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Addressing the Gender Gap in Innovative Companies: Does the Culture of Innovation Turn Women Away?

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Abstract

There is a large gender gap in technological roles at highly innovative companies in the United States that reduces their ability to exploit a diverse knowledge base. Diversity in human capital is key to the success of innovations in an organization, this paper proposed that it is the inherent characteristics of the culture of innovation that prevents women from applying and staying in innovative roles. Using thematic review, this paper analyzed research in the areas of the culture of innovation as well as the organizational cultural preferences of women to understand what values are incongruent that could be causing this gap. Results showed that there were many incongruent factors between the culture of innovation and preferences in organizational culture for women and that this is a valid reason why these roles are not sought out of kept by women. The results suggested that managers should implement and sustain supportive values to balance an organizational culture that needs to focus on innovation, but also wants to have diversity of thought.

Keywords: Organizational Culture, Innovation, Gender, Women

It is a known fact that there is a significant gender gap in jobs requiring the skill set of science, technology, engineering and math in the United States. There is a great deal of recent material that has been written on the subject with quotes such as: "Although women fill close to have of all jobs in the US economy, the hold less than 25 percent of STEM (Science, Technology, Engineering, Math) jobs" ("Women in STEM", 2011). "Women working in STEM fields are 45% more likely than men to leave within the year, and its not for lack of enthusiasm" (Porter, 2014). "In the mid-1980s, 37% of computer science majors were women; in 2012, 18%" (Gilpin, 2014). Each article speaks to why the author believes the gap exists and ways of improving the pipeline of women in technology. Unfortunately, the conclusions of these articles are not evidence-based research driven, a scholarly lens should be applied to address the problem.

The authors of non-scholarly articles have missed a glaring question: What if the organizational culture of innovation itself is what deters women from seeking out these opportunities or staying in these roles? This question ultimately became the research question this paper is built upon. Using an evidence-based research approach this paper sought to discover if the inherent culture of innovation and the organizational cultures that women prefer are congruent and dissected the factors that are not. The dissection of incongruent characteristics could allow the reader to understand why women do not seek or stay in the roles of innovation. Research on the culture of innovation and the organization cultural preferences for women are extracted, quality reviewed, and analyzed. Results of the analysis are discussed, and a concept map of the findings reviewed. Finally, conclusions, limitations, implications, and suggestions for future research topics are shared.

Literature Review

Organizational Culture

Schein (2004) wrote that organizational culture is built on values derived from norms, artifacts, and behavioral patterns. When organizations put an emphasis on cultural values through these norms, artifacts, and behaviors, a company can have a large influence over the behavior of their employees (Shein, 2004). Norms are the expectations of behaviors that put pressure on an individual to act in a certain way. An example of a norm is what time employees are expected to arrive for a meeting, the norm in some companies is that being on time is extremely important, and in others it is acceptable to be a few minutes late. The value that this norm is attempting to instill to an organizations employee is time sensitivity.

Artifacts are the physical items that an individual can see in the organization, or stories heard about an incident that happened in the company. An example would be walking into an office building and seeing a great wooden desk, expensive furniture and décor. One could derive from these articles that the company makes a great deal of money or wants to give the appearance of opulence. The value being emphasized by this artifact is the importance of financial wealth.

Behavioral patterns are the types of language, rituals, or customs that the organization has and can be expressed in the form of a habit that everyone goes to the same place for lunch on Wednesdays (Cimpeanu, 2011). This behavioral pattern could show an employee the value of getting out of the office during the work day and still being together as

a team. Artifacts, norms, and behaviors create values that build upon each other to create "the way we do things around here" (Martins &Terblanche, 2003).

Role of Innovation in Organizations

Rogers (1998) theorized that innovation is the application of new ideas to a product, process, or activity in a company. According to Hogan and Coote (2014) innovation is vital to the survival of organizations, especially when competing at global levels. To remain competitive in the global market, organizations needed to exploit their innovative capacity and integrate the philosophy of innovation into the fabric of their culture. Ostergaard, Timmermans, and Kristinsson (2011) stated that innovation is an interactive process requiring a diverse knowledge base and improved the learning capacity of the organization. The greater the pool of ideas and creative thought, the more likely that an innovation would be to occur. Studies by Diaz-Garcia, Gonzalez-Moreno and Saez-Martinezs (2013) and Ostergaard, Timmermans, and Kristinsson (2011) found that there was a significant positive relationship between gender diversity and innovation. Results like these indicate that having a diverse gender composition increases the likelihood that an innovation will be introduced. Therefore, diversity aspects in human capital cannot be ignored if the organization wants to improve its innovative capacities.

Thesis

Based on an initial review of literature in the areas of innovation and organizational culture for a business to be successful at innovation, there needs to be diversity in the thoughts gathered from human capital. This paper specifically addresses this diversity in the form of gender and suggests that the culture of innovation has inherent value characteristics that negatively influence the job satisfaction of women. An initial concept map pictured below shows the organization that will ground the research analyzed for this paper.

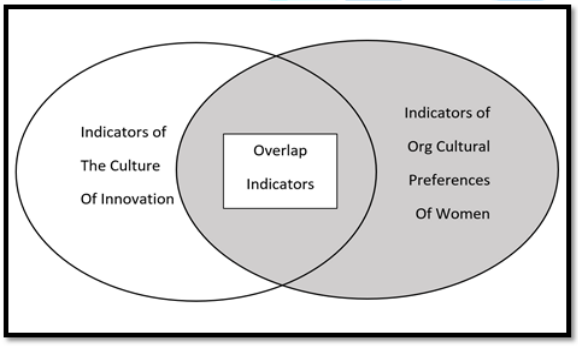

Figure 1: Initial concept map used to compare indicators and preferences of women and innovation.

Method

This paper is a thematic rapid evidence assessment (REA) and will use the review methodology suggested by Varker, Forbes, Dell, Weston, Merlin, Hodson, and ODonnell (2015). This method was preferred due to its focus on a clear research question, development of a reproducible search strategy, explicit evidence selection criteria, and transparent quality assessments of the evidence found. The research question provided two themes and search strings to collect data; culture and innovation and the organizational culture preferences of women. The key words used to form the Boolean search for evidence retrieval based on these themes were: *cultur*, innovat* and gender, "organizat* cultur*", job satisfaction.*

The *cultur*, innovat** search string was applied in the UMUC One Search tool and 188,953 articles resulted. The search was then limited to scholarly (peer reviewed) journals in English with a subject specification of "Organizational Culture" and "Innovation", this reduced the results to 474 articles. The removal of duplicates the resulted in 320 articles for title review, subsequent abstract review led to 26 articles for full review. The review of full articles left one with the quality, relevancy, and rigor required based on the quality metrics. Due to the lack of research retrieved after exclusion a snowball method was used on the one article to locate two more articles that met standards. The snowball method has been found to be a valid approach to finding additional sources when initial sources are not of quality for use in review (Greenhalgh & Peacock, 2005).

The gender, "*organizat* cultur**", job satisfaction search string was applied in the UMUC OneSearch tool and 2,965 articles resulted. The search was then limited to scholarly (peer reviewed) journals in English with a subject specification of "Organizational Culture" and "Job Satisfaction" that reduced the results to 69 articles. After removal of duplicates reduced the results to 51 articles for title review a subsequent title and abstract review led to 26 articles for full review. Review of full articles left 4 with adequate quality, relevancy and rigor for this paper; see Appendix 1 for PRISMA diagram.

The strength and quality of the evidence was measured using Varker et al.s (2015) procedure for judging the strength of the evidence modified to remove the direction of the evidence base. The reason this item was excluded was because the direction of the evidence being positive or negative was not an indicator of quality needed for this papers purposes. The areas left for quality review applied to strength of the evidence base, consistency, generalizability, and applicability. A scale of 1-4 was applied with 1 being weakest and 4 being strongest in each of the categories based on evidence base being accurate, consistency in the methodology used, generalizability across multiple groups, and the applicability to the research question. Each article in the full review was subjected to this quality measure ranking of 1-4 in each category, no article below a 2.5 average was kept. The quality assessment of the articles kept for review can be found in Appendix 2.

Results

The Culture of Innovation

Martins and Terblanches (2003) review of literature found that there are five elements of organizational culture that have an influence on innovation in a company. They included its strategy, structure, support mechanisms, behaviors that encourage innovation, and communication. The sole element of focus that was applicable for this paper were the behaviors that encourage innovation. The determinants that influenced the level of innovation as described by Martins and Terblanche (2003) are mistake handling, idea generation, continuous learning culture, risk taking, competitiveness, support for change, and conflict handling. The authors pointed specifically to increased innovation when the company encouraged:

- Autonomy
- Flexibility
- Quick decision making

- Cooperative teamwork
- Opportunities for professional growth
- Time to think creatively and experiment
- Tolerance of mistakes
- Low management control
- Risk taking

Applying these characteristics to the culture of an organization was found to improve and encourage the businesses human capital to be more creative and ultimately innovative.

A different approach to the culture of innovation was provided by Judge, Fryxell, and Dooley (1997) when they introduced the idea of communities of innovation. Their study reviewed innovative companies to locate what caused the differences between high and low innovation levels in companies. Judge et al. (1997) found that the difference between low and highly innovative organizations was based solely on whether there was a sense of community in the workplace. Innovation required honest communication and commitment to peers and work, building trust, and caring environments (Judge et al., 1997). The characteristics that built a culture of innovation according to the authors also included:

- Freedom
- Balanced autonomy
- Experimentation
- Risk taking
- Intrinsic rewards for individuals and groups
- Group cohesiveness
- Effort put in by managers to create a team environment
- Reasonable goals
- Continuous slack resources

Judge et al. (1997) posited that only the organizations that focused on these characteristics would survive and that many mature firms were not leveraging their intellectual talents in an innovative way.

The research of Ahmed (1998) posited that "culture is a primary determinant of innovation" and that it is typically organic in structure. His research resulted in concepts of innovative culture being delineated into four categories structures, norms, debates, engagement. He found that the cultural characteristics that promoted innovation in an organization included:

- Freedom from rules
- Participative and informal
- Flexible
- Little red tape
- Dont be obsessed with precision
- Timeliness
- Hard work is expected
- Experimentation
- Freedom to try and fail
- Dont be too sensitive
- Expect and accept conflict
- Large time expectation
- Quick decision making
- Mutual Respect and Trust

Ahmed (1998) also theorized that an innovative culture is created by the actions, not words of management. Therefore, it was not enough to say that you were an innovative company, you must show it through actions.

Organizational Culture Preferences of Women

Women have specific organizational culture preferences that provide them with higher job satisfaction and organizational commitment. The study done by Jandeska and Kraimer (2005) created a scale based on two styles of organizational culture; collectivist and masculine. Collectivist characteristics of a business were defined as employees were treated like family, protected by management, kept informed about major decisions in the company, and the organization took care of its employees. The masculine cultural indicators were defined by independence, self-promotion, ambitiousness, decisiveness, and aggressiveness. The authors found that women felt that they did not fit in organizations that had these masculine cultural characteristics. Jandeska and Kraimer (2005) concluded that women who perceived their organizations culture to be high on collectivist values had greater satisfaction in their careers and organizational commitment, however, the more masculine the culture was perceived by women the lower job satisfaction.

According to Martins and Terblanche (2003) job satisfaction in human capital can be directly linked to the culture of an organization. The research of Bellou (2007) found that women had higher job satisfaction when the culture of the organization valued:

- Attention to detail/being precise
- Single approaches
- Taking advantage of opportunities
- Defined rules
- People orientated
- Calmness
- Work/life balance
- Responsibility
- Being reflective

The authors noted that negative job satisfaction characteristics for women were those that were aggressive, not tolerant of other view points, and quick in their decision making. Because job satisfaction can have a positive influence over the behaviors of employees, management should develop an understanding of how to take that into account by gender.

Looking at a more defined subset of women Westring, Speck, Sammel, Scott, Conant, Tuton, Abbuhl, and Grissos (2014) research focused specifically on women with careers in medicine. The authors looked at three aspects of culture that affected women; work-to-family conflict, work hours, and work role overload. Westring et al.s (2014) previous research in organizational culture had developed a measurement tool that concentrates on four dimensions of culture for womens careers called the Culture Conducive to Womens Academic Success or CCWAS. These dimensions were support for work-life balance, equal access to opportunities, freedom from gender bias, and chair/chief support. Using the CCWAS as a tool Westring et al. (2014) found that women who were exposed to time-based and strain-based work family conflict had a higher incidence of turnover intentions and had poorer mental and physical health. They found that time-based and strain-

based conflict was triggered by longer work hours, work overload, and low supportive culture. Westring et al. (2014) also concluded that in organizational cultures that were found to be unsupportive, simply lowering the workload would not be an effective way to reduce turn-over intentions. Thus, supportive cultures were the key to maintaining organizational commitment and lowering turnover and turnover intentions in women.

Catanzaro, Moore, and Marshalls (2010) researched three measures of organizational attractiveness to job seekers; job pursuit intentions, organizational preference, and organizational choice. They found that men were more likely to pursue opportunities with competitive organizations where women were more likely to pursue jobs at companies that reflected supportive cultures. However, Catanzaro et al. (2010) found that both males and females reported a stronger intention to pursue a job with an organization with a supportive culture, even if the pay was less. This finding supported their hypothesis that both men and women prefer supportive and collectivist cultures in their organizations. Catanzaro et al. (2010) hypothesized that businesses with a more supportive culture would have an increased number of applicants from both genders. This increase could help to improve the quality of the applicants and therefore improve the quality of the hire.

Discussion

Concept Map

Below is a concept map that combines the value elements of the culture of influence and the preferences of women in organizational culture found in the research:

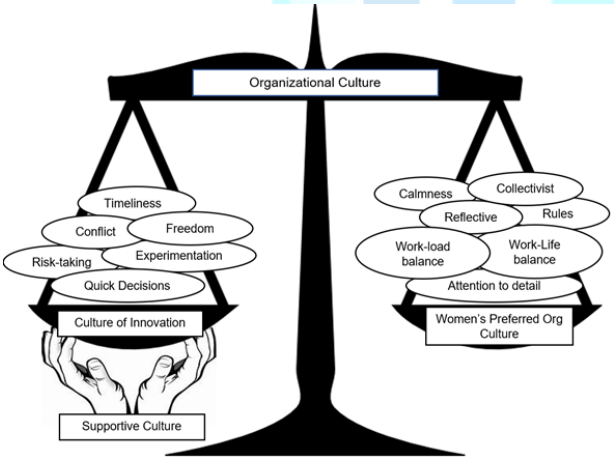

Figure 2: Concept map created based on the research on the culture of innovation and womens preferences in organizational culture.

Concept Map Narrative

Based on the research analyzed, the defined culture of innovation (COI) and the organizational cultural preferences of women have distinct characteristics that are congruent between them and many that are not. This paper interpreted the organizational culture of a business that strives to be innovative as a balance between the COI and womens cultural preferences in the form of a scale. The cultural factors of both COI and women preference are assumed to both be inherent to each other, could not be changed, and therefore are not able to be removed from the scale. The scale used in the concept map has the incongruent cultural factors on either side, while a supportive culture acts as the counterweight to balance the two. This balance helped women feel they "fit in" the culture of the organization without losing the innovative needs of an organization.

Incongruent Cultural Factors

The incongruent factors between the COI and the preferences of organizational culture for women are listed in the table below:

Culture of Innovation	Org Culture Preferences of Women
Autonomy/Freedom	Protected
Flexible/Experimentation	Single Approach
Quick Decision Making/Time Sensitive	Reflective
Tolerance of Mistakes/Minimal Precision	Attention to Detail
Low Management Control/Minimal Rules	Defined Rules
Risk Taking	Responsibly
Hard Work/Fast Paced	Calm
Expect/Accept Conflict	Open Communication

Table 1: Incongruent factors of innovation and organization culture preferences of women.

Organizational culture requires balance in an organization, the incongruent characteristics listed in Table 1 add weight on either side. The COI prefers autonomy in the workplace with great freedom to experiment, take risks, with little oversight from management. It is a fast-paced culture where decisions must be made very quickly, therefore there is a need for tolerance of mistakes. On the other side, the preferences of organizational culture for women is one that is protective, calm, and gives time for reflection. Women prefer an organization that has defined rules that they understand how to follow, a single approach that is familiar, and where any conflict can be discouraged by open communication.

Unfortunately, based on the current global climate highly innovative organizations have had a need to be more focused on the culture of innovation, forgetting that without diversity they are diluting their capacity to innovate. These characteristics create an organizational climate that women are not willing to tolerate working in, or willing to stay working in for long. Women do not want to work for a company that does not share their values in work roles. Without understanding and adjusting to the organizational cultural preferences of women innovative organizations have even less of the small pipeline of women with the applicable skill sets.

Congruent Factors

Fortunately, there are congruent factors that can be found between the COI and the organizational cultures preferred by women. These factors are:

- Caring Environment
- Participative
- Collectivist
- Mutual Trust and Respect
- Slack Resources
- Work-Life Balance
- Opportunities for Professional Growth
- Cooperative Teamwork

- Reasonable Goals
- Group Cohesiveness

On the scale shown in the concept map in Figure 2, these factors are grouped and commonly referred to as a supportive organizational culture. This supportive culture acts as a support that counterbalances the incongruence and balances the needs of the COI and womens preferences for organizational culture when there is a need to focus on innovation in a company. The research analyzed has shown that if an organization had a culture that supported these collectivist values they would ultimately attract both male and female applicants for innovative roles and could reduce the turnover intentions in women.

Implications for Managers

Successful innovation depends on diversity of thought, diversity of thought is only brought on by diversity in human capital. For organizations whose bottom line depends on innovation, it would be wise for them to review their organizational culture and take note of whether they are focused on the incongruent factors of the culture of innovation or if they have a supportive enough culture to outweigh the demands that a COI brings to a company. If a company is focused on cultural characteristics such as risk taking, quick decision making, little precision, and low management control a change in the organizational culture may be needed to bring about more diversity, specifically in gender. Adding values such as a caring environment, work-load balancing, and group cohesiveness could help not only keep women in innovative roles, but could also attract others with the right skill set to apply for open roles.

The activities that management can encourage are collaboration and team work, tele-working/flexible schedule options, and building relationships amongst peers. The research also suggests organizations address their opportunities for professional growth and ensure that there are equal opportunities for all in the organization to learn and grow in their careers. A common theme that was established in both areas was one of balance; a balance of autonomy and a balance of work-life/roles. Managers must also understand that there is such thing as giving an employee too much freedom as well as burdening them with too much in their work-role.

Implications for Scholarship

This research is not new, and the findings are not ground breaking, but there is something to be said about understanding and working on topics like cultural incongruities and how best to balance them for a diverse workforce. This type of research can also be applied to other types of roles in organizations, not just the ones that require a STEM skill set. One of the main areas of conflict in the research reviewed was that there is an argument that both men and women prefer supportive organizational cultures. Suggesting that all organizations could benefit from reviewing their culture and adding those values of support that are also missing. Scholars should look to this analysis as a comprehensive review of the subject matter and trust it to use for further research topics in organizational culture.

Limitations

The main limitation in this review was the limited amount of resources found in the search string for innovative culture was extremely low in quality, requiring the use of the snowball methodology. While the snowball approach is considered to be effective, it is not necessarily optimal. Consistency was also a large limitation in the research that was reviewed for this paper. Two of the articles analyzed had received a one (1) for the consistency in the methodology because there was no mention of how literature was chosen for use and rigor of quality could not be established. This meant that the conclusions could be biased based on the lack of rigor in the review process.

Conclusions

For an organization in the United States to compete and thrive in a global environment they are required to be innovative. The culture of innovation is very different than other organizational cultures and has factors that are inherent to itself. These factors are not something that can simply be changed, the culture of innovation is simply, what it is. The culture of innovation is fast-paced, experimental, and risk-taking, this is not congruent with womens work preferences of defined rules, calmness, and order. Organizations can improve the gender diversity in their human capital by focusing on the cultural factors that can help to balance the risk taking, quick decision making, autonomy, and time demands. Management should actively participate in activities and values that create a supportive culture, one that will provide all employees with a work-life balance, a feeling of belonging, and a sense of a common purpose.

Future Research

Future research should be conducted on the differences between the actions and words in supportive cultures and whether this makes a difference in turn-over intentions. Focus should also be made on the depth of culture of innovation specifically in regard to artifacts in innovative companies. None of the research reviewed specified anything other than behaviors and norms, because artifacts are a large part of organizational culture it is important that these be researched more deeply. Lastly, there was mention in the research of mentoring activities being taken on be women when there was not a supportive culture, more research should be done in this area to assist organizations in understanding how female mentoring being triggered without the organizations support could be a symptom of an unsupportive culture.

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