Women, Hi-Tech, and the Family-Career Conflict

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INTRODUCTION

This article focuses on female software engineers in the Israeli hi-tech industry. We describe findings of our research that was based on in-depth interviews with 17 female software engineers from four organizations of different kinds and sizes.

BACKGROUND

Software is developed by human beings, usually working in teams. Indeed, the professional literature addresses software teamwork, roles in software teams, and other related topics. For example, van Vliet (2000) discusses general principles for team organization, Hughes and Cotterell (2002) dedicate a full chapter of their book to people management and software team organization, and Humphrey (2000) describes a full software development process from a team perspective.

At the same time, however, our literature review indicates that the role of women in software teams has not been researched extensively. Moreover, although the underrepresentation of women in the IT field in general and as software engineers in particular is well documented (Camp, 1997, 2002; Hazzan & Levy, in press), only few studies deal specifically with women working in the software industry (Sosa, 2005; Turner, Bernt, & Pedora, 2002). Continuing this line, the present article focuses on women participation in software teams.

Women in the Information-Technology and Software Industry

The "shrinking pipeline" (Camp, 1997) describes a phenomenon related to women in computer science, according to which, in addition to the pipeline shrinking from high school to graduate school, the pipeline has been shrinking during the last 20 years at the bachelor's level. For example, in the United States, women currently receive less than 20% of all bachelor's degrees in computer science, compared with 37% in 1984. Camp argues that "[s]ince the number of women at the bachelor's level affects the number of women at levels higher in the pipeline and in the job market, these facts are of great concern" (p. 104). Following Camp's 1997 article, this topic received extensive attention (Camp, 2002; Margolis & Fisher, 2002).

Women in the Israeli Software Industry

Our article focuses on Israeli female software engineers. Thus, characteristics of the Israeli software industry are considered in our study as well. For this purpose, we will first briefly describe the Israeli hi-tech industry.[1]

Israel is a very small country with a population of about 7 million people. Still, at its hi-tech economic peak during the 1990s, Israel was one of the world's leading centers of technology start-ups and innovations. Despite its small population, Israel had at that time about 3,000 start-ups,[2] and it came in third (after the USA and Canada) on the list of countries with the highest number of companies listed on NASDAQ.

This blossoming is explained by two main factors. The first is the national security and military needs that led to the development of cutting-edge technologies. Since its establishment in 1948, Israel has been forced to invest huge budgets and efforts to maintain its military advantage in order to survive. In particular, designated army units exist that specialize in technological innovations. As it turns out,

many of Israeli's hi-tech entrepreneurs started their careers in the Israeli army.

The second factor that explains the success of the Israeli hi-tech industry in the 1990s is the massive immigration wave of Russian engineers from the former Soviet Union during the 1990-to-2000 decade. This addition of engineers to the Israeli population led Israel to have the highest number of engineers per capita in the world.[3]

One comprehensive, quantitative research on women in the Israeli hi-tech fields was conducted by Frenkel and Izraeli (in press). Among other things, they found that, on average, incomes of mothers who work in the Israeli hi-tech industry are higher than those of women who also work in this industry but are not mothers, mothers in this industry are more satisfied with their work than their nonmother counterparts, and the price that mothers in this industry pay is expressed mainly by higher levels of stress and the lack of leisure time. However, they concluded that the family-career combination is more rewarding than each one of them alone. It should be emphasized that this research was a quantitative study. The women who participated in it were approached through the Internet, and it included only those women who were still working in the hi-tech industry.

Our research findings, presented in the continuation of the article, show that this picture might be correct for those mothers who are still in the hi-tech industry (i.e., did not leave the hi-tech industry after they became mothers). As we shall see, the women who did leave the hi-tech industry after they became mothers (and therefore did not take part in the above-mentioned research) reveal another aspect of the picture: They left the hi-tech industry in their attempt to solve the family-career conflict.

Another major finding of Frenkel and Izraeli's (in press) research indicates a connection between the division of housework between the two spouses and the woman's success. Specifically, women who share the housework with their spouses earn more and are more satisfied with their jobs than women who "own" the housework. Our research refines this finding. Specifically, it indicates a link between the spouse's occupation, the ability of the two spouses to share the housework, and the female software engineer's course of promotion.

By using a qualitative research approach, as described in the next section, our research enables one to understand subtle details that clarify and shed additional light on the above-mentioned numerical data.

RESEARCH METHOD

Our qualitative research used in-depth interviews for data collection and inductive data analysis. Specifically, over the course of 6 months, between April and October 2004, we interviewed 17 female software engineers who work (or worked) at four hi-tech companies of different areas in the Israeli software industry. The women interviewed were very highly educated (three hold PhDs, six have MScs, and eight have BScs) and were at different stages of life: Two women were unmarried, three had no children, and the rest were married (to their first husband) with 2 to 4 children.

Each interview addressed the following main topics by referring to the following issues and additional relevant subjects that emerged during the interview.

- **Past:** How she became a software engineer
- **Present:**
  - **Current Present:** Daily schedule, tasks she is currently working on, what she might be doing if she were not talking to us at the moment
  - **Continuous Present:** Projects she is part of and her role in these projects, her work style, challenges in her work (professional, personal, social, cultural), conflicts she faces and how she bridges them, how she sees an ideal software development environment
- **Future:** How she envisions her future in the field
- **Teamwork:**
  - **Her Team:** Description of the team, the way it functions and her role in it, how she believes others perceive her, who decides on roles and work assignments in her team and according to what criteria