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Dissecting culture at work: Conversation with Indian immigrant scientists & engineers in the US industrial sector

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ABSTRACT

Scientists and engineers' social background, cultural upbringing, educational training, and world outlook influence how they perform the work and interact with their colleagues. We conducted a study on Indian immigrant scientists and engineers employed in the US industrial sector. We interviewed 40 Indian immigrant scientists and engineers, some of whom came for higher studies and found employment after graduation, while others came directly from India to work. Findings show that the overwhelming majority of interviewees (n = 35) noted significant cultural differences with their colleagues in the workplace; only a small number of interviewees (n = 5), believed that their foundation in professionalism eliminated significant impacts from cultural dissimilarities. Interviewees identified cultural differences in the areas of social interactions, work-related practices, intercultural communication, and management. When immigrant scientists and engineers from developing countries join industrial organizations, they do not leave their cultural practices at home. A conversation with Indian immigrant scientists and engineers shows how Indian culture manifests itself in the workplace.

1. Introduction

Do immigrants steal jobs from US-born workers? With low-skill immigrants from developing countries, debates are rather antagonistic as reflected in US President Donald Trump's 2016 campaign slogan: 'I will build a great great wall on our southern border and I'll have Mexico pay for that wall' [26]. With high-skill immigrants from developing countries, debates have become emotional. It is partially because Americans may not want to be employed in low skill jobs, which is not the case with high skill jobs. At the same time, high-skill migration has become important to the US economy. *The State of U.S. Science & Engineering* reports the increasing dependence of the US science and engineering (S&E) workforce on foreign-born scientists and engineers [24]. A large majority of foreign-born scientists and engineers in the US workforce are from Asian countries.

Asians are educated in modern S&E, and with such knowledge, they are easily transferable from their home country to the United States [23,27]. They are also expected to possess the cultural characteristics of the country where they were born and raised. However, the cultural dissimilarities of Asian immigrants in the US are not seen as having any significant impact on S&E activities as such. It is mostly because the dominant premise of S&E is that they are produced solely according to rational and cognitive factors, which are independent of the social and cultural backgrounds of scientists and engineers.

In 1942, Robert Merton [22] identified CUDO or four social norms of science: (i) communality, that is, the substantive findings of science are the property of the scientific community and not of individual contributors; (ii) universalism, that is, scientific contributions are evaluated in a purely impersonal, objective fashion; (iii) disinterestedness, that is, science is pursued for its own sake and not for personal gain; and (iv) organized skepticism, that is, scientists scrutinize the findings of other scientists, including those on which they base their own work. Merton argued that science is a self-regulating, rational process. Within the Mertonian paradigm, professionalism has been the main way to understand scientists' and engineers' attitudes and practices. Although there has been dissension among scholars over professionalism, the term remains popular [36]. Elliot Friedson [6] has viewed professionalism as a folk concept whereas, Andrew Abbotts [1] has portrayed it as an honorific term. It has been argued that professionalism—typically understood as a combination of knowledge, skills, trustworthiness, and altruism—is more relevant today than in the past [3]. Within the professionalism model, the production of S&E knowledge is seen independently of social and cultural factors. If such factors enter S&E discourse, they are viewed as creating a bias, thus must be eliminated.

Since 1980, scholars have shown how social and cultural factors shape S&E activities [11]. For instance, David Dickson [4] argued that

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the scientific community has its own internal power structures, its elites, its hierarchies, its ideologies, its sanctioned norms of social behavior, and its dissenting groups. David Noble [25] proposed that industrial automation is a social process that reflects the real division between workers and management, thus it cannot be just understood merely as a technological advance. David Mackenzie [20] examined the growth of modern statistical methods and eugenic ideology in England to argue that the development of scientific theories reflects social interests prevalent in society. Sharon Traweek [35] showed that the scientific culture of particle physicists in the United States differs significantly from that in Japan, and thus it cannot be a single unified category.

Many prominent scholars have proposed that modern science itself is constructed socially. For instance, Bruno Latour [19] examined the conditions under which scientific knowledge originates and is accepted by the scientific community to argue that modern science is a social and linguistic construct. Karin Knorr-Cetina [16] has argued that the epistemic culture in science is marked by a loss of empirical, and scientists use different scientific methods to their advantage. Feminist scholars have shown how scientific knowledge itself is gendered [10]. For instance, Evelyn Fox Keller [14] has shown a parallel between scientific and masculine traits such as objectivity and reasoning; in contrast, unscientific traits such as subjectivity and feelings are portrayed as feminine traits. Social constructionists see non-Western societies as having different senses of scientific logic, which can diverge radically from the logic of the modern science of West [9]. Non-western societies are seen to have their own ethno-science (the system of knowledge that is typical in a given culture). Though there is a growing body of literature on the social and cultural dimensions of S&E practice, studies on S&E cultures of Asian immigrants in the US workforce are limited.

When scholars have studied Asian immigrant scientists and engineers, the focus has been on the brain drain, whereby developing countries lose their best and brightest to the developed countries [7,21]. However, offsetting the brain drain is brain circulation, as skilled immigrants from developing countries, after graduate study and work in developed countries, return to their home country [31,40]. Instead of immigration patterns, some scholars have focused on the glass ceiling among Asian Americans—artificial barriers that prevent qualified individuals from advancing to top management-level positions within organizations [30,34,37,38,43,44]. Counteracting glass ceiling is the emergence of Asian immigrant entrepreneurs [32,39,41,42].

This paper examines how culture brought by Indian immigrant scientists and engineers manifests itself in the US workplace. It focuses on Indian because of their overwhelming presence in the US S&E sector. In 2017, India accounted for 23% of the foreign-born S&E degree holders in the US; of foreign-born holding S&E doctorates, 15% of them were from India [24]. Moreover, the higher the degree level, the greater is the proportion of the S&E workforce who are India-born. Some of these India-born are long-term residents with either a US citizenship or a permanent immigration card, whereas others are short-term US residents with temporary specialty work visas commonly known as H–1B. With their number and educational characteristics, India-born scientists and engineers occupy a unique place in the US high-technology sector. This paper studies how Indian immigrant scientists' and engineers' cultural norms impact the work they do and how they interact with their American colleagues. This way, it addresses some key aspects of the S&E activities as seen by a neglected group. The paper is based on in-depth interviews conducted with 40 Indian immigrant scientists and engineers employed in the US technology sector. Details on the methodology employed are outlined later in the paper.

2. Scholarly view

Rudyard Kipling in his famous 1889 poem 'The Ballad of East and West' stated that 'East is East, and West is West, and never the twain shall meet' [2]. There is hardly any disagreement that Western and Eastern countries differ significantly in their histories, politics, economies, and social-cultural lifestyles. During colonialism, such social and cultural differences between the Western and Eastern countries were perceived as what Edward Said called *Orientalism* over 40 years ago [29]. According to Said's thesis, orientalism is a way of seeing and emphasizing Eastern people and culture as exotic, backward and inferior as compared to that of Western people. In the era of colonialism, it provided a rationalization for the Western occupation of the Orient.

In the post-colonial era, orientalism became assimilating Eastern migrants into superior Western values, so they resemble the dominant Western culture. Eastern migrants' presence in the United States was framed as the Oriental problem. The classic presentation of assimilation is contained in Milton Gordon's *Assimilation and American Life* [8]. The melting pot is a metaphor for American society with diverse cultures gradually developing a sense of identity oriented exclusively around American values. In the late 1980s, multiculturalism began to question the desirability of assimilation, and instead proposed the co-existence of diverse cultures in American society. Now the emphasis is on the mix of people belonging to diverse cultures co-existing within the American core society. In multicultural America, Eastern migrants can retain and celebrate their unique cultural ways of life as noted in Christopher Lasch's book entitled, *The Culture of Narcissism* [18]. It should be noted that a support of multiculturalism has not led to reducing racism, ethnocentrism, discrimination, and biases. The Black Lives Matter—a social movement which began in 2013 to protest against incidents of police brutality and violence against blacks—shows that multiculturalism has made little difference to black people's lives.

Multiculturalism addresses the presence of eastern (and other) ethnic groups within the American society. The question, however, remains how multiculturalism is manifested in the US workplace. Working style is the way one goes about daily tasks on the job. Typically, employees have their own working styles, which they think is the best way to perform the work. In the industrial sector, employees may work alone if they are solving a technical problem, or they may be a part of a group if they are building a product. If they work alone, they may be self-disciplined; however, if they work in a group, they may share responsibilities. It is possible, on some tasks they may work alone whereas on other tasks they may work in a group. Even when employees work alone on some projects, they may still have connections with their colleagues.

With the increasing presence of skilled foreign-born, working styles have been identified within the framework of national cultures. In his seminal work *Culture's Consequences: International Differences in Work-Related Values,* Geert Hofstede [12] reported findings from his attitude surveys of employees from 40 countries working in International Business Machines (IBM) corporation between 1967 and 1973. For him, 'culture is the collective programming of the mind distinguishing the members of one group or category of people from others' [13]. Hofstede identified four dimensions on which employees from different national cultures differ:

1. Power distance dimension is the extent to which members of a culture accept the unequal distribution and inequality of power. In this dimension, the basic issue is the relationship between employees of different status. When employees are from societies, which have a large degree of power distance, they accept a hierarchical order in which everybody has an assigned place and role; in contrast, employees from societies with low power distance, attempt to equalize the distribution of power.
2. Individualism versus collectivism is the second dimension of national cultures at work. Individualism is a preference for a loosely-knit social framework in which employees are mostly expected to take care of themselves; in contrast, collectivism is a preference for a tightly-knit framework in which employees can expect others to look after them. Basically, individualism focuses on independence and

values privacy; collectivism is about interdependence and being a part of a group.
3. Masculinity versus femininity is society's preference for being more competitive than being consensus-oriented.
4. Uncertainty avoidance dimension expresses the degree to which people in a given society feel uncomfortable with uncertainty and ambiguity.

Hofstede's cultural dimensions have been used worldwide to study national cultures in the workplace. Lionel Laroche [17] has built on the Hofstede's cultural dimensions to examine the context of technical professionals. He has proposed that the relationships between managers and technical professionals become more challenging when they come from different cultural backgrounds because they have different concepts of what being a manager or a technical professional means. According to him, major invisible cultural norms from manager's perspectives about eastern technical professionals are lack of initiative, deference towards managers, and defensiveness; eastern technical professionals, on the other hand, view managers to be technically incompetent who put them on the spot.

Effective communication in the workplace is considered an integral part of organizations' success. Typically, communication is understood as the process of sending and receiving messages. Wilbur Schramm, who is considered the father of Communication Studies has broken it into several parts, such as the sender, receiver, message, sender's interpretation of the message, and receiver's interpretation of the message [28]. There is a context of the message, which is what people expect from each other. It is important that communications generate the desired results at work for the wellbeing of the business. Intercultural communication focuses on communication across people belonging to different cultures and countries. It assumes that culture determines how people translate messages, the medium they select for sending messages, and the way they interpret messages. Intercultural communication, therefore, goes beyond language proficiency in one's country.

There are at least two aspects of intercultural communication between Eastern and Western people, which are situated in their specific cultures [15,17]. First, under the western system, people are considered free to say what they are thinking. The sender is supposed to convey what is in his or her mind to the receiver. It is noted in the acronym WYSIWYG (What You See Is What You Get). So, Western people tend to be direct in their communication. In Eastern countries, people are raised to preserve harmony within the relationships, which they have built. It means to avoid being direct and not saying an outright 'no.' Eastern people tend to use indirect communication in what they say, and hope others would understand.

The second aspect of intercultural communication has to do with the language medium itself. In the modern world, English has become the main language of S&E. Earlier, it was possible for scientists and engineers to perform and disseminate their work in their native language. However, since the 1990s, English has surpassed other European languages in S&E, namely German and French; prior to that Latin was the main language of science in the Western world. Eastern countries tend to have English as their second language. Yet, English taught in Asian countries is neither pure British nor pure American, but it has its own version depending on the country. Most importantly, Asians are likely to have an accent, which may or may not be easily comprehensible to Americans.

Variations in work styles and intercultural communication impact performance, success, and career advancement especially moving from the technical to the managerial ladder [17]. Typically, a manager is seen to perform basic functions, which were outlined almost 100 years ago by Henri Fayol [5]. Fayolism's five basic functions of industrial management are (i) planning (plan and schedule every part of industrial processes); (ii) organizing (make certain that all of the necessary resources come together at the appropriate time of production); (iii) staffing (direct personnel activity); (iv) directing (make certain that personnel work together in a cooperative fashion); and (v) controlling (evaluate and ensure that personnel follows management's commands). Nobel Laureate Herbert Simon [33], among other things, proposed that successful managers ought to perform at least two types of decisions: (i) programmed decisions that are learned in advance and formalized in organization rules, policies, and procedures, and (ii) non-programmed decisions that are unpredictable in nature and cannot be formalized in rules, policies, and procedures.

A number of scholars have shown that Asian Americans in the United States are stereotyped as lacking leadership qualities [34,37,38,43,44]. Asian Americans are perceived to be good at the programmed decision, but not at non-programmed decisions. It is assumed that they are better suited to carrying out other people's orders than being in a management role. In the United States, Asian Americans are considered an over-represented minority in S&E [24]. They are considered the most successful ethnic group with high educational attainment and professional occupational status. Their image has changed from the yellow peril, brown hordes and coolies to a 'model minority' [38]. Yet, they are the least likely to be promoted to management in S&E organizations. Various terms have been used to describe the under-representation of Asian Americans in managerial occupations such as glass ceiling, silicon ceiling, and bamboo ceiling. This suggests that invisible cross-cultural issues result into under-utilization of S&E talents.

To sum up. the reality of high-technology companies in the US is that they increasingly employ scientist and engineers from different countries. When scientists and engineers with distinct cultures work together, cultural differences are performed and negotiated. Some of these differences are visible (e.g., reports, presentation, language) whereas others are invisible (e.g., values, teamwork, biases). In the workplace, they are reflected in the differences in education and training, work styles, career expectations, communication patterns, management outlooks, and so forth. This becomes rather challenging since professional paradigm and educational training convey that S&E activities are independent of cultural norms. Laroche [17] has noted that most technical professionals themselves do not recognize the impact of cultural differences in their work.

3. Methodology: A qualitative approach

Data for this paper comes from a large National Science Foundation (NSF) funded study on the return migration of scientists and engineers from the United States to India that was conducted from 2017 to 2019. Given that there is little information on the subject, qualitative methodology—focuses on why and how a certain phenomenon occurs by understanding attitudes, behavior, beliefs, characteristics, concepts, definitions, experiences, meanings, metaphors, and symbols. We interviewed 50 Indian scientists and engineers who returned to India after work and study in the United States; for a comparative group, we interviewed 40 Indian scientists and engineers, who were working in technology companies in the United States. The latter group is the foundation of this paper.

Participants were recruited from major cities in four states, namely California, New York, New Jersey, and Texas, which have the concentration of both technology companies and the Indian population. They came from two industries—information communication technology and biotechnology—since these industries employ the largest number of Indian scientists and engineers in the United States. Participants were selected through the snowball sampling method as a list of an Indian scientists and engineers and unrestricted access to companies were not available. The main criterion to select participants was that they must be working in the US technology companies for a minimum of three years.

A semi-structured interview guide was used to conduct in-depth interviews with them, which averaged about an hour. Most interviews were conducted face-to-face, only a few were via telephone. All interviews were audio-recorded and later transcribed verbatim. The transcriptions were processed in NVivo software for data analysis. To

ensure the trustworthiness of data, two coders coded the data. The codes were categorized by themes that allowed us to identify patterns within the entire text. A phenomenological approach—the lived experiences of a concept or a phenomenon for several individuals—was employed to understand the given topic. In addition to the demographic questions, the following out of 35 questions asked formed the basis for this paper:

- Does your Indian culture impact how you work and interact with peers and managers? If yes, how? If no, why not?

Findings are reported with interview excerpts to highlight the complexity of concepts and by frequency to show their strength. Typically, interviewees provided more than one response to show the impact of culture. In this paper, frequency in each category shows how many times it was mentioned; thus, the total would not add to 100% or 40 responses. To protect privacy and to comply with the Institutional Review Board (IRB) requirements involving human subjects in research, names of the participants, location, and information about their employers' is not disclosed.

At the time of interview, all participants were employed in the US technology companies. The 40 participants comprised of 28 males (70%) and 12 females (30%). The age group of the participants varied; the majority were between the ages of 30 and 39 (67.5%). A little over 15% of the participants were between the ages of 20 and 29 and about 10% ranged between the ages of 40 and 49. In addition, there was one participant each belonging to age groups 50 to 59 and above 60. Most of these participants (83%) were married with almost half of them having at least one child (n = 21). About 40% of the participants who were married had a working spouse at the time of their interview. The majority of the participants (83%) held a graduate degree with the remaining (17%) holding an undergraduate degree; out of graduate degrees, 63% held a master's degree, and 20% a doctorate. A majority of them (65%) had completed their terminal degrees in the US and the remaining (35%) were completed in India. These degrees were in engineering and related fields (66%) and in science (34%). The majority (67%) of these participants have held their current employment for less than five years, while 23% had been employed at their current position for five to 10 years, and 10% had been employed for over 10 years. Ten percent had resided in the US for over 20 years, 52% for 10–19 years, 15% for more than five but less than 10 years, and 23% for three to five years. A large majority of them (62%) had a H–1B visa or temporary work status, 23% were citizens, and the remaining 15% had obtained their permanent resident cards.

It should be noted that the methodology employed has some limitations. The data for this study came from a larger study on the return migration of Indian scientists and engineers. Thus, specific questions pertaining to elements of professionalism, social constructionism, communication, and management were not asked. Also, this study is based solely on the perspectives of Indian immigrant scientists and engineers; a comparative study needs to be undertaken which will also include perspectives of their American colleagues. Nonetheless, this study lays the basic groundwork for future studies on the role of nationalities in S&E activities.

4. Results

About one-eighth of interviewees (12.5%) acknowledged cultural differences between their colleagues and themselves but held that their technical education and training removed any possible influence from cultural differences. As one interviewee declared, 'When it comes to working everyone more or less performs the same way.' Another held, 'Computer work is the same here [US] and there [India]. There may be some social and cultural differences, but technical work remains the same.' Similarly, this interviewee said, 'Whether you are an Indian or an American, scientific knowledge is the same, the fundamental laws are the same.'

An overwhelming majority of interviewees (87.5%), however, noted significant cultural differences with their American colleagues in the workplace. As one interviewee generalized, 'I view America as a nomadic place where people come from all over the world. They bring their own style, which makes things rather interesting or I should say rich.' Similarly, another declared, 'Culture affects how you work, how you relate to people, what you think about, how you think about work, and the impact you have.' This interviewee generalized, 'Most of the work here is rather a high level in terms of technology, but it has some basic social ingredients.' Interviewees identified cultural differences in the areas of social interactions, working styles, communication, and management, which are elaborated below.

4.1. Conversation on Indian cultural norms

Most interviewees noted that even though American colleagues admired India as the world's largest democracy, they did not view it as a viable political state. With high levels of poverty and immigration to the West, India was seen as inferior to the United States. Yet, American colleagues were fascinated with India's cultural diversity among various geographic regions, languages, religions, and social traditions. A large majority of interviewees (68%) noted that general conversations with American colleagues centered around Indian culture, religion, social customs, family structure, sacred cows, and vegetarian food. According to them, Americans viewed them as culturally conservative, adhering to traditional cultural practices such as spirituality, yoga, joint family, arranged marriages, and personal identity within the caste system.

A common topic of general conversations with American colleagues was Indian marriage and the role of women. American colleagues were puzzled that Indians are willing to enter into matrimony arranged by parents and relatives, who decide on a life partner that they deem suitable for their child. This interviewee declared, 'Arranged marriages are always in people's heads.' Another showed his irritation, 'My colleagues always chat about marriages in the US and in India … In India, people have arranged marriage and love marriage, but here [US] there is no concept of arranged marriage. This conversation comes up all the time.' This interviewee justified his American colleagues' perceptions since 'Indians go to India for a couple of weeks and return to the US married with someone whom they briefly met just before the wedding.' According to interviewees, American colleagues did not understand how arranged marriages do not result in divorce.

A related conversation with American colleagues revolved around the role of women in Indian society. American colleagues believed that women in India were subordinated to family and were expected to practice chastity and domesticity. This female interviewee did not find funny that her colleagues joke about 'the Indian virtue of keeping virginity until marriage.' Another noted that her colleagues often bring conversation that 'in your culture, women should not do this or that … like they should not go on a date.'

Another popular topic of general conversation between Indian and American colleagues was on Indian food. According to interviewees, their American colleagues believed that they only cooked Indian food and went to Indian restaurants. Some American colleagues liked Indian food and they would approach Indians so they can 'go to the right restaurant and talk to the restaurant guys in the right way.' But for most American colleagues, the Indian food was positioned in a negative category with strong smell and spicy flavor. This interviewee did not appreciate that 'Everyone assumes that I am vegetarian and eat spicy food … Then they talk about if they like or dislike Indian food.' Another pointed out that one of her American colleagues was blunt to say that 'Indian food smells.'

According to interviewees, some American colleagues held that Indians remain isolated from mainstream American culture. Indians were seen as socializing mostly with other Indians and avoiding Americans inside and outside the company. As one interviewee said that his American colleagues believe that he is 'clannish.' Another admitted that

'if I see other Indians, I will start talking in [Indian language] … It is a natural thing to speak in your own language … Not all but some Americans often warn us to speak in English.' Mostly the practice of meditation and yoga was placed in a positive light among American colleagues. According to interviewees, Americans have become fond of good health and harmony between the body and mind, which meditation and yoga provide. This interviewee laughed, 'Everyone thinks we are all doing yoga.'

4.2. Differences in working style

A large majority of interviewees (59%) reported that they devoted more time and effort to projects than their American colleagues did. For Indians, failure was not an option; they did whatever it took to finish the job, even if it meant working 24 h a day and seven days a week. It was mostly because the stakes of failure were disproportionately high for them; without the company's sponsorship for temporary work visas or immigration, they might have to return to India and might not have become permanent immigrants, respectively. As one interviewee said, 'The strong thing about us is that we work hard, we put in long hours, and we get the stuff done.' Another said, 'You show yourself through your work. You work hard so you can get certain respect. Eventually, you realize that there are more ways to advance your career than just hard work.' This interviewee was not happy that his 'manager makes [him] work long hours and puts demands that the project has to be done in a much shorter time compared to other employees.' One explained, 'Perhaps it is because Indians want to establish themselves whereas Americans already feel established.'

Almost half of the interviewees (46%) acknowledged that interaction etiquette within the workplace was significantly different in the United States in comparison to India. The most common response was a marked difference in interaction within the construct of workplace hierarchy, in which low-ranked employees did not feel the restraint in questioning decisions of the high-ranked employees. As this interviewee explained, 'In India, we do not question authority. We do not question our parents. We do not question teachers. So, here [US] at work, we shy to question our managers. By not questioning, we end up suppressing our curiosity and power of reasoning.' Another said, 'Indian culture plays a role the way you interact with your supervisor, your managers. Here [US] is less deference to authority.' This one explained, 'Here [US], we have the freedom to not only question our manager but our manager's manager. In fact, we can question all the top-level executives. We can go to them and ask for anything. We can stand up to them.'

Some interviewees (36%) believed that mainstream American work culture was highly individualistic where employees competed with each other to maximize their accomplishments. According to interviewees, their American colleagues primarily thought about themselves even when they worked in a group. In contrast, interviewees believed that they valued relationships with others slightly more than their own interests and gave more precedence to the group than to themselves. According to interviewees, the individualistic approach of American colleagues led to less collaboration at work. This interviewee acknowledged, 'I am more collective in nature, so I tend to talk to people, get their opinions on things which are not common here.' Another said, 'We have a very effective instinct for collaboration. We are always looking to collaborate because it is a part of our culture. It comes very naturally to us. This does not happen here [US] unless one is required to collaborate.'

About one-fourth of interviewees (24%) reported a difference in how they approach a problem compared with their American colleagues. Differences in thinking were explained as culturally and educationally based modes of thinking. As students in India, they were expected to memorize definitions, formulae, facts, and multiplication tables from textbooks. They were tested on how well they reproduced such memories. With such learning, they were quick to recall basic facts as well as holding a firm foundational knowledge. According to interviewees who completed higher education in the US, students were expected to understand what they were taught so they can solve problems. Curricula in the US emphasized the development of cognitive skills, which students could use to analyze and evaluate tasks. According to interviewees, scientists and engineers primarily educated in the US or India approached tasks slightly differently. As one interviewee said, 'When people from different cultures come to a common workplace, they share their ideas, they share a different way of processing information, and I got to tell you that it is quite different.' Another said, 'the way we approach things, the way we tackle problems are clearly different.' This interviewee believed, 'We are very detail-oriented … We go down into the diagnostic and technical details which may be impossible for others.'

4.3. Issues in intercultural communication

A little over half of the interviewees (54%) noted that they were perceived as having poor communication skills mostly due to difficulties with the English language and their accents. In their companies, presentation skills and the ability to market projects to clients, colleagues, and supervisors were important. India has about 23 major languages and hundreds of regional dialects. Though English was not the first language of interviewees, they had a high competence in English, as they were educated through English instruction. Most of them, therefore, perceived themselves as having a good command of the English language compared with other Asians in the United States. As one interviewee said, 'I do not want to point out any particular country, but people from India are better off speaking English than people from a lot of other Asian countries. We are not the best English-speaking people, but at least we have some background.' Another said, 'There is always our accent how much we try, it is going to be different than Americans. That always plays as a part of the complication.' One interviewee showed his disappointment, 'People make fun of our accent to the extent we have become rather conscious.' Since Indians were not expected to have mastery over English among American colleagues, they got compliments if they spoke good English. This interviewee found condescending, 'when I meet people the first time, they often say that you speak good English, or your English is very good.'

Some interviewees (33%) viewed themselves as soft-spoken and slightly modest compared with their American colleagues. In their companies, things moved rather fast. Therefore, employees were expected to meet deadlines, say if deadlines were not realistic, or point out if there were other challenges. Interviewees thought that their American colleagues were much more comfortable to convey bad news or give negative comments than they were. Whereas American colleagues did not have any issue with saying 'no,' interviewees tried not to be so 'blunt'; instead, they did their best to give a polite response by using words such as 'maybe.' As this interviewee noted, 'We need to be more direct or perhaps more forceful if there are issues with projects or things are not working out as planned.' Another said, 'Somehow we do not say no as often as [Americans] do.' This interviewee acknowledged, 'We try to avoid conflict, maybe we are trying to appease people.'

Some female interviewees also highlighted discourse practices in which turn-taking and interruptions were perceived as significantly different. According to them, both American and Indian male colleagues interrupted them in meetings and often did not let them finish their sentences. This was noted as a gender than a nationality issue; since Indian male colleagues, who did not have the same status as Americans, also interrupted. Female interviewees viewed this as showing disrespect to women. As this female interviewee noted, 'My colleagues do not wait for me to finish, instead, they randomly interrupt and finish my sentences for me. It is quite a lot of here in this company … It sucks!'

4.4. Suitability of management skills

Most interviewees mentioned that their American colleagues and managers perceived them to be well-educated and technically good.

Interviewees noted that their American colleagues were impressed that Indians excelled in academic subjects, held high degrees, and worked in the technology fields. Thus, interviewees were seen as technically intelligent. As one interviewee said, 'We are seen as good at math, good with numbers.' Another said, 'My manager calls me if there is any problem on my side of expertise. He calls me right away so he can get the results quickly.' This interviewee thanked '[his] schools for laying the basic foundation in science and math rather well.'

About one-third of interviewees (27%) pointed out that though they were recognized to be hard workers and technically sophisticated, they were still seen as lacking managerial skills. Their American colleagues especially managers believed that they were more competent at technologically based work than in administrative work. This interviewee said, 'In business gatherings, it is automatically assumed that Indians are at the technical end of the link even though some are at the business end.' In other words, even when some Indians had climbed from the technical to the management ladder, they were still seen as technologists.

Most of these interviewees slightly blamed themselves for not being prepared for a management position. This interviewee acknowledged, 'We are very detail-oriented. But we do not try to get the bigger, broader picture. It is not that we cannot get the bigger picture, it is just we do not.' Another generalized, 'Indians are not systematic in their approach towards seeing how things get planned, how they get executed ultimately.' Further, interviewees were seen as lacking the aggressiveness associated with successful managers. Interviewees believed that they tended to rely on the quality and quantity of their work and hoped others would appreciate them. Unlike their American colleagues, interviewees were not outspoken or self-promoting. As one interviewee said, 'We do not take an aggressive leadership role. We kind of do the work but do not publicize it or proactively exhibit vision.'

It should be noted that these interviewees thought they needed some formal training to join the managerial ladder such as leadership training courses or apprentices under a manager. They acknowledged that the education and training they received in India and the US focused on S&E subjects; they did not have any training on management. Going outside from their field to management requires different knowledge of managing people, production, business strategy, financial market, consumer choice, commercialization, and so forth. Those interviewees interested in moving from the technical to managerial ladder believed they needed to learn supervisory skills on their own, as none were available to them. They appreciated the new trend among Indian students to pursue an MBA (Master of Business Administration) after an S&E degree so they can have better career prospects.

5. Discussion and conclusions

Since gaining its independence from Britain in 1947, India has directed its education policies to serve the challenges of economic growth and development. The government's support for modern S&E education has been essential for India's transformation from an economically poor and technologically backward country into a modern advanced nation. India has continued to invest in S&E education. Indian families teach their children from an early age that they will do economically well in life if they pursue an education in S&E fields. Indian higher education in S&E has grown and is considered one of the largest in the world. Some institutions of higher education in India such as the Indian Institutes of Technology (IITs), the Indian Institute of Engineering Science and Technology (IIEST), and the National Institutes of Technology (NITs) produce world-class scientists and engineers [23,27]. A significant number of S&E students from India's top institutes go to the United States for graduate education and seek employment and permanent stay after attaining their degrees. Since 1990, scientists and engineers with at least a bachelor's degree (or equivalent) have been entering the US workforce directly from India under a temporary specialty worker visa or the H–1B visa. When these scientists and engineers join the US workplace, they bring the Indian culture in which they were raised.

In a general sense, the differences between Indian immigrant scientists and engineers and their American colleagues show the importance of social and cultural factors to career satisfaction and progression, which is an overlooked area. An overwhelming majority of interviewees pointed out numerous differences that have impacted their work and relationship with their American colleagues. Since these interviewees were born in India, they were raised within the Indian social and cultural norms. Equally important is the fact that the majority of interviewees in this study had their terminal degrees from US institutions of higher education. As a result, most of them were socialized in the American S&E culture in which they learned how to perform technical work, evaluate their own work, and interact with their colleagues. Yet, findings reveal that Indian social and cultural factors matter. Even if the professional model considers various practices to be of minor differences, they were still considered to be very important from interviewees' perspectives.

US immigration policy favors the migration of skilled labor from India [31], which contributes to higher levels of education and S&E occupational status among Indian immigrants living in the United States. This leads to the general perception among American colleagues that Indian immigrant scientists and engineers are highly educated, technically sophisticated, and have a reasonable command of English. Such perception enables Indians to enter the US S&E workforce. However, once they start working, they are also perceived as lacking essential work styles and communication skills suited for American businesses. Both trends are a part of Indian immigrant scientists' and engineers' work lives. This study finds support for scholars who have shown that Asian Americans in the United States are stereotyped as lacking leadership qualities [34,37,38,43,44].

It should be noted that such perceptions reflect an innate discomfort, confusion, and possibly a struggle with rejection by American colleagues. The day-to-day challenge for Indian immigrant scientists and engineers is the negotiation of self-identity in a working environment that welcomes them on the one hand but maintains contradictory feelings about them on the other hand. In a settled way, their human capital is devalued, as their American colleagues have a somewhat negative perception of Indian immigrant scientists' and engineers' personalities, communication, and work styles. Indian immigrant scientists and engineers try to deal with stereotypes projected on them by self-editing social interactions such as blending in or making themselves less noticeable to facilitate an inclusive work environment.

The paper finds broad support for Hofstede's four national cultural dimensions [11,12], and Laroche [17] analysis of power distance. In both societies, the United States and India, people are ranked in a socio-economic hierarchy, in which some have greater wealth, status, and power than others. Whereas the United States has moved towards an egalitarian form of social organization, India's social system remains influenced by the ancient Hindu caste system, which ranks people from high to low categories. Consequently, Indian culture emphasizes respect based on social standing from birth, age, occupation, and wealth on the one hand, and collectivism based on group identity on the other hand. Interviewees acknowledged both their respect for authority and collectivism. They also mentioned not being assertive and ambitious as exhibited by American colleagues. At the same time, the paper shows that the national culture of Indian immigrant scientists and engineers is not as homogeneous as assumed by Hofstede [11,12]. For instance, Indian immigrant scientists and engineers who have gone through education in the United States and been there for a long time have fewer issues than those who hold a terminal degree from India and are new arrivals with temporary work permits (H–1B visas).

Getting a job in S&E companies is not a significant problem for Indian immigrant scientists and engineers. The real issue is furthering equal career-advancement opportunities for them. Due to perceived differences in work styles, communication, and leadership qualities,

Indian immigrants end up being segregated in technical S&E occupations. They do not climb to a supervisory position. The paper shows that interviewees blamed their social and cultural upbringings and norms for the absence of requisite managerial qualifications. They did not assign responsibilities to management that impeded their career advancement. Either way, corporate America does not appear to be capitalizing on Indian immigrant scientists' and engineers' full potential. Laroche [17] has shown specific actions which managers and technical professionals need to take to address the performance and success of their assigned jobs as well as career advancements.

The paper also shows that Indian immigrant scientists and engineers are studious, hard-working, and willing to work long hours under any conditions. It is mostly because there is a general perception that skilled foreign-born work for less money, take coveted jobs away from qualified American citizens, and American companies prefer to hire from abroad to keep costs down. Such perceptions create a competitive work environment for Indian immigrant engineers to work hard. However, this aspect of work style is missing from Hofstede's model of comparing national cultures.

It is interesting to note that general interaction at work between Indians and Americans centers on Indian cultural issues. Americans are interacting with Indians at work on a personal basis as the study shows. However, Americans had their own boundaries with Indians who are dissimilar in nationality, ethnicity, and culture, which also become the main focus of their social interactions. This is especially apparent with the discussions of traditional Indian culture, which positioned American cultural practices as advanced in comparison to Indian culture. The study, therefore, provides general support for Said's thesis on orientalism [29]. At the same time, the study shows that such inquiries from Americans are not due to racism as portrayed in Said's book; instead, they are based on common caricatures of Indian culture and driven by a curiosity about the unknown. Nonetheless, such conversations do not provide information to Indian immigrant scientists and engineers that would be important for their career advancement. Indian immigrant scientists' and engineers' human capital rests largely in their higher education, training, and technical skills. However, they miss out on social capital as their conversations with American colleagues do not center, for instance, on the vital information about the labor market in S&E occupations, new ideas about their current and future projects, and valuable news about job openings inside and outside of their companies.

The study shows that interviewees often practice at least some elements of their traditional Indian cultures in the United States. It means they are not assimilated as desired by Gordon [8]. Nonetheless, the important question should not be whether Indian immigrant scientists and engineers assimilate in the US as proposed by assimilation theorists, but whether Americans offer them a fair opportunity to succeed. The study reveals some prejudice that Indian immigrant scientists and engineers face at work. It also shows two trends of multiculturalism: (i) American society appears to be at some ease with immigration and the cultural diversity which Indian immigrant scientists and engineers bring; and (ii) Indian immigrant scientists and engineers are to remain in the ethnic and cultural milieu. Interviewees in this study tend to maintain a sense of balance among practices and values of Indian and American cultures. They have learned to negotiate identities to match the context, which adjusts to both cultures. This also shows that Indian immigrant engineers do not always live their lives according to scientific rationality as portrayed by professionalism.

A large majority of interviewees in this study noted differences in S&E discourse based on socio-cultural factors and education. Indian immigrant scientists and engineers have a different set of values, work styles, and communication patterns compared with their American colleagues. As high technology companies have become more diverse, the influence of different nationalities on work and interactions becomes rather apparent. Very few interviewees held that their cultural values do not influence the way they conducted technical activities. These interviewees believed that being from India, which is economically, socially, and culturally different does have an influence on technical activities but held that the result is not different significantly due to these factors. This study, therefore, finds support for social constructionism, in the sense of how social and cultural factors shape the way technical work is conducted.

To conclude, the study finds that the importance of social and cultural factors cannot be overlooked. Culture guides how people interact with each other and how work is performed. Because Indian immigrant scientists and engineers work together with their American colleagues, they bring their cultural values to work style, decision-making, communication, and work designs. Scholars have focused mostly on the roles of gender and race in S&E activities, but they are yet to take nationality and cultural background as an important variable, which this paper has done. Most importantly, the paper has shown that culture matters. Invisible cultural issues make working environment to be less challenging, collaborative, engaging, friendly, rewarding, and supportive. They lead to under-utilization of talent of Indian immigrant scientists and engineers.

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