



From Social Condition to Cognitive Compromise: Stereotype threat and Memory Relation

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Abstract

In today's era, it has been observed that how stereotype has made its place not only in books but also in thoughts, behaviours, actions of human being and in each and every little spheres of their lives. Stereotype threat affects the performance of an individuals because their thoughts, beliefs and action become stigmatized towards a particular group or an idea. The aim of presenting this review paper is to fall a light on the work of retrieval processes of memory stores and that stereotype threat affects the memory leading to deterioration of performance of an individual by reducing the attention during learning and monitoring at retrieval by disrupting the controlled processes. It not only increases anxiety but also reduces expectation by taking away necessary cognitive resources from already cognitively demanding task. The executive control interference account predicts that stereotype threat decreases the availability of executive control resources and hence impairs the working memory performance. The regulatory fit account predicts that threat induces a prevention focus, impairing the performance. However, stereotype threat affects diverse social groups in different ways with no one mediator providing unequivocal supports. The review paper also highlights that how just by the mere activation of stereotype memory performance is affected and its efficiency is reduced.

Key Words: Stereotype Threat, Social Condition, Performance, Memory

For decades, people face prejudices and discrimination regarding their age, class, ethnicity, race, gender, etc. Due to such marginalization, people are divided into several groups. Our identity is shaped by these social classes or groups and all the social classes or groups are characterized by membership criteria and boundaries. They include or exclude people according to their subjective boundaries. Despite the fact that these boundaries do not necessarily imply any tension between groups, the relationship between groups is more likely to be antagonistic than complementary. Stereotype threat is a circumstantial predicament in which individuals are at the risk of confirming negative beliefs about their stigmatized status or group. The negative belief thus formed activate the stereotype thus producing a reliable interference

resulting in impairing performance. This impairment is because stereotype threat tends to take away necessary cognitive resources from already cognitively demanding task hence, imposing a cognitive burden thus affecting the performance of an individual or a group. In this regard researcher extensively tries to collect and analyse those variables systematically.

Across the variety of time and place people have faced negative stereotype about their group's ability and belongingness in the society. These people cognize that the members of their group have faced prejudice and discrimination because, they may have encountered these themselves, they may worry they could be judged and treated stereotypically. (Steele, Spencer & Aronson, 2002). The psychological, emotional and

pragmatic cost of committing an endeavour and relationship assuming fair treatment, can be doubly troubling. Along with the loss of time and energy, there is also a feeling of being underestimated, for this reason, in school and work setting in the United State ethnic minorities may take into consideration the hypothesis that they could be stereotyped until they have provided evidence to the contrary. (women in math and science may concern similar concern (Davies, Spencer and Quinn and Gerhardstein, 2002). When people find themselves in a situation where negative stereotyping provides a possible framework to explain their behaviour, the risk of being confirming of those stereotypes may impede their performance and aspirations in that domain may infuse the detrimental state. This situational prediction, called stereotype threat, is the subject of intense debate and research in educational, social, and organizational psychology. When viewed through the lens of stereotype, "stereotype threat" can increase stress, deplete mental resources and undermine performance and lower their aspirations (Davies et.al, 2002), However, inequality can also arise from differences in people's perception, their constructive construal's (Ross and Nisbett,1991).

Stereotype Threat and Performance

People use ideas and beliefs, to justify the social world around them. Stereotyped members of disadvantage group justify the inequality in this way. Katz and Braly (1933), Jackman and Senter (1983) provided survey data and concluded that ideological value and stereotypes were relatively consensual and favoured of dominant groups interest across racial and gender contexts. Ridgeway (2001) concluded that people form status beliefs in the course of face-to-face interaction in such a way that structural inequalities tend to be legitimized and be responsible. In all the research papers indicate that stereotypes operate as ideological devices to justify inequalities between groups. Steele (1997) considered that the degree of stereotype threat effect may vary depending on the relevance of the stereotype in the test setting. For example, Shih, Pittinsky, and Ambady (1999) found that, when confronting a stereotype threat-loaded situation (i.e., taking a math test), Asian American women attended solve more correct problems when the situational cues about their "Asian" identity were accessible rather than when their "woman" identity was made salient (mean differences weren't statistically significant). However, Researchers can activate stereotype threat by manipulating the extent to which a stereotype is contextualized by examining candidates to link between a stereotype test and a

particular assessment test (i.e., the activation of the underlying stereotype threat or by declaring that). A context test is predominant for individuals in terms of context. Members of a social group perform worse in the test than the comparison group.

Domain Identification Stereotype threat theory proposes that only those who strongly identify themselves with a domain with which there is a negative group stereotype are susceptible to the threat of confirming the group-based stigma because the strength of stereotype threat effects depends on "the degree to which one's self-regard, or some component of it, depends on the outcomes one experiences in the domain" (Steele et al., 2002). For example, only women who identify with math would experience stereotype threat while taking a math test (Cadinu et al., 2003). The available evidence indicates that the salience of a negative stereotype in a performance context is capable of engendering a threat to self-worth that may consume the very psychological resources people need to overcome the negative characterization.

If we want to understand the dilution mechanisms of performance, then we first have to consider the process by which situational cues trigger stereotype threat. In our view, all situations of stereotype threat involve activation of three core concepts: the concept of one's in-group, the concept of the ability domain in question, and the self-concept. However, it is not merely the activation of these three concepts but the activated propositional relation (Gawronski & Bodenhausen, 2006) between them that we believe underlies the experience of stereotype threat. A positive entity relationship means that the two concepts are defined in relation to each other in that context (my group has this ability; I like my group; I have this ability). Conversely, a negative link between either of these concepts indicate that, one concept is defined as opposed to another (my group does not have this ability; I am not like my group; I don't have the ability). Similar to the framework formulated by Balance Theory and Nosek, Banaji, and Greenwald (2002), we perceive stereotype threat as stems from a situation driven by an imbalance between these stereotyped links, which motivate individual to struggles for solutions, (my group does not have this ability, I am like my group, but I think I have this ability). An earlier study has shown an imbalance between these three components created by the presence of situational primes and/or individual-differences variables in stereotype threat situations that increase vulnerability to threat.

When people faced with a negative stereotype about an important social identity, targeted individuals actively defend themselves against negative labels (Crocker, Major, & Steele, 1998). However, previous researches suggest that defending against being negatively stereotyped can lead to behaviour that confirms the validity of the negative belief. Stereotype threat theory predicts that when negative stereotypes about a group become salient as a criterion of performance evaluation, individual group members may be concerned that their performance would confirm the validity of the negative stereotype (Steele, 1997; Steele & Aronson, 1995). This incrementing thought of getting validated about this negative stereotype adds on a psychological burden on such individual which in turn decreases their potential expectancies and therefore their performance. Similar postulations were signified by the study of Steele and Aronson (1995) who found that mere framing of a test which was diagnosing innate intelligence of the people resulted in poorer performance among the Black participants as to when compared on a non-stereotype related dimension. Similarly, Spencer, Steele, and Quinn (1999) reported that when performance on a standardized math test was linked to gender differences in math, female participants performed more poorly than when the same test was framed as not showing gender differences in performance. Evidence suggests that poor performance in stereotype-threat situations is partly due to thinking about race and self-doubt, inefficient information processing (Ceryan & Bodenhausen, 2000), or feelings of anxiety (Spencer et al., 1999).

The early hypothesis of the stereotype threat theory is performance interference, or predictions that stereotyped people perform badly on an evaluative task (e.g., African Americans taking a verbal ability test or women taking a mathematics test) in a stereotype-threatening context than in a nonthreatening condition (Steele, 1997; Steele et al., 2002). The mean performance of the condition is compared and the members of a stereotyped group are randomly assigned to control or threat condition in a fundamental experimental paradigm. Researchers have also occasionally included a comparison group from which the induced negative stereotype is not relevant (white, male). Steele and Aronson (1995; Experiment 1) allocated the African American students with a stereotype threat condition out of the three conditions by giving them a difficult verbal ability test of an experimental study where the participant was informed that was a detector of their intellectual ability. The commonality in rest situation was that the test was reported as a task of

problem solving or no distinct instruction were made. In the observed condition, the participants tend to be supporting the hypothesis of a performance intercession by correctly solving fewer test problems than that in case supplementary condition. The effect of replication was turned up by many latter researchers. They hold forth stereotype threat to Hispanic or African American test taker for cognitive ability test (Cadinu, Maas, Frigorio, Impagliazzo, & Latinotti, 2003; Dodge, Williams, & Blanton, 2001) and female math ability tests (Davis, Spencer, Quinn, & Gerheadstein, 2002; Schmader and Johns, 2003; Spencer, Steele, & Quinn, 1999). Some researcher did not hold up with the performance interference hypothesis (McFarland, Kemp, Veera, & Odin, 2003; Oswald & Harvey, 2000–2001; Schneeberger & Williams, 2003; Streaker & Ward, 2004). Stereotype relevance, domain identification, and test difficulty are the three types of mediator as put forward by stereotype threat theory. Mixed findings propose the mediating effect for stereotype threat.

With increase in number of researches, it has been investigated that how the performance of stereotyped group members decreases on activation of negative stereotype. (For review, see the work of Steele, Spencer and Aronson, 2002). It is a psychological circumstance that causes an individual to believe that their performance may be assessed in consideration of negative stereotype of their group. In such circumstances, if the stereotype of one group is confirmed then it adds load causing to subsequently erode an individual's performance. On activation of stereotype about intellectual inferiority of African-American, Steele and Aronson (1995) probe that in an intellectual test white student performed better than the black students. In contrast to explanation focusing on genetic, socialization or educational resource differences, all the types of stereotype threat research advise that within the performance situation variables can manage to obtain distinctions among a variety of differentiated groups (Steele et al., 2002). Social identity is affected by stereotype threat, social identity not only determine sensitivity to stereotype threat but is also a result of that. We find that people get inspired by stereotype threat to change their sense of self.

Memory

Encoding, storage and retrieval are the three major processes that can be used to test the memory. When a person fails to retrieve information and find himself impotent to recall the encoded content this is because of the fact that either the encoding was

not properly done or the information was not properly stored. According to the researcher, (Nyberg, Cabeza, & Tulving, 1996; Tulving, Kapur, Craik, Moscovitz, & Houle, 1994) information can be encoded and retrieved through definite processes from the memory. But it is still a matter of investigation whether stereotype threat diminishes memory by disrupting encoding or retrieval processes. The effect of stereotype threat or older adults' memory as assessed by different studies have inaugurated stereotype threat earlier to encoding, and found that it is linked with subsequent memory (Hess et al., 2004; Chasteen et al., 2005; Hayes, Emery, & Queen, 2009;). It is found out through study that threat active earlier to encoding may disturbed the encoding processes as well as disrupted the retrieval processes. This is done in order to recognise the mechanism in which memory performance is damaged due to threat. The effects of threats for encoding phase cannot be detached.

Stereotype threat can impair memory performance in many different ways. It may reduce attention during learning and monitoring at retrieval by disrupting controlled processes. Prior research examined the mechanism by which stereotype threat disrupt memory performance of older adult people. For example, Hayes and colleagues (2003) in their research they found that stereotype threat impeded the performance, and this effect increased when older adults were overly invested in their memory ability. As stated by the researchers, increase anxiety or reduced expectation is activated by stereotype threat.

Emerging theories propose that during the task older adults' motivation and mindset can be transferred causing the controlled processes to be intervened by stereotype threat (Barber & Mather, 2013; 2014), but according to Hess, Emery and Queen (2009), during a short time memory task the older adults' recall denied in making responses. These researchers also found that stereotype threat can impede retrieval under a time constraint because this quick decision-making locations increased the demand for processing resources. Thus, stereotype threat may take away the necessary cognitive resources from an already cognitively demanding task, which will result in reduced the performance. In a subsequent test, false alarm towards lure items increases if the stereotype threat is given before the retrieval Thomas and DuBois (2011). This is because false memory is connected with failures in monitoring (Kelly & Sahakian, 2003; Roediger & McDermott, 1995). Thomas and Dubois (2011) findings in their studies advocate that memories are affected by

stereotype threat by impeding the controlled processes.

Advised by the recent research, complex intellectual tasks at most requirement is the ability of combining the information processing which may be ignored on reducing working memory resources as a result of the effect of stereotype threat as it can foist of cognitive burden. Croizet, Despres, Gauzins, Huguet, Leyens and Meot's (2004). Schmader & Johns_(2003) argue that the stereotype threat tampers with execution by reducing the working memory capacity that individual needs to accomplish a task effectively. STM is involved in the control, regulation, active maintenance of a limited amount of information with relevant to task at hand, if the capacity of the working memory system in order to seek task relevant information is hampered, the performance of the individual might suffer. Schmader and Johns (2003) investigated the relationship between the working memory and stereotype threat by triggering or activating negative self-stereotype in women sample which underlined the differences between the genders in their quantitative ability and then measured the working memory capacity of the stereotyped group members. Due to the consumption of cognitive resources by the stereotype-related thoughts the performance evaluative situation decreases the capacity of working memory. They investigated whether the impact of Latino American's mathematical ability and of a group as a target set on women's and the result was that in comparison to non-threat control condition those Latino American and female partaker settled fewer mathematical problem and detrimental effect of stereotype threat was seen on the math performance completed to an operation span task.

The deficits in working memory due to exposure to stereotype threat has the tendency of carrying it over to other smaller tasks which may not be related but demands some cognitive performance as required by the task performed under that stereotype threat. Trbovich and Lefevre (2003) through an example stated that one's phonological load is directly proportional to latency in answering mental arithmetic problems. Increasing phonological load through memorizing consonant-vowel-consonant non-words thus leads to rised latency in answer in mathematical problems. Inspired from Trbovich and Lefevre (2003), Beilock, Rydell, and McConnell (2007) presented the female participant to complete a high working memory math test in presence of stereotype threat.

Adding to this, in contrast to the construct of working memory, the executive functioning is formed from additional cognition processes. Then predictions were made by Rydell et al. (2007) admitting to it that stereotype threat effects conciliate updating that it is one's ability to store and upgrade information in face of interference and according to them shifting (the capacity to transit between task) and inhibition (capacity to impede a dominant response) should not buttress this effect. In comparison to controlled condition the women who experienced explicit group as target threat showed declined in mathematical performance. Supporting the assumption, stereotype threat performance relationship is conciliated only by updating, thus the negative stereotype along with verbal cogitation may interfere women's ability to retain and upgrade the calculation needed to solve difficult math problems.

Implication

Our review and meta-analysis shed a light on the work of the retrieval processes of Short term memory and Long term memory including an important role of stereotypes on the Indian caste system. The results from studies employing other group-based stereotypes (ex. associated with ageism, social class system, women, ethnic minorities, study majors) an /or measuring other domain of abilities (work related abilities, working memory capacity) were cumulated in the present review. As our meta-analytic findings demonstrate, even subtle ques, like asking negatively stereotyped immigrant students about their ethnic background prior to a task, can decrease performance to the same extent as blatant ques, such as stating the cognitive inferiority of a group. Immigrants achievement gap could be one important key to societies future prosperity, thus applying certain strategies could reduce the detrimental effects of stereotype threat. (ex., Purdie-Vaughns et.al., 2008; Carrell et.al., 2010.

Our work not only demonstrates the value of examining underlying process as a means to gain a fuller theoretical understanding of stereotype threat but also provides an important theoretical bridge between work on stereotype threat. Most of the research papers have done their work on older adult's memory performance but our paper has not only focused on younger adult's memory performance but also it has highlighted the effects of stereotype threat in multiple aspects of an individual's life. (e.g., Steele, 1997; Steele et al., 2002; Wheeler & Petty, 2001) and research in cognitive psychology exploring test anxiety (e.g., Ashcraft & Kirk, 2001; Eysenck & Calvo, 1992)

and performance pressure (Beilock & Carr, 2001; Beilock et al., 2004).

To this end, future work is likely to benefit from the following directions: First, account for the existence of multiple stereotype threats; Second, recognize that the experiences of stereotype threat may differ between stigmatized groups, and that no one mediator may provide generalized empirical support across diverse populations; Third, utilize indirect measures, in addition to self-report measures, to examine reliably mediating variables and to examine further the convergence of these two methods; Fourth, counterbalance test instruments to control for order effects.

Whether the stereotype threat affects the processes of memory retrieval in a threatening situation and what psychological processes are involved in activation of stereotype threat and how well being diversity and increased literacy could reduce the stereotype threat effects.? Does memory play an important role in performance decrement and if it does then at what stage- encoding or retrieval and how retrieval impacts the mediation process?. These two research question remains to be explored in future studies.

Conclusion

Hence, by all count and proven results it is no wonder that stereotype threat affects the individuals or group of individuals in any society and culture. Various factors have been implicated in stereotype threat, including individual difference variables (e.g., age, race, gender and socio-economic status) as well as threat type (e.g., innate ability stereotype threat and effect stereotype threat). This context will be extended to certain social categories of the group in Indian context. In India there are three major category that is, based on social economical hierarchy. These categories bear some specific stereotype related to their category that have primarily social bases. Through our research study,

it has been assessed that stereotype threat consequently leads to deterioration in performance level of an individuals or group of individuals. The mere activation of stereotypes in the test situation seems sufficient to produce a reliable interference, resulting in greatly reduced performance. The reduction in performance is because the stereotype threat may take away the necessary cognitive resources from already cognitively demanding task. Stereotype threat can impose a cognitive burden as discussed by Croized, Destres, Guizins, Hugues, Leynes and Neot's (2004), and most of the

research based on stereotype threat and memory is done on older adults. Memory can detect through three major processes encoding, storage and retrieval but it is sensory memory, short term memory and long-term memory.

Many researches have been conducted showing their work on memory along with stereotype threat but these research does not present their work in the field of Long-term memory that further distinguishes into Episodic

and Semantic memory. Our study falls a light on the work of retrieval process of Short-term memory and long-term memory (Episodic and Semantic Memory). This may be due to the stereotype that a person is unable to retrieve information, despite the fact it was encoded from memory. Stereotype threat impair memory by disrupting encoding and retrieval processes. It still remains a question whether the stereotype threat affect the processes of memory retrieval in a threatening situation?

Reference

- Aronson, J., Lustina, M. J., Good, C., Keough, K., Steele, C. M., & Brown, J. (1999). When white men can't do math: Necessary and sufficient factors in stereotype threat. *Journal of experimental social psychology*, 35(1), 29-46.
- Barber, S. J., & Mather, M. (2013). Stereotype threat can both enhance and impair older adults' memory. *Psychological science*, 24(12), 2522-2529.
- Beilock, S. L., Rydell, R. J., & McConnell, A. R. (2007). Stereotype threat and working memory: mechanisms, alleviation, and spillover. *Journal of Experimental Psychology: General*, 136(2), 256.
- Cadinu, M., Maass, A., Frigerio, S., Impagliazzo, L., & Latinotti, S. (2003). Stereotype threat: The effect of expectancy on performance. *European journal of social psychology*, 33(2), 267-285.
- Ceryan, S. , & Bodenhausen, G. V. (2000). When positive stereotypes threaten intellectual performance: The psychological hazards of "model minority" status. *Psychological Science*, 11, 399-402.
- Chasteen, A. L., Bhattacharyya, S., Horhota, M., Tam, R., & Hasher, L. (2005). How feelings of stereotype threat influence older adults' memory performance. *Experimental aging research*, 31(3), 235-260.
- Crocker, J., Major, B., & Steele, CM . (1998). Social stigma. In D. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., Vol. 2, pp. 504-553). Boston: McGraw-Hill.
- Davies, P. G., Spencer, S. J., Quinn, D. M., & Gerhardstein, R. (2002). Consuming images: How television commercials that elicit stereotype threat can restrain women academically and professionally. *Personality and Social Psychology Bulletin*, 28(12), 1615-1628.
- Dodge, T. L., Williams, K. J., & Blanton, H. (2001, April). Motivational mediators of the stereotype threat effect. In *16th annual conference for the Society of Industrial and Organizational Psychology*, San Diego, CA.
- Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: an integrative review of implicit and explicit attitude change. *Psychological bulletin*, 132(5), 692.
- Hess, T. M., Emery, L., & Queen, T. L. (2009). Task demands moderate stereotype threat effects on memory performance. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 64(4), 482-486.
- Inzlicht, M., & Ben-Zeev, T. (2000). A threatening intellectual environment: Why females are susceptible to experiencing problem-solving deficits in the presence of males. *Psychological Science*, 11(5), 365-371.
- Jackman, Mary R., and Mary Scheuer Senter. 1983. "Different, Therefore Unequal: Beliefs about Trait Differences between Groups of Unequal Status." *Research in Social Stratification and Mobility* 2:309-35
- Katz, D., & Braly, K. (1933). Racial stereotypes of one hundred college students. *The Journal of Abnormal and Social Psychology*, 28(3), 280.
- Leyens, J. P., Désert, M., Croizet, J. C., & Darcis, C. (2000). Stereotype threat: Are lower status and history of stigmatization preconditions of stereotype threat?. *Personality and Social Psychology Bulletin*, 26(10), 1189-1199.

- McFarland, L. A., Lev-Arey, D. M., & Ziegert, J. C. (2003). An examination of stereotype threat in a motivational context. *Human Performance*, 16(3), 181-205.
- Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Harvesting implicit group attitudes and beliefs from a demonstration web site. *Group Dynamics: Theory, Research, and Practice*, 6(1), 101.
- Nyberg, L., Cabeza, R., & Tulving, E. (1996). PET studies of encoding and retrieval: The HERA model. *Psychonomic Bulletin & Review*, 3(2), 135-148.
- Oswald, D. L., & Harvey, R. D. (2000). Hostile environments, stereotype threat, and math performance among undergraduate women. *Current Psychology*, 19(4), 338-356.
- Ridgeway, C. L. (2001). The emergence of status beliefs: From structural inequality to legitimizing ideology.
- Schmader, T. (2002). Gender identification moderates stereotype threat effects on women's math performance. *Journal of Experimental Social Psychology*, 38(2), 194-201.
- Schmader, T., & Johns, M. (2003). Converging evidence that stereotype threat reduces working memory capacity. *Journal of personality and social psychology*, 85(3), 440.
- Schmader, T., Johns, M., & Barquissau, M. (2004). The costs of accepting gender differences: The role of stereotype endorsement in women's experience in the math domain. *Sex roles*, 50(11), 835-850.
- Schneeberger, N. A., & Williams, K. (2003). Why women “can't” do math: The role of cognitive load in stereotype threat research. In *18th meeting of the Society for Industrial and Organizational Psychology, Orlando, FL*.
- Shih M, Pittinsky TL, Ambadi N. 1999. Stereotype susceptibility: identity salience and shifts in quantitative performance. *Psychol. Sci.* 10:80–83
- Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of experimental social psychology*, 35(1), 4-28.
- Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American psychologist*, 52(6), 613.
- Steele, C. M., & Aaronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69(5), 797–811.
- Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. In *Advances in experimental social psychology* (Vol. 34, pp. 379-440). Academic Press.
- Trbovich, P. L., & LeFevre, J. A. (2003). Phonological and visual working memory in mental addition. *Memory & Cognition*, 31(5), 738-745.
- Tulving, E., Markowitsch, H. J., Kapur, S., Habib, R., & Houle, S. (1994). Novelty encoding networks in the human brain: Positron emission tomography data. *Neuroreport*, 5, 2525-2528.