# Mentoring East Asian Women Science and Engineering Faculty

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ABSTRACT.  The goal of this preliminary study was to develop a framework for success in mentoring East Asian women scientists and engineers. Six women participated in two-hour interviews providing oral histories that revealed some common themes. In Asia, while science and engineering studies are encouraged, especially for girls, the interviewees had little mentoring. Upon coming to the United States they found themselves isolated in their universities as both East Asian and female minorities. The study findings suggest collective mentoring through a department-formed team of senior mentors with public administrative support is a good model for East Asian women. In this approach, assigned mentors would include at least one woman. Mentors would have an understanding of and be able to discuss work/life balance and would work with protégées to help them with goal setting. This research complements findings of other studies describing mentoring teams working with minority faculty and the importance of women mentors in addressing psychosocial issues. This research uncovered the limited role of East Asian faculty mentors and the need for role models.

## INTRODUCTION

In universities in the United States a small but significant number of faculty members are women scientists and engineers who immigrated from East Asia after completing their degrees. These "East Asian women" often find inadequate mentoring and support services because of a lack of colleagues with similar experiences. For example, a review of lists of faculty and graduate programs at The Ohio State University revealed that of 229 faculty members in the College of Food, Agricultural and Environmental Sciences, only two percent are women born and educated in East Asia. A similarly small percentage can be found in College of Engineering and the science departments in the College of Arts and Sciences. Collectively only 10 East Asian women are among the tenure track or tenured faculty in non-medical science and engineering at The Ohio State University.

Mentoring is an important service that senior university faculty provide to encourage success of junior faculty. A mentor is defined as a person giving help and advice to a less experienced and often younger person (Cambridge Dictionary 2015). Little to no research focusing exclusively on the mentoring of East Asian women scientists and engineers at U.S. universities exists. However, mentoring among Asian American and Asian faculty appears to be at a lower rate than mentoring in other ethnic groups.

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Sands and others (1991) collected mail questionnaire responses from a random sample of tenured and tenure-track faculty and all minority faculty members at The Ohio State University. They found only 54 percent of Asian faculty worked with mentors compared to 71 percent for white faculty. Goto (1999) reported a greater percentage of Hispanic (53 percent) and African Americans (54 percent) than Asian Americans (43 percent) had mentoring experiences. Kim and others (2014) interviewed 11 Asian women on the psychology and counseling faculty and found they had difficulty finding networks and mentors due to lack of formal mentoring programs for women of color and the isolation of being the only international faculty member. However, researchers have demonstrated the importance and impact of mentoring in Asia. Bennett and Bell (2004) developed a list of the 20 best employers in Asia using local and regional judging panels. In their assessment of leadership and talent they compared the "best" to the "rest" and found that mentoring is used by employees in 80 percent of the "best" companies in Asia as compared to the rest of the Asian companies at only 57 percent.

Various theories have been advanced to explain the reasons for low participation in mentoring programs. For example, Goto (1999) presents two theories as to why Asian Americans participate at a lower rate than other groups in mentoring relationships. One theory is that this group feels successful enough without using mentors. Kim (1973) explored this theory and found a gap in Americans' understanding of the strengths, needs and aspirations of Asian Americans that has resulted

in a lack of social services for this group. The other theory proposed by Goto (1999) is with collectivism as a cultural value and how Asian immigrants worry about being a burden on others, so they do not seek mentoring.

Asian mentoring models are different from western models in their approach and goals. Eastern values focused on interdependence (Liang et al. 2006) may conflict with the individualism of western cultures. Gang (2012) presents an Asian Confucian model of mentoring relationships that places actions before words, with role modeling as the primary approach. These differences combined with isolation confront many Asians who immigrate to work in the United States.

Forming and sustaining mentoring relationships presents challenges, including finding suitable and knowledgeable mentors to overcome cultural, ethnic, racial, gender, or organizational barriers. Kram (1985) presents organizational constraints to mentoring. In some organizations changes in the reward system and organizational culture are needed to incentivize mentoring so that relationships form. From a survey of undergraduates enrolled at a women's liberal arts college, Liang and others (2006) found a mismatch of cultural expectations between non-Asian mentors and Asian protégées. They suggested mentor training and a more structured mentoring program in pairings, meetings, and context. In sharing their personal narratives, Stanley and Lincoln (2005) wrote about the challenges of cross-race mentoring. They concluded that mentoring a person of another race requires extra sensitivity. Sands and others (1991) reported that many Asian faculty members were uncomfortable with the inequity of the mentoring relationship. For example, the protégé did not want to be exploited or treated as an assistant.

Models have been proposed for mentoring women and minorities. Kram's (1985) model of a combination of career and psychosocial mentoring functions is often cited as the base for the models. Chesler and Chesler (2002) analyzed the literature and presented four models for mentoring women engineering scholars. In the first model, the male-dominated academic environment is called the "heroic journey." The model emphasizes technical conversation and career commitment and is designed to challenge and stress the protégé. This heroic journey fosters a highly competitive "boot camp" environment and is intended to build independence. This model is often

not applicable, Chesler and Chesler suggest, when a woman is the protégé because female faculty may want praise rather than a challenge, support rather than a test, and collaboration rather than competition.

Chesler and Chesler (2002) put forward three alternative models to the heroic journey: 1) multiple mentoring that involves a protégé-built team of multiple mentors; 2) peer mentoring that relies on friendship circles to share difficulties; and 3) collective mentoring as a department formed team of senior female and male mentors with public administrative support. Of the three alternative models, the researchers found collective mentoring most appropriate for women and people of color.

Because of low numbers of minorities in many university departments, engaging them in research is challenging, especially when protecting their anonymity. Smith and others (2000) conducted a quantitative survey about diversity issues regarding faculty mentoring. Of the 765 faculty who responded, only 5.8 percent were Asian Americans. The low number of Asian respondents required Smith's group to include them with other minorities for statistical analysis. In a study on the role of organizational politics and culture on mentoring women faculty, Gibson (2006) assigned pseudonyms for the nine female faculty volunteers from three universities she interviewed to protect their anonymity. Kim and others (2014) interviewed 11 East Asian counseling and psychology faculty to explore their work experience. They found it difficult to find senior East Asian women to interview and identified no women at the full professor rank in the accredited counseling or clinical psychology programs. Kim's group was concerned about maintaining anonymity in the small and recognizable population. When nearly every member of a minority group is interviewed, even greater care is needed to protect anonymity by omitting identifiable experiences from the analysis.

The goal of this study was to propose a new framework for successful mentoring of East Asian women scientists and engineers at U.S. universities. We sought to address four specific questions:

• Are mentors important to success at work, especially in the context of work/life balance issues?

• Do mentoring styles matter?

• What impacts mentor selection? Are mentors best appointed or self-selected?

• Are Asian mentors preferable? Are women mentors preferable?

## METHODS

East Asian women faculty members were identified at The Ohio State University from male-dominated departments in the Colleges of Engineering, Public Health, Arts and Sciences, and Agriculture. Ten potential participants were invited to participate in the study, seven women agreed to be interviewed, and six (60 percent) completed the interview. Five were tenured, associate professors and one was a pre-tenure assistant professor. This narrative research method was similar to that used by Gibson (2004). All participants had been mentored as faculty, with three of the women having one of the authors on their mentoring team.

Participants were asked about their career development and mentoring in four major areas.

1. Early decision making and the role of mentors;
2. Graduate school and career counseling;
3. Faculty success and departmental mentoring; and
4. Life mentoring, goals, culture and family.

The interviewer was a Chinese American professor who first assured participants of anonymity and informed consent was obtained orally from each participant. The two-hour interviews followed an approved IRB protocol (2013B0124) consisting of nearly all open-ended questions. All interviews were taped and transcribed. A female engineering professor with a graduate degree in East Asian studies, reviewed the transcripts looking for common themes and shared mentoring experiences and used these themes to support the proposed framework.

## RESULTS

Each woman interviewed took a different path to become a successful faculty member in science or engineering. However, common themes emerged from the oral histories about the role of mentoring in their career development. Some of the findings are highlighted in Table 1.

Before they were mentored at U.S. universities, these East Asian women scientists and engineers brought with them experiences from the educational system in Asia. All of the women interviewed went to college in Asia before coming to the United States to get their PhDs. They all were current faculty members and four of the women had post-doctoral experiences in the United States.

### Pre-mentoring experiences from Asia

While attending school in Asia, all of the women excelled in and were encouraged to study science and

math and to pursue further education in science or engineering. However, the encouragement did not qualify as mentoring as it is defined in this research. Two of the women worked as interns in research labs outside their universities while working on their Master of Science degrees. In these non-academic environments they did have positive mentoring experiences. As Bennett and Bell (2004) found, the best Asian companies are adopting mentoring and the practices in the business world may be more developed than in the university environment. One of the interviewees lived with two professors (one male and one female) while going to school. In this circumstance, she was able to learn about being an academic from them, ultimately considering them mentors.

As girls in Asia, all of these women were encouraged to study science and engineering. Five of the six spoke of how technical expertise was valued at the national, provincial and local level. Five of the six added that their families also encouraged their daughters to study science and engineering. Even though their families supported their goals to be scientists, four of the six women mentioned that they were on their own when they were making decisions about their future. Two of the six spoke of a classmate network that was looking for and sharing information about traveling abroad for advanced graduate study. Two of the six felt that their culture restricted their opportunities and impaired their ability to make decisions because they were following government or family directives.

### Pre-mentoring experiences upon coming to the United States

All of the women came to the United States to pursue advanced degrees. Three of the six were married and two of these women had a child in Asia before traveling to the U.S. None came to join a family already established in the U.S. Five of the six were invited to join a research program by a graduate advisor. Once these women arrived in the U.S., they became minorities in different ways than other minority faculty who came up through the educational system. Their minority status included their ethnicity and their gender as women in science and engineering. Bland and others (2009) describes this isolation of minorities and women especially in the sciences and how it can create marginalization and collegial exclusion. This study found that for five of the women interviewed, the isolation extended even further as they had few women, if any, as teachers and advisors.

**Table 1**
**Summary of interviews of six East Asian women scientists and engineers**
**at The Ohio State University**

|  | #1 | #2 | #3 | #4 | #5 | #6 |
|---|---|---|---|---|---|---|
| Academic Rank |  |  |  |  |  |  |
|    Associate Professor | x | x | x | x |  | x |
|    Assistant Professor |  |  |  |  | x |  |
| BS | In Asia | In Asia | In Asia | In Asia | In Asia | In Asia |
| MS | In Asia | In Asia |  | In Asia | In Asia | In Asia |
| PhD | In US | In US | In US | In US | In US | In US |
| Post Doc |  | In US | In US | In US |  | In US |
| Married | In US | In Asia | In US | In Asia | no | In Asia |
| Children | no | yes | yes | yes | no | yes |
| Mentors in Asia | no | no | Lived with 2 professors | no | During internship | During internship |
| Mentoring at The Ohio State University |  |  |  |  |  |  |
|    Assigned | yes | yes | yes | yes | yes | yes |
|    Number Assigned | 3 | 4 | 2 | 4 | 1 | 3 |
|    Women mentors | yes | yes | no | yes | yes | yes |
|    Asian mentors | no | yes | yes | no | yes | yes |
| Mentoring |  |  |  |  |  |  |
|    Career | yes | no | yes | yes | yes | yes |
|    P & T | yes | yes | yes | yes | yes | yes |
|    Work/life | yes | yes | no | yes | yes | yes |
|    Goal Setting | yes | yes | no | yes | no | yes |
|    Role models | no | no | yes | no | yes | yes |

Classmates, both in the U.S. and in Asia, influenced the career paths of four of the women interviewed. Personal conversations, phone calls and on-line chats were all methods used by these women to seek advice of peers. The peer mentoring of friendship circles described by Chesler and Chesler (2002) illustrate how peer mentoring and sharing difficulties with peers fills a mentoring need.

## Mentoring East Asian Women Scientists and Engineers

Each of the women interviewed had positive mentoring experiences in the U.S. They each benefited from the advice and counsel of faculty mentors as they conducted research, taught classes, and pursued tenure. At the time of the interviews, five of the six faculty were married and four had children and sought advice on family issues. The development of the mentoring relationships, while different, shared some common themes.

Only one of the six women initially asked the administration for assistance in establishing mentors. She understood that success in U.S. universities is affected by quality mentoring, but had no experience in forming mentoring relationships. The other five women interviewed were told they should have mentors by the department administration and had assistance in formalizing mentoring assignments. One woman had a single mentor, one had two mentors and the rest had a team of mentors. Kram (1985) introduces obstacles to successful mentoring, with one being the individual's assumptions, attitudes and skills. To overcome the obstacle of not being aware of the need to or not being prepared to establish a mentoring relationship, she suggests a formal mentoring program. Chesler and Chesler (2002) described collective mentoring by a team of mentors as being suitable for people of color. These approaches appear to fit with the experiences of this group of East Asian women. Five of the six women interviewed talked about their assigned mentoring teams.

All interviewees felt having a woman mentor was important and five of the six had women mentors. Some of those interviewed were the only women in their departments, but two of them found women mentors who had similar interests and work experiences in other departments. The protégées looked to women mentors for role modeling and for providing psychosocial mentoring. Gibson (2004) found a mentoring gender-gap and that male mentors were not seen as being able to address certain issues like work-life balance. Three of the women found women role models. Role modeling, as pointed out by Gang (2012) can be important in Asian mentoring models. Kram (1985) described role modeling as a psychosocial mentoring function, which can be very complex and limiting in cross-gender mentoring. Smith and others (2000) found role-modeling a common approach to mentoring among women and minorities and that they are accustomed to extending beyond department boundaries to find mentors.

The five women who were married and four who had children felt both family and cultural pressures to manage their career and family. They all found they needed mentoring to help them manage and find balance. This fits with Kram's (1985) model of both career and psychosocial mentoring.

Another contribution of the mentors was helping these Asian women set their own goals. Some had come from work and educational backgrounds where they were told what to do and had no opportunity to set goals for themselves. Often, their mentor was the first to ask them about their long-term goals. While four women said they struggled with this concept at first, they responded and were able to share their goals and how having them developed helped them manage their career. All four had goals that were not restricted to career, but often combined both career and psychosocial objectives.

During the interviews, East Asian women scientists and engineers were asked if they had Asian mentors. Four of the six women had Asian mentors but it was not clear that having Asian mentors was important. They all expressed their opinions that experience in the field of study was more important than national origin. The same mixed response to having a same race mentor was found in the limited published literature on mentoring East Asians (Sands et al. 1991; Liang et al. 2006). Three of the women had Asian mentors who had considerable experience working in the U.S. and were able to share their experience and provide encouragement.

## CONCLUSIONS AND RECOMMENDATIONS

The study's primary goal was to propose a framework for successful mentoring of East Asian women scientists and engineers at U.S. universities. This preliminary study found that these women come to the U.S. encouraged to pursue science and engineering. However, once they arrive, they feel isolated as an

East Asian and woman faculty member in science. The isolation is made worse by a lack of experience in developing mentoring relationships caused at least, in part, by their lack of experience seeking out mentors.

In the American university system, mentors are important for success in faculty career development. East Asian women would likely benefit from mentoring programs designed for women, and particularly for minority women. The level of mentoring experience should be taken into account when helping East Asian women science and engineering faculty find mentors. The isolation East Asian women may experience in coming, often alone, to the U.S. should be considered. To ensure productive mentoring of East Asian women science and engineering faculty, a framework for a four-part mentoring program is recommended.

1. Collective mentoring with administrative support should be practiced in mentoring East Asian women in science and engineering. While the women faculty should be active in identifying mentors, it should be clear that the resulting mentoring relationship is an expectation and assignment for both the protégé and the mentor.

2. At least one of the mentors should be a woman. In many science and engineering departments, a woman with suitably sufficient experience to serve as a mentor may not be available and pairing suitable mentors with protégées may need organizational support. Scientists or engineers from other departments may be assigned. A change in the faculty evaluation system, as suggested by Kram (1985) may be needed to encourage more senior women to mentor faculty in other departments and colleges.

3. Mentoring should include discussion of work/life balance. All faculty members, regardless of ethnicity or gender, confront some level of issues with balance in their lives. Some of the interviewed women found it difficult to talk to men about these issues. All mentors, men and women, need training in working with protégées in managing work/life balance.

4. Mentors should help protégées with goal setting. Some East Asian women scientists and engineers, especially from China, may have had little to no opportunity to make their own career choices. An important step in career development is setting goals and objectives. Mentors may need training in personal strategic planning to help them both model and guide protégées as they make decisions and set priorities.

Based on this small qualitative study, collective mentoring with administrative support could be a

model well suited to support career development for East Asian women science and engineering faculty. What was gleaned from this study may help with development of mentoring programs for all groups. Further study of East Asian women faculty at other universities who come to their faculty positions following different paths will add insight and may strengthen and add depth to the framework.

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