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TheMarker

Bug in the system: IDF is deterring female coders

Army insists it offers equal opportunity, but study finds its dog-eat-dog system of training sets women up for failure

Ruti Levy

Sports Day is a highlight in the Israel Defense Forces' Computer Science School, known by its Hebrew acronym Basmach. It is a display of flags and drums, chanted anthems and soldiers representing their groups in dodge-ball, soccer and volleyball. The colors on the trainees' epaulettes, distinguishing the different courses, seem to take on a life of their own: reds against yellows, blues against greens.

When Dr. Efrat Cohen-Touati asked one of the women how Sports Day had gone, she was told that the commander, also a woman, said, "Well done on winning, and well done that you didn't lose to the girls in the QA (software quality assurance) course."

Her nuances might be lost on the general public outside the technological world. Software development has a clear hierarchy: Programmers are at the top of the heap, and software testers are at the bottom. Meanwhile, in the world of sports, "girl" is an insult, as in "You run like a girl." Linking girls to the software testing course is an derogation that combines both worlds.

For a year and a half, Cohen-Touati observed the trainees in Basmach during class and physical training, events designed to build team spirit, and graduation ceremonies. The Sports Day anecdote gains meaning in view of her sociological research findings. But nothing prepared her for the shock of seeing the students' final grades.

"I ran statistical tests on the data again and again," she says. The results showed that while men and women began the course with similar grade averages, they ended far apart. Men got higher scores. The study also found a much higher dropout rate among women.

Programming is the elite course provided by Basmach, and the outcome Cohen-Touati observed seems surprising, given the care with which the Israel Defense Forces selects candidates for the course. Only the brightest make the grade.



Soldiers participating in Sport Day. Adi Emanuel/Getty Images IL

The general dropout rate from the course isn't especially high, about 6.5%. For comparison, the dropout rate from computer sciences at the universities is about 26%. But the dropout rate among women from the Israeli army's programming courses has ranged from 9% to 14%.

Stronger together

But then a strange thing happened, that even Basmach veterans can't remember the likes of: in two parallel courses, there were more women than men. The gap at the end between the sexes remained the same, but one thing changed: The overall dropout rate sank to about 4%, with the female rate moderating to about 7%, and no men quitting at all.

How does this gap between men and women with similar starting scores arise during school? And does a female majority improve their ability to survive the course?

It is in the army's interest to understand these distortions. It invests vast resources in placing and training its soldiers. Its courses have a limited number of places and their graduates are supposed to fulfill roles throughout the Israeli military structure.

Many studies investigate why women shy away from technological occupations, but Cohen-Touati studied those few women who did aspire to and reach technological training in the army, which made them different from most of their peers – only about 17% of the army's computer coders are female. Her study is unique in analyzing cases of success in real time, in an area to which few researchers can gain access.

Cohen-Touati is studying how curriculum structure and program can make it harder for women, and how interactions within and beyond the classroom – among trainees, and between them and instructors in army training – shape gender power relations.

Now the owner of the organizational consultancy Kognita, Cohen-Touati reached the topic after

working as a civilian employee of the army's ground forces training division.

"I was in the team working on writing specifications, development and integration processes for new means of war," she told TheMarker. "Over the years I noticed that the vast majority of the people at the discussions were men, while I and other women were there in categorically female capacities, such as training and human resources. I was told that the job of writing specs for weapons involves 'crawling beneath barbed wire,' meaning that field experience was necessary, but that didn't explain everything. The question that remained open was why women don't attend and participate in the technological aspects of the discussion. This research catches them at the start of the road and studies what turns them into a minority in the military technology system."

Wow, I'm a genius

Programmers, in high-tech or the army, work in teams towards a common goal. Each plays a key role in the team and success and failure are shared. But the first part of the Basmach programming course feels more like high school, with the trainees being reduced to marks on a relentless grading chart. The mood is competitive and in general, helps men stand out and makes women wilt.

The grades enormously influence the division of labor, and the roles that the trainees are given in the course, and they create a professional hierarchy among the students. Ironically, the key concept that defines the division of roles by achievement is called MAN.

A table hanging on the bulletin board in the corridor shows the division of the trainees into teams for training, with each trainee being allocated a job in the team based on professional level, classified from MAN 1 to MAN 6.

In fact, all the terminology in the course is oriented towards competition and achievement. Exercises where the students work individually on computers are referred to as "running exercises" and the main tests are called "rank examinations" to describe a ramp-up in difficulty and complexity.

"If you finish the exercise or test faster, you're considered more professional, and women shrink from environments like that," says Cohen-Touati. "Throughout, the students are shown who is considered stronger and who weaker. One of the girls said they were allowed to talk after they finished the exercise, so the boys start talking,

saying things like they'd finished ages ago."

Cohen-Touati describes the men in the courses as vocal, taking pride in their achievements out loud, while the women were hesitant about sharing their successes, lest they be perceived as conceited.

"It's easier for boys to say, 'I beat you, wow, I'm a genius, which of us got a better grade?' They like to compare," says Lior, a female trainee. "We girls talk about grades among ourselves, but in a more considerate way. ... It isn't nice to brag to people who aren't doing well. It stresses them."

Avoiding dwelling on their achievements precludes their professional exposure to the environment, making it harder to stand out. From time to time, friendship causes them to struggle against their image as a weak group: "My friend received a high grade but didn't tell anyone," says Keren. "So I



Cohen-Touati Megeg Goczny

'It's like a game, with the boys all bragging and one silent player, and nobody knows if she's good or not.'

went to brag on her behalf. It's like a game, with the boys all bragging and one silent player, and nobody knows if she's good or not. As a girl, I felt I had to publicize it."

Jonathan, a trainer in the course, gives Cohen-Touati his perspective on the social dynamics in the course. "A lot of the students are competitive, but I think the girls' motivation stems from a place that's less competitive and more about personal development. If they appeal a grade, they want to know where they were wrong."

But the greater dropout rate of women isn't only due to the competitive atmosphere in the course. It's also a function of objective, substantive differences in prior knowledge.

Of the 34 people that Cohen-Touati interviewed, only one third of the women had previous background, compared with 100% of the men. "The boys already know



Male and female soldiers at work in an IDF cyber-warefare unit.

IDF Spokesman

the algorithmics, the logic, how to think," says Hadas, a trainee.

The Basmach programming course is a pre-army format, which among other things means the soldier commits to serving a minimum of six years (rather than the standard two or three). Nor does the time spent there count in the future soldier's conscription commitment. It lasts 25 weeks, and the learning is demanding and intensive.

Although Stage 1, the first half of the training, is supposed to acclimatize the students, in practice the course's breakneck pace and heavy load are much harder for people without prior knowledge, resulting in divisions by status. Academic studies have shown that in public situations like conferences and seminars, women in general are less visible and ask fewer questions than men, but when they do ask, their questions tend to seek understanding more than the men's.

In the context of the Israeli army software course, "understanding" questions are more commonly asked by the women and are perceived negatively, as holding up the class. The men are associated more with forward-looking questions relating to the implications of the subject matter being taught on other knowledge. In the course, these questions are associated with wisdom, speed, creativity and advancing the class.

"You are measured by how many questions you ask in the classroom," says Tamar. "If you ask questions of understanding, it means that you are struggling, and you will be perceived as not smart enough."

Cohen-Touati believes that the pedagogical structure of the course does not confer equal opportunity for the sexes, being much more suitable to the way men prefer to study. The second part of the course is more appropriate to the way women take interest, think and study – with theoretical examples; connecting to reality; less basing the lessons on foreknowledge; teamwork on projects; and deepening personal acquaintance between the trainees

and the staff. However, this arrives too late: Most of the female dropouts leave in the first part.

"There are tests showing that when the aptitude institutions start with math testing before verbal testing, it completely changes the women's grades [for the worse]. They start off with out confidence," says Cohen-Touati.

"That can only change if the institutions reverse the order, or create an experience of success for the women, she maintains. "Stanford managed to increase the number of female students in computer sciences from 12% to 30% through a relatively small change – they developed an introductory course for the inexperienced, which stressed collaborative learning. Changes of the sort could lower women's dropout rates."

Bucking the current

Part of the explanation for the high dropout rate among women stems from the different social support that women and men receive in the army, and the alternatives they believe are open to them if they fail.

"The narratives that men and women tell themselves at the beginning of the course are significantly different," says Cohen-Touati. "With men, the ethos switches: Service as a programmer is just as prestigious as combat."

But for women, programming is still an unusual choice and is perceived as bucking the current. Their friends don't get them. They press, "Why commit to six years of army? That's eons. When I'll be long after the post-army trip abroad [an Israeli custom] and go to study at university, you'll still be in the army."

Another aspect of the dropout rate, says Cohen-Touati, has to do with the alternative scenarios the women imagine for themselves during the training course. To diminish the stress of competition, they comfort themselves that it's a pre-army course anyway and if they don't make it, they have plenty of options – such as

cleaning duty is voluntary. It isn't managed by the staff and no one gains credit. And the men don't do it.

"There's one major cleaning rotation once a week, and cleaning duty for the toilets and the classrooms on a daily basis," Aviv tells Cohen-Touati. "The boys are too lazy. They do nothing but sit back and wait [for somebody else to do it]."

Jonathan the teacher admits that more boys than girls shirk cleaning duty, but insists that it isn't only girls who clean – and yet, he qualifies immediately – "Sometimes the girls clean more. You can tell that by who shows up to ask for a mop. The class is full of boys, but it's the girl who comes to ask."

The training in the course was equal-opportunity, says Cohen-Touati. "It's liberal feminism at its finest. But that turns out not to suffice in some places, and even shut the women out. In cases like that, what's needed is practices that aren't gender-neutral, but that women prefer, that would create a better learning environment for them. What mainly bothers women isn't whether there are a lot of men in the course, but that there are few women to talk to and forge friendships with, to support each other."

The IDF spokesman commented that men and women serve alongside one another in compliance with the law. "Placements within the army are based on necessity: the army's needs and the aptitude of the individual, not gender. The IDF adheres to equal opportunity for all sexes and communities, alongside personal excellence and professionalism."

"The school consistently updates its teaching methods," the spokesman continues, adding that "new qualitative trainee evaluation methods have been introduced during the last year, which test comprehension by setting personal goals for progress. The school also scaled back its use of quantitative grades. Its system includes independent and team study, and in small groups, all of which have reduced the dropout rate."

The male trainees also set the rules when it comes to cleaning. Both genders are supposed to do cleaning duty. But unlike the study missions, which are constantly evaluated and which affect survival in the course,

Teva rises on forecast of 'strong launch' for Ajovy

Yoram Gabison

Teva Pharmaceuticals shares rallied Thursday after the drugmaker far exceeded Wall Street's expectations for third-quarter profits and forecast "a very strong launch" for its long-awaited Ajovy migraine treatment.

The company added that it expected to launch its generic version of the best-selling EpiPen allergy treatment in the current quarter.

The combined news lifted Teva shares 9.9% in Tel Aviv Stock Exchange trading to end at 81.61 shekels (\$22.05).

Teva earned \$698 million, or 68 cents a share, excluding one-time items, down from \$1.00 a year earlier. Revenue fell 19% to \$4.53 billion as its top-selling Copaxone multiple sclerosis treatment was hit by generic competition. Lower prices for U.S. generics and a loss of revenue from the sale of some of its product

lines and discontinued operations also weighed on sales.

But the results equaled or exceeded analysts' forecasts of earnings per share of 54 cents on revenue of \$4.53 billion, according to I/B/E/S data from Refinitiv. Moreover, Teva raised its full-year forecast for adjusted EPS to \$2.80-\$2.95, from a previous estimate of \$2.55-\$2.80.

CEO Kare Schultz, who came to Teva a year ago with the task of turning the troubled company around, sought to alleviate concerns about some initial setbacks for Ajovy.

"We're seeing a very strong launch of Ajovy. There is strong acceptance, including the quarterly dosing," he told a conference call, noting that the drug offers users quarterly and monthly injection options, while competitors have only monthly.

Express Scripts, one of



Kare Schultz

the largest U.S. prescription benefits managers, said last month it would cover new migraine drugs from Eli Lilly and Amgen only. But Schultz told Reuters that talks with Express Scripts and others were still ongoing.

Regarding EpiPen, he said: "We will be launching in the U.S. in the fourth quarter and then increasing supplies to the market throughout next year."

FAKE

Continued from page 14

generate as they calculate away, so that extra power is required to keep them cool.

Bitcoin miners are such electricity hogs that they can create local power shortages and raise electricity rates for their neighbors.

In a study published earlier this year, economist Alex de Vries forecast that Bitcoin would be consuming 7.67 gigawatts, or 0.5% of the world's electricity, perhaps as early as the end of 2018. If the price of bitcoin continues to increase the way many have predicted, thereby attracting more and more miners, bitcoin could someday consume 5% of the world's electricity.

"To me, half a percent is already quite shocking. It's an extreme difference compared to the regular financial system, and this increasing electricity demand is definitely not going to help us reach our climate

goals," de Vries says.

De Vries is right to be worried: The study published Monday in Nature Climate Change estimated that the use of bitcoins in the year 2017 emitted 69 million metric tons of carbon dioxide. It could wind up consuming so much power that it significantly contributes to global warming.

Indeed, the researchers predicted that if the take-up of bitcoin occurs at a similar rate to other technologies the cryptocurrency by itself could produce enough emissions to raise global temperatures by two degrees Celsius by as early as 2033.

It doesn't sound like much, but the two-degree mark is regarded as the point where climate change becomes dangerous. Much of the world, including its present "breadbasket region," will be a lot drier at a severe cost to ecosystems, agriculture and infrastructure. On the upside, my guess is that bitcoin will probably never gain the kind of traction it needs to become such an environmental threat.

Either the attraction of

cryptocurrencies will fade as people come to recognize that like the Pet Rock of the 1970s, they are a solution to a problem that doesn't really exist, or governments are forced to step in to halt the squandering of energy. Even the Trump administration, which dismisses climate change as fake news, won't appreciate the demands bitcoin mining makes on the power grid and will act if it becomes a real threat.

The bitcoin phenomenon reminds me of the 1960s-era "Whole Earth Catalog," which dismisses climate change as fake news, won't appreciate the demands bitcoin mining makes on the power grid and will act if it becomes a real threat.

The world is growing more reliant on technology, and far from liberating humankind from centralized power, for better or for worse it is drawing us closer to it by making us more reliant on the network than ever. Even if it were to succeed, bitcoin would only contribute to the trend.

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