Intercultural Contacts

Rejection Sensitivity

When an individual meets another culture, the dimensions of social comparison and social dominance may be highly salient. For the disadvantaged group, contact with the advantaged group may bring psychological costs. They may be discriminated and although these practices are often subtle, some people are particularly sensitive to these cues and may interpret them as signals of themselves being excluded from the mainstream society. For example, conducted an experiment where white undergraduates had to make speeded

judgment of whether a figure presented on a computer screen was a hand tool or a handgun. These students were more likely to misperceive a hand tool as a handgun when the presentation of the target figure was preceded by a brief presentation of the face of a black man than when it was preceded by a brief presentation of a white face.

Maintaining the Status Quo

According to social dominance theory, in social contexts in which groups have unequal power, some ideologies emerge to justify and maintain group hierarchy. Moreover, some individuals adhere to more strongly to these ideologies than others. Dominance seeking members of a positively reputed group may try to outperform others when the situation confers an opportunity to enhance their status. In an identified domain where one's group has a more favorable reputation than their groups, individuals with a strong dominance orientation may be particularly motivated to do well, when the situation offers an opportunity for status enhancement. The increased motivation may in turn lead to better performance, again confirming the prevailing stereotypes. When social comparison and social dominance are made salient, intercultural contact will evoke a set of psychological processes that maintain the hierarchical rankings of the positively reputed groups over the negatively reputed groups in valued domains.

In study, conducted a study on European Canadians by using a personality measure. They assessed the levels of social dominance. In Canada, European Canadians' superiority over black people as a stereotype is widely distributed in the intellectual domain. Due to this, some European Canadians might believe that they are entitled to that position. Thus, they have a strong social dominance orientation. A scenario where they are

tested on intellectual ability by a black experimenter may pose a threat to their superiority while as a response they may also put in extra effort to maintain the superiority. Danso and Esses found this in their study too. They saw that European Canadians with a strong social dominance orientation performed better in mathematical ability test when a black experimenter administered the test than when it was administered by a Caucasian. On the other, those with not a strong orientation showed no effect on performances based on the ethnicity of experimenter.

Stereotype Threat

It is a general threat posed by negative reputations about one's own group. The group's reputation poses a threat for the individual, making them doubt their abilities and fear that they may confirm the group's negative stereotype. Due to the psychological pain invoked by stereotype threat, members of a negatively stereotyped group psychologically and behaviorally disengage from the threatened domain.

In a number of studies, had African and European American participants finish a test like that of Graduate Record Examination (GRE) of verbal ability. The examiners additionally got their SAT scores, which were utilized to predict their performance in GRE type test. The research question was if the stereotype threat would negatively affect the performance of African Americans on the verbal test to the extent that they would be unable to perform as per the level anticipated from their SAT scores. The students were randomly assigned to diagnostic and non-diagnostic scenarios.

Before the verbal ability test, those in diagnostic condition were told that this test was representative of their weakness and strength in verbal/ reading ability. The

negative stature of the African Americans on verbal ability may lead to stereotype threat. On the other hand, in other situation, they learnt that the study was related to the psychological factors of verbal reasoning. No mention of verbal abilities was made. In this condition then, the Afro Americans shouldn't undergo stereotype threat. Also, as the European Americans do not have negative stature on verbal abilities, the manipulation should not affect them at all.

The results confirmed that stereotype threat could impair performance of members of a negatively stigmatized group. In these experiments when the test was not diagnostic of verbal ability, African and European Americans were able to reach their projected performance to the same extent. However, when the test was diagnostic of verbal abilities, African American students were significantly less able to attain their projected performance than were European American students. Whereas European American students' performance was not affected by the diagnostic manipulation, making the test diagnostic of verbal abilities significantly depressed African Americans' performance.

An additional study showed that even when the participants were not told that the test was diagnostic of verbal ability, making African American students aware of their ethno-cultural identity could also pose a stereotype threat. This study was different from their prior studies only in the way that ethnic manipulation replaced the diagnosticity manipulation. All participants were told that the study concerned psychological factors related to verbal reasoning. To make ethnicity salient, half of the participants were asked to indicate their ethnicity in a brief personal information questionnaire prior to taking the test and half were not.

When ethno-cultural identity was not salient, African and European Americans were equally capable of reaching their projected performance. However, when ethno-cultural identity was salient, African Americans were less able to reach their projected performance, compared to their European American counterparts.

The findings from these studies confirm that the existence of a stereotype that reflects negatively on one's group may pose stereotype threat in situations where one is at risk of confirming it as a self-characterization. African Americans students are aware of their group's negative reputation on reading and verbal abilities. When they enter and interpret a situation as one where an African American's verbal abilities are being assessed, they may experience a stereotype threat and debilitate.

Controlling Mechanisms

A history of stigmatization and internalized feelings of inferiority are not necessary for an individual to experience stereotype threat.

To provide evidence for this, Aronson et al. (1999) selected Caucasian men who scored 610 on 800 or above in mathematics section of SAT. The selected participants also indicated that mathematics was important to them. These participants were selected because they were unlikely to have a chronic history of stigmatization and internalized inferiority feelings in the domain of mathematics. Therefore, if it could be shown that this group could also be led to experience stereotype threat, then history of stigmatization and internalized inferiority feelings were not necessary for the activation of stereotype threat.

The participants were randomly assigned to the stereotype condition and the control condition. All were given 20 minutes to

complete the 18 questions derived from the GRE mathematics subject test. To activate stereotype threat, prior to taking the mathematics test, participants in the stereotype condition were asked to skim over national newspapers and prominent journal articles that emphasizes a ‘growing gap in academic performance between Asian and white students’. They were also told that the study was specifically concerned with understanding why Asians appeared to outperform other students on tests of math ability. This manipulation was intended to make the participants feel targeted by a stereotype relevant to their mathematical ability. Participants in the control condition did not read any articles or hear any mention of Asian-White ability differences prior to completing the mathematics test.

The results revealed that male white students who were good at mathematics might also be vulnerable to stereotype threat. Performance was significantly lower in the stereotype condition than in the control condition, suggesting that a chronic history of stigmatization and internalized feelings of inferiority are not necessary for the activation of stereotype threat.

Mediating Mechanisms

When the group has a negative reputation in a domain, stereotype threat activates the cognition and the fear that one would confirm the negative stereotype and incorporate it into one’s self characterization. Thus clearly, group identity and self-doubt should mediate the effect of stereotype threat. One is afraid that group’s negative reputation in the intellectual domain would get confirmed and individuals under stereotype threat may reduce their motivation to perform and accordingly elicit a disruptive reduction in cognitive effort.

Steele and Aronson provided evidence for this position. In their study, African and European American students were

recruited to either take a diagnostic test of verbal abilities or participate in a study about the psychological factors of verbal reasoning. After the participants had reviewed some sample items in the test, they took a word completion task. The task consisted of 80 word fragments with missing letters specified as blank spaces (e.g., L A _ _). Some of these fragments had one possible solution reflecting race or Africans Americans. [e.g., _ _ C E (RACE), M I _ _ _ _ (MINORITY)] and some had one possible solution as a word reflecting self-doubts [e.g., L O _ _ _ (LOSER), S H A _ _ (SHAME)]. If ethnic identity and self-doubt were cognitively accessible, participants would more likely complete these word fragments with words related to race and self-doubt than words unrelated to these ideas. For instance, for the C O _ _ _ , they would more likely complete it with COLOR than COAST.

Afro Americans and European Americans did not differ in the likelihood of listing words related to self-doubt or race when the diagnosticity of the test was not emphasized. However, when the test was depicted as a diagnostic test of verbal abilities, Afro Americans were so much more likely to list words related to self-doubt and race.

This shows that one’s cultural group membership, self-doubt, stress reactions and reduction in mental effort impacts the performance based on the stereotype threat.

Impact and Consequences of Stereotype Threat

Academic performance of an individual is impacted and threatened by stereotype threat and this can harm the academic performance. Every group is characterized by some sort of stereotype and salient social identity, if any, can affect performance on a task. Stereotype threat effects have been shown with a wide range

of social groups and stereotypes including, but not limited to: women in math, Whites compared with Asian men in mathematics, and young girls whose gender has been highlighted before completing a math task. Many of such factors could play a role in one's "stereotype vulnerability." Some of the potential outcomes of such a stereotype threat are not only decreased performance in academic and non-academic domains and increased use of self-defeating behaviors but disengagement, altered professional aspirations also.

Similarly, as per researchers Nussbaum and Steele, it is argued that short-term disengagement allowed Black students under stereotype threat to maintain their motivation on a task in a study.

Further, by redirecting their aspirations and career paths, some research has emphasized that stereotype threat can significantly alter stereotyped students' professional identities. In male dominated disciplines, women undergraduates reported higher levels of sex discrimination and stereotype threat. So much so that they were thinking of changing their major compared to women in fields that were not dominated by men.

In another scenario, women were less likely to express interest in taking more math classes in the future, when their sense of belonging was reduced by their perceptions of a stereotypical environment and they ended earning lower course grades.

Implications of Stereotype Threat

Stereotype threat and its susceptibility are applicable across groups and are not just limited to African Americans. This concept has been applied to multiple stereotypes affecting different groups and in different domains. Stereotype susceptibility causes men to be less socially sensitive, white men to be less

athletic and student athletes to be less academic. Also, as cultural stereotypes changes, so does the impact of stereotype threat. In France, stereotype susceptibility was seen in low socioeconomic students on academic tests. Stereotype threat was found in female again students as early as kindergarten, with those coloring pictures of girls with dolls significantly underperforming on math tests when compared to those who colored pictures of landscapes or children eating with chopsticks.

In order for stereotype susceptibility to occur, an individual must first identify with and be in the upper echelons of the stereotyped domain. For instance, females are only susceptible to the negative stereotype of women and math if they are proficient in math and it is important to their self-concept. There is a difference between stereotype threat and internalized feelings of group inferiority, supported by the fact that even white men fell victim to stereotype susceptibility when the stereotype of Asian superiority in math was made salient.

Students do not have to believe a stereotype for stereotype threat to occur, simply the knowledge that the stereotype is prevalent in society is enough to trigger stereotype threat and cause stereotype susceptibility.

Finally, stereotype threat is an additional pressure, on top of whatever pressure already exists in the situation for everyone, such that people in a stigmatized group face an additional burden.

Literature review [2] studied stereotype threat and women's achievement in high level math courses. Results of a field experiment were reported that tested the usefulness of the stereotype threat formulation for understanding women's performance in upper levels of college

mathematics – men and women who are highly motivated and proficient mathematicians and who are in the pipeline to mathematics and science professions. When test was given with standard instructions as in control group, women and men showed same level of performance. This shows that with the most qualified women in the field as well as those who have taken mathematics in college and are persistent, stereotype threat negatively affects test performance.

A study on relation of women's performance in mathematics and stereotype threat was conducted by [3–6]. Women are often judged as having poor mathematical ability than men. It was hypothesized that it would affect their performance due to the apprehension caused. In one study, a sample of women and men was selected and it was seen that women underperform on hard mathematical tests as has been time and again seen in literature. In another study, it was shown how, upon lowering the stereotype threat by reporting to participants that the test does not generate gender differences, the differences in performance could be removed. It has been widely believed that females are poorer in mathematics as compared to males. There are very less researches on this aspect and on stereotype threat in the Indian context, thus this study is being conducted to see its applicability and relevance in the Indian scenario.

The objective of the present research was to study stereotype threat as a mean of intercultural contact among target audience i.e. college going females on their mathematical ability.

Based on the literature reviewed, two hypotheses were formulated for the present study.

- (1) Females will perform poorly in comparison to males on the numerical ability test upon activating the threat condition that 'women are poor in numerical ability'.
- (2) Females will take more time in comparison to males under stereotype threat condition.

Participants

The differential aptitude test's subset of numerical ability was administered. Each condition had one male and one female matched on age (18–21 years), stream and geographical background. The data was collected through convenience sampling.

Design

The objective of the present research was to study stereotype threat as a mean of intercultural contact among target audience i.e. college going females on their mathematical ability. An experimental design was used for the present study and convenience sampling was used to collect the data. Participants in the experiment were assigned in two conditions i.e. Stereotype Threat condition and Control Condition. In each condition, the DAT numerical ability test was administered to 1 male and 1 female matched on age (18–21 years), stream and geographical background. They were instructed to try finishing the test in 15 minutes. Different sets of rapport formation were given to participants in each condition. For the participants of stereotype threat condition, stereotype 'Women are poor in mathematical ability' was activated whereas no such activation was done in the control group (Table 1).

Table 1. Design of the study.

Independent variables	Dependent variables	Control variables	Methods of control
Stereotype activation vs. no activation	- Performance on math test - Time taken to finish the test	- Age (18–21 years) - Stream - Geographical background	These were ensured during selection of participants

Measure

The differential aptitude test (DAT) is a multiple aptitude battery designed to measure adults' ability to learn or succeed in certain areas. One of the subset of differential aptitude test is numerical ability test. It measures the ability to perform mathematical reasoning tasks. Numerical reasoning is important for success in such courses as mathematics, physics, chemistry, and engineering. The ability to reason with numbers is also important in many occupations, such as accounting, laboratory work, carpentry, and technicians and engineering.

Procedure

The objective of the present research was to study stereotype threat as a mean of intercultural contact among target audience i.e. college going females on their mathematical ability. The numerical ability subset of DAT was administered under the stereotype threat condition and under the no stereotype threat condition. Each condition had one male and one female. The participants were matched between 18 and 21 years, stream and geographical background. They were instructed to try finishing the test in 15 minutes. Different way of rapport formation and sets of instructions were given to participants in each condition. The rapport formation and sets of instructions to the male and female in each condition were given together. For the participants of stereotype threat condition, the stereotype that 'women are poor in mathematical ability' was activated whereas no such activation was done in the no stereotype threat group. Proper instructions were given to the subjects before the conduction. It was made sure that no item is left blank. After conduction, the scoring was done. Data was pooled in for both stereotype and no stereotype threat conditions (n=50 for each group). To find out the significant mean differences between the two conditions, independent t-test was used. Also, the same statistical technique was used to analyze males and females of both the conditions.

Results

To examine the effect of stereotype threat among college going females the Numerical ability subset of Differential Aptitude Test was administered under the stereotype threat condition and no stereotype threat condition. The participants were matched on age, stream and geographical background. For the participants of stereotype threat condition, the stereotype that 'women are poor in mathematical ability' was activated whereas no such activation was done in the stereotype threat group.

On pooling in the group data, n=50, mean, t-value and p value were calculated between the males and females in both stereotype threat condition and no stereotype threat condition. Tables 2 and 3 show the mean, t value and p value between males and females of stereotype and no stereotype threat condition respectively. Table 4 shows the mean, t-value and p value between males in both conditions while Table 5 shows the mean, t- value and p value between females in both the conditions.

Table 2. Group scores: mean, t-value and p-value of males and females in stereotype threat condition.

	Stereotype threat condition	
	Male	Female
Mean	24.85	22.35
t Value	-1.29	
p Value	0.100431	

The t value obtained at p value 0.100431 is -1.29 which is insignificant.

Table 3. Group scores: mean, t-value and p-value of males and females in no stereotype threat condition.

	No stereotype threat condition	
	Male	Female
Mean	26.25	24.58
t value	-0.94	
p value	0.18	

The t value obtained at p value 0.18 is -0.94 which is insignificant.

Table 4. Group scores ($N=160$): mean, t -value and p -value of males in stereotype threat condition and males in no stereotype threat condition.

Conditions	Stereotype threat condition	No stereotype threat condition
	Male	Male
Mean	24.85	26.25
t value	-0.77	
p value	0.22	

The t value obtained at p value 0.22 is -1.77 which is insignificant.

Table 5. Group scores ($N=200$): mean, t -value and p -value of females in stereotype threat condition and females in no stereotype threat condition.

Conditions	Stereotype threat condition	No stereotype threat condition
	Female	Female
Mean	22.35	24.58
t value	-1.17	
p value	0.12	

The t value obtained at p value 0.12 is -1.17 which is insignificant.

DISCUSSION

The objective of the present research was to study stereotype threat as a mean of intercultural contact among target audience i.e. college going females on their mathematical ability. The numerical ability subset of DAT was administered under the stereotype threat no stereotype threat condition. Each condition had one male and one female. The participants were matched between 18 and 21 years, stream and geographical background. They were instructed to try finishing the test in 15 minutes. Different way of rapport formation and sets of instructions were given to participants in each condition. For the participants of stereotype threat condition, the stereotype that 'women are poor in mathematical ability' was activated whereas no such activation was done in the no stereotype threat group. After conduction, the scoring was done. Data was pooled in for both stereotype and no

stereotype threat conditions ($n=50$ for each group i.e. 50 males and 50 females under each condition).

The rapport formation and instructions to the male and female were given together, thus there was a sense of competition present.

A study on relation of women's performance in mathematics and stereotype threat was conducted by [6]. Women are often judged as having poor mathematical ability than men. It was hypothesized that it would affect their performance due to the apprehension caused. In one study, a sample of women and men was selected and it was seen that women underperform on hard mathematical tests as has been time and again seen in literature. In another study, it was shown how, upon lowering the stereotype threat by reporting to participants that the test does not generate gender differences, the differences in performance could be removed.

A study on relation of women's performance in mathematics and stereotype threat was conducted by [6]. In one study, a sample of women and men was selected and it was seen that women underperform on hard mathematical tests as has been time and again seen in literature. In another study, it was shown how, upon lowering the stereotype threat by reporting to participants that the test does not generate gender differences, the differences in performance could be removed.

The results show that females performed poor as compared to males. This clearly proves the second hypothesis of the research that females will take more time in comparison to males in stereotype threat condition.

The research on both conditions i.e. the stereotype and no stereotype condition involving one male and one female in each

condition was done. The data was pooled for $n=50$ in each group. The total data collected was $N=200$ comprising of 50 males each in stereotype and no stereotype condition and 50 females each in stereotype and no stereotype condition. Individual t test was used for the analysis.

For stereotype threat condition (Table 2), t value obtained was -1.29 at p value 0.100431 which is not significant because $p > 0.05$. This is because there was no major mean difference between the two groups (24.85 and 22.35 for males and females respectively). Hence, the hypothesis that the females will perform poorly in comparison to males on the numerical ability test upon activating the stereotype 'women are poor in numerical ability' in stereotype threat condition is not proved.

For no stereotype threat condition (Table 3), the t value obtained was -0.94 at p value 0.18 which is insignificant as $p > 0.05$. This is because there are no major mean differences between the two groups (26.25 for males and 24.58 for females). This shows that the performance of females were similar to those of males.

The results obtained in the stereotype threat condition were insignificant due to the fact that women took the test in a challenging manner. They could have believed that they are as good as males and so, the stereotype might not have activated as they did not have any inferiority in this regard. It is possible that the females were motivated enough to solve the test and to disprove the stereotype. The personality factors could also have played a role and so could the past experiences related to the subject of mathematics where they never faced any problem or issue relating to the subject. Another reason of getting insignificant results is that perhaps the stereotype threat given was very subtle which did not lead to activation of the

threat, which is also a limitation of the study. Also, it is possible that the women in the stereotype threat condition did not identify with the threat and/or relate to the threat itself.

The result in the no stereotype threat condition was also insignificant showing that there was not any significant difference between the performance of males and females. This is because there was no stereotype threat given to this group. A research by [7] applied a social identity perspective to situations of stereotype threat. It was hypothesized that individuals would be more susceptible to the performance-inhibiting effects of stereotype threat to the extent that they are highly identified with the group to which a negative stereotype applies. A quasi-experimental study with male and female college students revealed that individual differences in gender identification (i.e., importance placed on gender identity) moderated the effects of gender identity relevance on women's (but not men's) math performance. When their gender identity was linked to their performance on a math test, women with higher levels of gender identification performed worse than men, but women with lower levels of gender identification performed equally to men. When gender identity was not linked to test performance, women performed equally to men regardless of the importance they placed on gender identity.

The t test was done for males of both conditions and females of both conditions too. For males of stereotype and no stereotype threat condition (Table 4), the t value obtained was -0.77 at p value 0.22 which is insignificant as $p > 0.05$. This is because there are no major mean differences between the two groups (24.85 and 26.25 for stereotype and no stereotype threat condition respectively). This shows that the performance of males was similar in both the conditions.

For females in both the conditions (Table 5), the t value obtained was -1.17 at p value 0.12 which is insignificant as $p > 0.05$. This is because there was no major mean difference between the two groups (22.35 and 24.58 for stereotype and no stereotype threat condition, respectively). This shows that the performance of females was similar in both the conditions.

It is possible that in the stereotype threat condition the males experienced a boost and hence they were high on motivation. The belief that their group is superior to females in the particular field, led them to perform well in the test. Whereas, in the no stereotype threat condition the males perhaps did not experience any boost. Alternatively, perhaps the threat did not activate in the females in the stereotype threat condition. Therefore, there wasn't any significant difference between the performances of males in the two conditions. The participants were from varied backgrounds and cultures, and so it is possible that the threat is not prevalent in their culture at all and so they haven't been exposed to it and don't believe in it. This again, could result in females in both the conditions not having any significant difference in their performance. Designed 2 studies to explore the impact of self-affirmation under stereotype threat on performance of women [5]. In one study, when the test was described as diagnostic of intelligence in mathematics, women performed worse as compared to non-diagnostic scenario. On other hand, when women asserted a valued attribute under stereotype threat condition, their performance was comparable to men and women under control condition. Women and men performed on spatial rotation test under other study and the stereotype that women are inferior in such tasks was made evident. Self-affirmation was done by almost half men and women before the test began. This improved the women's performance under threat condition.

To check means and ways of helping women overcome the anxiety-generating effects of stereotype threat, and thus increase their test performance, a field experiment was done by [3]. College students mentored 7th grade students in experimental conditions. They encouraged the students to look at intelligence as adaptable or malleable or ascribe the problems in 7th grade to educational setting. It was seen that females got significantly better and higher marks in both the conditions compared to those in control setting.

CONCLUSION

The objective of the present research was to study stereotype threat as a mean of intercultural contact among target audience i.e. college going females on their mathematical ability. On pooling the data ($n=50$), the hypothesis that females will perform poorly in comparison to males on the numerical ability test upon activating the stereotype 'women are poor in numerical ability' in stereotype threat condition did not get proved. The results between the males and females in stereotype and no stereotype threat condition and between males and between females in both conditions were insignificant.

The limitations of the study are that the research was not done in a lab setting but a field setting. The data was not homogenous, and all participants were not from Delhi but from various backgrounds and cultures. Perhaps there were participants from cultures where such a threat is not explicit. The sampling too was convenience sampling and thus not representative of the population and results cannot be generalized. The sample size was not large enough. The extraneous variables could have affected the performance. The statistical technique and tools applied can be more varied with a larger mix of multi-cultural sample for

future research in this direction. The study can be expanded also by taking participants from different age groups.

REFERENCES

- [1] C.Y. Chiu, Y.Y. Hong. *Social Psychology of Culture*. New York: Routledge; 2013.
- [2] C. Good, J. Aronson, J.A. Harder. Problems in the pipeline: stereotype threat and women's achievement in high level math courses, *J Appl Dev Psychol*. 2008; 29(1): 17–28p.
- [3] C. Good, J. Aronson, M. Inzlicht. Improving adolescents' standardized test performance: an intervention to reduce the effects of stereotype threat, *J Appl Dev Psychol*. 2003; 24(6): 645–62p.
- [4] M. Inzlicht, T.B. Zeev. A threatening intellectual environment: why females are susceptible to experiencing problem-solving deficits in the presence of males, *Psychol Sci*. 2000; 11(5): 365–71p.
- [5] A. Martens, M. Johns, J. Greenberg, et al. Combating stereotype threat: the effect of self-affirmation on women's intellectual performance, *J Exp Soc Psychol*. 2006; 42(2): 236–43p.
- [6] S.J. Spencer, C.M. Steele, D.M. Quinn. Stereotype threat and women's math performance, *J Exp Soc Psychol*. 1999; 35(1): 4–28p.
- [7] T. Schmader. Gender identification moderates stereotype threat effects on women's math performance, *J Exp Soc Psychol*. 2002; 38(2): 194–201p.