

## Climate for women in Science: a lifecycle approach

By Caroline Nevejan

### Introduction

When I was asked to give this lecture, I hesitated at first. Talking about women's issues one is easily misunderstood or labelled in a variety of ways and possibly judged on false grounds. Nevertheless, women's issues are dear to me. From experience I know that being a woman in professional and technology environments has its specific ups and downs and recognizing these makes a difference in one's ability to deal with them. So actually I am grateful for being given the opportunity to reflect with you on the Climate for Women in Science.

The first hurdle I have to take is to define which tone I will choose to use. How personal, how political, how analytical I want to be in the coming 30 minutes. What will inspire you most? Given the fact that we all gathered on this 8<sup>th</sup> of March shows that all of you have an awareness of the importance of women's issues in the technological climate Delft Technical University offers. How should we approach women's issues, given the fact that whole libraries have been written about these issues already and still the issues are here? How can we formulate questions so we can be curious again and use our creativity to deal with what we actually face?

In my search to find interesting questions my perspective is defined by the world I know best, which is the world of North West Europe. Its rich societies offer a very different social climate for women than for example India does. Also I am a white middleclass woman, which deeply affects my perception as well. Nevertheless, I am an independent woman who managed to make a career in the world of Internet, New Media and ICT. I was making shows in Paradiso in Amsterdam about the rising network society end of the 1980's early 1990's, co-founded and directed Waag Society, an independent media-lab and was part of the Doors of Perception Design network during the 1990's. In 2001 I became director Educational Research and Development at the Hogeschool of Amsterdam working on new learning environments. Only 5 years ago I re-entered the world of science and academia. In 2007 I defended my dissertation Presence and the Design of Trust at the University of Amsterdam and since 2010 I work here at Delft Technical University with Frances Brazier in the department of Dynamic Adaptive Systems Design.

Careers are not solo adventures; with generous help from family, friends and colleagues I found the inspiration and the perseverance to be able to do so. Throughout my career I have discussed situations with women friends exchanging stories of how we deal with what we face. Despite the fact that we realized that politically we are living in a male dominated professional world, we mostly understand issues as personal situations we have to deal with. Balancing between autonomy and adaptation, we focus on how to orchestrate our own psychological processes to be better prepared to deal with what we face: finding courage, nourishing self esteem, taking responsibility, learning to enjoy one's achievements, accepting negotiation, dealing with conflicts and much more.

## **The personal is political**

To answer the question “How can we formulate questions so can we be curious and use our creativity to deal with what we actually face?” I go back to the 1970's. At the time there was a classical saying that captured the thinking at the time. It was “the personal is political” and this facilitated a lot of women to identify issues at stake. When growing up in a culture its habits and perceptions are easily taken as the natural order of things, while they actually reflect specific interests and power relations that do not want to be challenged. Questioning what seems natural is very hard to do. Feelings of injustice and discomfort may be clear indicators that something is wrong, but to realize this on an individual level in personal circumstances requires a self-confidence that is hard to maintain when operating alone. Through sharing such feelings and through rigorous analysis as well, feminists in the 1970's and 1980's made the large step from the personal to the political.

As result, women's emancipation and participation became part of many social, political and economical agenda's and many policies were put into place in education, in healthcare, in social and economical organizations. Thanks to women's generations before, young women today have chances our mother and grandmothers did not have.

Young women often do not realize the fights that were necessary for things that seem natural today. The flipside of the same coin is that it is hard for them to realize and recognize their own fights they have to face. In media and public discourse women's issues are not 'cool'. If you do not manage to make the career you seek or get the respect of colleagues you need, look attractive and keep your energy at all times, it is a personal problem. Here the classical saying “ the personal is political” resonates. Is it because of personal issues that only 20 % of students at the TU Delft is a woman? That only 12 % of Dutch professors is a woman? That on average, women earn 20% less than then their male colleagues do?

The 1970's saying “the personal is political”, reflected mostly political action and analysis, which gave a lot of women in the western world (and beyond) courage to break the silence and speak up. Today, in our highly individualized global media societies, analysing numbers and power relations is not sufficient enough for organizing efficient interventions. One has to understand psychological processes of men and women to be able to understand the complex dynamics to which both men and women contribute. Indeed, we still need more political change because despite of 30 years of effort, the numbers are not right yet. In my perception some of the resistance of both men and women to commit to such change, has to do with the new psychological and sociological structures that have emerged because women are significantly more participating in public life than before. The path of change is full of thresholds that have to be overcome and it seems to me that we are at such a threshold right now. Both at home and in the workplace relations are changing and this requires an adaptation of personal psychological balances for both men and women alike. The Personal is Political refers to a complex dynamic in which politics affect social structures, which affect personal psychologies, which affect social structures and politics again.

To find a perspective on my question “How can we formulate questions so we can we be curious again and use our creativity to deal with what we actually face?” I want to focus on these psychological processes by taking the perspective of the individual human being and show how psychological, sociological and political processes affect woman's growth and potential in different phases of life. Building on the concept of the “lifecycle approach” as developed by Cecilia Castano and Juliet Webster, at the Open Universidad de Catalunya, I will discuss phases in a woman's life and identify psychological moments that are distinct. In this effort I focus specifically on how women deal with technology, skills and abstract thinking.

## Childhood

When discussing the future of learning in 2003, Mario Tokoro, director of Sony Research at the time, posed significant question. Can a child understand water if she has never had the experience of putting her finger under the faucet and let the water pass by? Pointing to the fact that real experience needs to precede representations for it to make sense, one can also raise the question which experiences are necessary for abstract thinking to emerge. Physical experiences shape girls and boys into who they are. Which experiences do children need to have to develop technical and abstract skills later in life? Curricula of primary and secondary schools are mostly defined by cognitive understanding. Living on a farm or a boat, a child may learn basic skills of water, fire and materials. Most children live in cities though where milk comes from the supermarket. City children hardly have formative experiences in dealing with nature and its forces. Learning by doing is fundamental to the acquisition of technical skills, so here a first requirement surfaces. Girls, like boys, need to interact with nature and learn to know their own force in relation to nature to be able to handle nature, and the technologies that come with it later in life.

For abstract thinking imagination is fundamental and this has to be nurtured already early on in life. In feminist literature there is a lot of emphasis that girls need role models in their direct environment to be able to identify with women who are capable and knowledgeable, women who dare to touch technologies and have technical skills. Imagination should also be nurtured in children's literature, films and games, but most heroes are boys with Pipi Longstockings, Matilda and a few others to be pleasurable exceptions. Stories with girls as heroes and girls as scientific savvy creatures are important because they encourage girls to expand their sense of self.

According to Antonio Damasio the making of images is part of the core functioning of the brain to which three states are crucial: to be awake, mind and self. Classical role models require girls to limit their sense of self early on in life while also young girls should be appreciated for their girl's clarity of mind. In classical role models young girls have to be pretty, giggle and quietly playing along, helping out in the home. Boys should be wild; girls should behave. Even though in many families and schools this classical pattern is challenged, as it was in my own, early on in life children pick up these roles and boys who are quiet and girls who are wild have a hard time.

This leads to another requirement in the formative years of childhood. Girls need to find an attitude to the fact that they are girls. Not yet in puberty, they are already socialized as girls. Without a sense of women's history, women's skills and women's knowledge, this labelling as a girl feels like a diminishment. Where on the one hand girls have to feel that they are equal to boys, they also have to develop a sense of proud to be a girl. Access to a women's way of being in the world, from going to the Hamam, playing with make up, learning about herbs and cooking, becoming part of women's stories, discovering the magic of female-hood will give them, apart from pleasure, a sense of identity that is needed to be able to deal with issues they have to face later in life.

How can Delft Technical University contribute to nurturing girls' scientific education in those formative years of childhood? By developing tools for playgrounds in which meeting your own strength and clarity of mind is crucial. By developing to stories in all fields of science in which women's history, skills and knowledge resonate and these can be the foundation for developing scientific communities of girls online. Or by developing of a mentor system in which TU Delft students guide girls who want to come here and learn about sciences. This grants us with the possibility to meet new generation of girls and women early on.

## **Growing up to be woman (15-25)**

The changes in body, the growth of cognitive and emotional skills and the discovery of sexuality define the formative years between 15 and 25. In those years boys and girls shape the starting position for their adult life. For boys and girls these are confusing years. Focusing on girls there is a whole new awareness needed to be able to surf these waves of change. At school the social order between boys and girls starts to be defined by being wanted, being cool and falling in love. Classical role models in which smart girls try to hide their intelligence, are thrown out of groups and retreat, and in which wild girls are badly commented upon, happen all around.

At the same time when becoming a young woman, also older men start behaving differently to you. Suddenly there is interest and attention from unexpected subjects; smiles, whistles and kind gestures are all around. This new male attention can be fun; it can be used and enjoyed, provided one feels good in one's own life. Developing your own sexuality in a free and safe way, developing the humour to play with it and discarding all the prejudices it may trigger, helps women to be well in their lives.

In these years most women also find that this male attention has a flipside as well. Any girl, classically beautiful or not, who takes care of her looks, has to face the fact of having become prey. Going home alone in the evenings and traveling around becomes an issue. Mothers, aunties and older sisters try to warn you, but in my experience this did not work. I was growing up and wanted to move around in the world and so did my daughter. So you learn the hard way that as a woman you always have to take care.

Things get even more complicated when this attention starts coming from teachers and professors. Being open, as any learning process requires you to be, it is a shocking experience when suddenly a professor's attention is not geared towards your intellectual potential, but wants to 'have' you as a woman. The strange side effect of such an experience is that girls start to doubt their own capacity. "His attention is for my body, so my work is not good enough." And only seconds later the conclusion is drawn "I am not good enough". As with most cases of sexual assault, guilt is the first reaction to such an event. It is not easy to talk about. It takes some good women friends who help you tell the story and help to understand what happened. It is not the girl that was out of line; it is the professor.

Like most of us I distinctly remember the confusion, remember how it made me wild, how it made me scared. I also remember how it made me self-conscious, making decisions about how and who I want to be in life. Earlier developed imagination and presence of role models around you of women who have managed to make unexpected careers, who are intellectual successful women, really makes a difference.

This step of accepting your own being and being self-conscious about it, seems to be a requirement to successfully enter the world of science. I know it from myself and my generation and I see it today in the generation of my daughter as well. Especially since the time to study has become so restricted and students have to be efficient in their efforts, knowing who you are at a fundamental level is crucial for success in scientific and academic studies. When you are not clear about yourself, intellectual effort can be confusing or alienating. The value of gap-years has increased since study time is limited. Doing all kind of jobs gives girls a sense of value and insight in their own capacity. One's 'having found one's self' intellectual training becomes a challenge and delight and women's potential grows.

Once enrolled in university many women have to face the changing position in the social structures one is part of. If one is the first woman in a family who attends higher education, this influences relations and easily isolation is the result. Mothers, sisters and aunts may not

understand what you do and feel alienated. Fathers, uncles and brothers may feel threatened. In the private sphere, next to getting praise and appreciation, becoming a scientist may have repercussions. To find one's voice, and finding the courage to speak out loud, is not easy. For me the years at university were a constant training in how to find my voice while combining academic, political and family cultures in my work.

When discussing Climate for Women in Science the strange thing for me is that, even though I am now 52 and have quite some life experience, some of the issues mentioned above are still relevant in my day to day functioning here at Delft. I regularly doubt my own capacity and I regularly have to reflect to find my voice and to keep my self-consciousness alive. Somehow the grind of mixing sexual identity, classical role models and intellectual capacity is very destructive and its reminiscences I still face today. The sentence "I have the ambition to significantly contribute to science", I can hardly speak out loud. The way out for me in this dilemma is my inner drive to want to do this, using all the women survival skills I have learned so far. And also I have the privilege of collaborating with a woman professor, who knows about women's histories and ways of working, so she grants me the space in which my potential can unfold.

What can TU Delft do?

Integrate women's history, skills and knowledge in research paradigm's

Mentoring role models, older women talk to younger women about being an intellectual woman (even school visits could be made)

Deliberately creating women's perspectives in research and presentation

More women professors and teachers on Campus

Gender balance in courses

Effective continuous campaign against sexual harassment

Supporting women in understanding their own emotional processes to develop and sustain self-consciousness.

### **Being a professional woman (25 – 50)**

Looking back at my own career in the last 25 years, while raising my daughter mostly alone, I do not know how I handled it anymore. There were many moments of confusion, of choices I just took, of ethics I hang on to, of conflicts I tried to evade and then had to confront anyway, of deciding what to let go wrong. And there were many moments of great joy, of inspiration, happy collaborations, of moments of work in which all came together. I know that in all those moments my being a woman made a difference. Even when collaborating in androgen ways, enjoying full partnership with men I collaborated with, the fact that I am a woman makes no difference and all the difference all the time.

As most of us I had to face the classical issues: working hours that permit care for family life, proof that I did enough working hours (never say you go home, just say you have a meeting), fights for day care (which I won because there was a woman on the board), fights for pay, fights to hire more women, fights for getting respect. I had to learn to manage my emotions and strategically operate. I had to learn that every organization has its own rhythm and culture and find my place in there. Also I had to learn to get dirty hands, make mistakes and accept the consequences.

Fundamental in many instances was the fact that I, and many women friends with me, feel we have to do a 'good job'. This wanting to do well, is partly inspired by the fact that women have to prove they can do the job to others, but mostly to themselves. Generally speaking women perform well, which is why some enlightened managers will try to get as many women in their company as possible. However, this sense of having to achieve more and more, be perfect at home, at work, as a mother, with friends etc. is killing for our soul. Till today the finding of the balance between all these identities is a constant part of conversations I have. To me personally it is strange that some women opinion leaders express loud judgements on how other women should live their life. Here I am happy to have been inspired by a long tradition of women in my family and beyond, that nurtures women's souls as well. There are times to work and times to rest. Nevertheless, I do find that to participate as a woman in professional realms, one has to tackle some old psychological restraints. I will highlight these with some examples.

When I was making programs in Paradiso I would always pay attention to have lots of women on the podium next to men. But every woman I would ask to speak up, would always recommend some other person and in the end I found that getting a woman on stage costs three times the trouble to a man. Men will say yes in the first phone call, even if they do not know yet what to expect, they trust they will get through. Women need assurance that they really need to do it, that no one else can do it like they can. Why is it that many women have a hard time speaking up in public spaces?

In another context, at the Hogeschool van Amsterdam, I noticed a similar effect with much more dramatic consequences. We were working there with over a dozen female directors of different institutes and staff services. Faced with a bad manager, who clearly disliked women professionals, we did not know how to organize ourselves in such a way that we could prevent this man from firing us. All issues that each of us had with this man, were first understood in personal ways triggering the woman to work harder. We did meet amongst ourselves while this process was going on, but most of us felt that speaking up as women would degrade professional skills. This was a very shocking experience to me. Out of fear for being assaulted professionally, we were not able to make the political judgement to get rid of the guy. When my women colleagues made this judgement, I took a different decision and went to fight him openly. We had a major clash and I left with honours. Some of the other women fought one by one in silence and within the year after I left, most were fired in nasty and not fair ways.

Before being able to do the more mundane fights for day cares, salary and respect, women have to feel the right to attack. Sometimes because of naive trust, sometimes because of fear of exclusion or of possible loss of authority, women do not make the personal political and fight for their rights. There is a reason why we do so. We know that such fights will have social repercussions and to face social exclusion, or false judgements, is a really bad experience. Also, because we have this long history of women's subordination, we all have skills to do our own thing anyway and make some of those fights not important at all. That is why I agree with Karel Luyben that the highest levels in an organization should support a good Climate for Women in Science. Such support should focus on changing cultures: by adapting formal structures and organizing networks like DEWIS does.

By the time I started to realize the simple dichotomy between men and women in a large professional organization, early 40's, I thought it was a kind of a lame situation and I decided to break the frames. I started to train and learn to deal with my knowledge and emotions in other ways, not focusing on adaptation but on giving full space to my inner images and autonomy. At the same time I picked up an old dream of doing a theoretical PhD. And here I

am 5 years later talking to you about Climate for Women in Science at Delft Technical University.

I wish all women in our university would be trained in such skills for integrating knowledge and feelings to influence psychological choices that are made which affect future potential significantly. Actually it would be good for the boys as well. And of course a series of practical and social support services should be there, glass ceilings should be removed, stereotypes should be undermined. A good climate for me as a woman in science allows my being to be there with the child in my chest, the young, the professional and the aging woman in my body. My being is human and my being is woman and needs trusted spaces and interaction to grow so I can share my best with all of you.

### **To conclude**

Since the 1970's the communication domain has changed profoundly and any new discourse has to take this into account. Millions of women partake in social networks where many personal stories are shared. All the writing in the global diaries of Facebook or Linked In, create a platform of action and analysis, be it an analysis that may not be recognized as one. It is more like personal action research, where the formulation of the state of affairs is connected to intended change in personal circumstances. Because millions of women now participate, such many individual changes will benefit awareness and change at large. New generations of girls and women from all over the world connect and interact.

So lets exchange experiences, formulate values and futures we like, become aware of womanhood, enjoy and include the men, do the fights we need to do, take lawyers when we need them, support each other when we can, read books and listen to music for inspiration and like we take care of life, also embrace science with all our heart to create this good climate in science for us and all the girls and boys yet to come.

Thank you