The mind of a technopreneuress: differentiating the self-leading, entrepreneurial from custodial, managerial female

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Abstract

One emerging trend in the 21st Century is the rise in the roles of women in society. In Singapore, increasingly women are filling-up not just the mundane, clerical ranks or the executive, managerial positions but also emerging as entrepreneurs. Or as coined by us as ‘technopreneuress’. For most interestingly, according to recent statistics, women are emerging as technologically more competent than before. In this paper, we explore the inner processes of the psychological adaptation and changes necessary in the female psyche before a societal, technopreneurial matriarchy may take root. Already, politically we witness the rise of women leaders in South East Asia: Megawati in Indonesia, Arroyo in Philippines and possibly in post-Bush US, the rise of Mrs Clinton. We structured our empirical investigations to focus on those personal traits, interpersonal and leadership styles that differentiate women as self-leading ‘technopreneuress’, i.e. the entrepreneurial from the managerial. We conclude by integrating our research findings with left–right brain attributes and on the future mind of the successful, technology-oriented entrepreneur.

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Keywords: Technopreneuress; Entrepreneur; Technology; Singapore; Women; Management

1. Introduction

In an earlier paper (Foo and Foo, 2000) we document the process of socialization of technopreneurism within Singapore. Here we extend upon the earlier work by narrowing our investigation to the female gender. We explore here whether in the near future—and in Singapore in particular—we may witness a possible emergence of ‘technopreneurial matriarchy’ within our Asian society. Although women are still evidently lagging behind men in corporate, political and societal roles, we are witnessing a rise of female leaderships inside South East Asia. For example, the emergence of women as Presidents: Megawati in Indonesia and Arroyo in Philippines; both daughters of dead but known politicians.

Their presence on the political stage may stimulate even more Asian women to take on leadership roles. Entrepreneurial roles are also leadership in nature. Even in the US we may speculate in the post-Bush era, the coming into power of Mrs Clinton. If so this may spur an even broader tendency among women across the globe to lead in enterprises. Yet despite these trends, there is still paucity of empirically grounded works and especially on the role of the Asian woman in entrepreneurial studies.

Why do we use the term ‘technopreneurial’?

This is mainly due to our social findings (see Section 2) elicited from published statistical data by the Ministry of Manpower in Singapore. Data over the last decade suggest a rise in the roles of women becoming professionally, more technically involved. By the term matriarchy we mean an enhanced or even growing dominant role in females leading successful entrepreneurial firms.

We approach this mainly through investigating by empirical means the key attributes that differentiate the female entrepreneurial CEOs (in our case, ‘technopreneuress’) from the managerial or executive. From detailed statistical analyses of inter-relational attributes, personality traits and leadership styles, we then generalize from these a painting in broad brushstrokes, the mind of a technopreneuress (see later discussion). In the process too, we relate our empirical results to the popular left–right brained dichotomy that explains behavioral characteristics. In summing up we discuss the making of a successful entrepreneur.
2. Society in transition

Over the last decade from 1989 to 1999 Singapore had witnessed a general skill transformation for both sexes. This is mirrored in the statistics published by the Ministry of Manpower in 2000 (Fig. 1). Interestingly, to begin with the statistics (1989) tell us that the percentage of the unskilled is actually lower for the female Singaporeans as compared to the male (43% vs 51.8%). Then over the 10-years period, the percentage of the male unskilled fell from 51.8% (1989) to 22% (1999). The story is repeated for female unskilled with 43% falling to 21.9%. In other words, socially now, in terms of proportions the unskilled women are more or less the same as men—before men were higher!

For the semi-skilled, male semi-skilled at 28.4% (1989) had scaled up upwards to 42.5% (1999) whilst the female semi-skilled began at a higher base of 37.1% too had enhanced themselves to a higher, overall percentage of 44.6%. Most interestingly of all is what in the skilled category. This is defined educationally as having post-secondary and tertiary training and education. There the changes are the almost identical transformation for both sexes: males, at 19.8% transforming to 35.5% whilst females, 19.9% changing to 33.5%. But this aggregate level pattern of seemingly similarity in change masks rather unveils the dynamic of change for the sexes.

The truly dramatic transformation is in the enhanced numbers of women in skills critical to emergence of a technopreneurial class: enterprise-related, corporate skills in managing and of technology, IT-driven talents and skills. Thus drawing on recently available statistics (Fig. 2): numbers of corporate female managers almost tripled (10400–30700), also for female engineering, IT and physical sciences personnel (7500–22600) and technically associated professions (11500–15800). Percentage share wise, the picture remains largely consistent of an enhanced female role. Share for women as corporate managers rose from 18.6 to 27% (8.4%), for core engineering, IT and physical sciences professions, a marginal increase in terms of percentage share from 22.3 to 22.5% (i.e. +0.02%) and for technically associated professions, a decline in percentage share from 19.1 to 15.5% (i.e. −4.6%).

Given these societal trends, we therefore are keen to explore broadly the social, contextual and personal factors and particularly the psychological mindset necessary for a technopreneurial matriarchy to emerge out of the society of Singapore. Singapore is chosen for the very reason that the government is now creating a national environment that is conducive for technopreneurs to strive, thrive and hopefully succeed. Our study contributes to the literature by our gender focus in differentiating the ‘technopreneuress’ from the managerial women.

3. The making of a ‘technopreneuress’

In the process of developing our instruments, we raise some of these queries. Some are suggested by the literature...
whilst others arose from our discussion. Broadly our hypothesis may be put down simply as:

*Is the technopreneuress different?*

These are some of the questions that helped us in narrowing down the scope of our empirical inquiry:

**Research questions**

- What does it takes to transform a female manager on regular, paid salary to become an energetic, creative, enterprising and technology savvy technopreneuress?
- Or to become a female with all the necessary entrepreneurial acumen and skills (Bird, 1989), one able to exploit the market potential in technology-related products.
- Why are some women pursuing self-employment (Richard and Dolinsky, 1998) rather than stay on as the employed manager or managerial woman (Henning and Jardim, 1977)?
- What are the personality traits that mark out females with entrepreneurial qualities—in terms of innate, personal attributes born or are acquired (Chell et al., 1991; DeCarlo and Lyons, 1979)?
- We ask, if it is at all possible to identify the potential technopreneuress? Through say, knowing their personal characteristics
- Is there a leadership side to becoming a technopreneuress? (McClelland and Boyatzis, 1982; Northouse Peter, 1997). For entrepreneurial leadership is often quoted as the reason why enterprises succeed.

The above questions are illustrative also of the range of issues that motivated us to make this journey. We turn to discuss in detail our methodology and we hope that researchers elsewhere may replicate our work.

### 4. Methodology

#### 4.1. Data collection and sample

Our focus is to study successful women, defined by us as women who are in executive, managerial and self-starting entrepreneurs. Indeed our letter of introduction is headed as ‘Asian Business Women Success Survey’. In Section 1, we requested the respondent who was informed that she had been specially selected ['You had been specially selected to be part of our sample'] to spare but only 5 min of her time. Also we assured the respondent of her anonymity and provided a self-addressed envelope for her easy return of the completed questionnaire. The respondent may if she so chooses to fax her return directly to us.

The critical part of our invitation read as:

> ...to study on successful women as leaders. We wish to contribute to a deeper understanding of the forces that shape successes especially of Asian women in business.

We also promised to provide the respondent with a one-page summary of our main findings.

Our data is collected via a carefully developed, pre-tested instrument that is sub-divided into three major, multi-item segments (interpersonal, management styles and personal traits) and a concluding section about personal background and history. We employ Likert-type scales (anchored on ‘strongly disagree’ (1), ‘neutral’ (3) and ‘strongly agree’ (5). For example in the segment titled ‘Interpersonal Style’,

![Fig. 2. Number and share of women in male-dominated occupations.](image-url)
5. Profiles

5.1. Entrepreneurial vs managerial

We contrast the two samples of the entrepreneurial vs the managerial across a number interesting attributes (Table 1): age, marital status, education, parental influence and expectation, number of siblings, years of working experience and the nature of father’s job. Descriptively, the female entrepreneurial class differentiates themselves from the managerial more across these attributes:

(a) they are generally older (47.4% more > 40 years old as compared to only 12.9%);
(b) more tend to be married (84.2% married as against 52.9%);
(c) interestingly, proportionately they are slightly less educated in terms of not having a degree (73.7% graduates vs 85.6% for managerial);
(d) there appear to be no sharp differences between the managerial and entrepreneurial in terms of the impact of parental influences on their choices of careers (positive parental influence for managerial 42.9% is almost similar to entrepreneurial at 42.1%);
(e) however expectations as distinct from influence of parents on career choices showed a marked difference: the managerial scoring 71.4% for positive parental expectations vs 57.9% in respect of the entrepreneurial;
(f) marginally higher proportion within the entrepreneurial are from families with a larger number of siblings (84.2% of the entrepreneurial from homes with >2 siblings vis-à-vis 75.7% for managerial);
(g) also entrepreneurial women tend, proportionately to be much more experienced in terms of the number of years of working experience (68.4% with > 10 years working experience in contrast to only 34.3% for managerial);
(h) surprisingly, the higher proportion of managerial women appeared to be putting more than the statutory 44 weeks per year (managerial 70% as against 57.9% for the entrepreneurial)
(i) even more surprisingly, a father’s job in terms of whether he had been self-employed or not mattered little—42.9% of the managerial women had fathers who were self-employed which is about the same as 42.1% for the entrepreneurial women.

As a summary to our discussion here we present visual charts (Fig. 3) on the differences and similarities within and across the two groups of female managers and entrepreneurs. A quick glance over these charts across age, marital status, graduate education, parental influences and expectations, number of siblings, years of working experiences and nature of father’s job suggest, additionally the following:

- Largely similar: Context of family: as in father’s job, number of siblings, parental influences except for parental expectations.
Table 1

<table>
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<tr>
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<th>Entrepreneurial</th>
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- Largely dissimilar:

**Personal situation:** age, marital status, working experience except for university education.

Such findings enable us to theorize on the plausible forces behind a woman’s decision to turn entrepreneurial. Before doing so, we explore the more interesting differences between the female entrepreneurial and the custodial, managerial women.

5.2. Interpersonal styles

Here the possible differences between the entrepreneurial and managerial across a range of interpersonal styles are investigated. One of the interesting issues is whether the entrepreneurial tend to ‘value more friends at work’. Thus ratings are obtained determining if one is more ‘social at work’ [I seek people to be socially at work]. Clearly the results (Table 2) suggest the entrepreneurial to be more highly oriented (3.722 vs 3.5652; variance 0.157).

This same theme is approached from another perspective of whether one prefers to ‘join informal activities’ [I am included in informal social activities]; the results are consistently for the entrepreneurial to be higher (3.8947 vs 3.7246; variance 0.1701). Then a further, direct measure that proved for a response to the extent one ‘looks to people’ [I look to people to be with’—entrepreneurial females still score higher than the managerial women (3.3684 vs 3.3043; variance 0.0641).

In an attempt to reinforce these findings of the entrepreneurial females being the more socially oriented, we put a series of ‘preference to work alone’ items for the respondents. For all these measures, the managerial females scored consistently higher: ‘do not join work group’ (2.7429 vs 2.4737; variance 0.2692); ‘do not include others in work activities’ (2.6000 vs 2.1579; variance 0.4421); ‘do not join others in doing things together’ (2.8000 vs 2.6316; variance 0.1684). In other words, entrepreneurial females tend to be those who are people-oriented rather just been merely social.

Then we look at influence, control strategy of the entrepreneurial females vs the female managers. Here the results are consistently that of the entrepreneurial being more control-minded than the managerial: ‘influence others in idea and action’ (3.9474 vs 3.3143; variance 0.6331); ‘take charge when around’ (3.6316 vs 3.3000; variance 0.3316); ‘dictate the way people do things’ (3.7895 vs 3.3286; variance 0.4609).

Given such findings, it will be interesting to ask if the entrepreneurial are as trusting of people as the managerial in being ready to ‘confide in people’—the results is hardly surprisingly, the entrepreneurial are lower, and thus less trusting of people (3.7895 vs 4.2143; variance 0.4248).

To complete the picture, the respondent is asked whether they ‘do not keep private, their feelings’. In this respect interestingly, the score for managerial is only very marginally higher than the entrepreneurial (2.8571 vs 2.8421, variance 0.015), suggesting little differences on this interpersonal attribute.
Fig. 3. Visual charts.
5.3. Personality traits

We now turn to key personal traits distinguishing the female entrepreneurial from the managerial. Across a wide range of the measured personal traits the female entrepreneurial are found to be more pronounced than the managerial.

Broadly speaking the entrepreneurial female tended to be more reflective in terms of these measures (Table 3): ‘analytical’ (4.3158 vs 4.1143; variance 0.2015); ‘evaluative’ (4.2105 vs 4.000; variance 0.2150) and ‘logical’ (4.3158 vs 4.1286; variance 0.1872). More interestingly and as to be expected the female entrepreneurial tended to be more an experimentalist: ‘doing’ (4.4211 vs 4.0429; variance 0.3782), ‘active’ (4.5000 vs 3.8286; variance 0.6714) and ‘experimentation’ (3.9474 vs 3.5429; variance 0.4045).

On abstract and future-oriented thinking, the female entrepreneurial too scored higher: ‘abstract’ (3.2105 vs 3.0571; variance 0.1534), ‘future-oriented’ (4.1111 vs 3.8429; variance 0.2681). The female entrepreneurial too are more ‘pragmatic’ (4.1053 vs 3.8714; variance 0.2339).

Then as both samples are females, it will be intriguing to inquire onto the ‘feeling’ dimension. Here we get probably the most exciting results: ‘responsive’ (4.4211 vs 3.9429; variance 0.4782), ‘intuitive’ (4.0526 vs 3.9286; variance 0.1240) and on intensity of feelings, ‘intense’ (3.9444 vs 3.3286; variance 0.6158). In other words, the female technopreneur is one driven heavily by her emotional energy, maybe passion or allows herself to be under or be inspired by strong emotional influences. This is consistent with the widely popular notion of emotional intelligence (EQ) (Goleman, 1995) as necessary for success (Fig. 4).

Even more intriguingly is the findings that despite being so strongly emotional, the female technopreneur is on the whole very much less of a risk taker than we had expected. Perhaps a female entrepreneur is more risk averse than in comparison with male entrepreneurs. We get the rather disappointing findings that the entrepreneurial are only
slightly more of a ‘risk-taker’ (3.8947 vs 3.7429; variance 0.1518). Our anticipation was for a much higher variance to result from the analysis. This finding is reinforced by the results from analysis of the style of leadership.

### 5.4. Leadership styles

We next investigate separately the leadership qualities of the female entrepreneurial vs the managerial women on two dimensions: being relationship based or leadership oriented.

As for those measures (Table 4) reflecting the relationship dimensions, the entrepreneurial female are more ready to ‘allow high degree of initiative’ (4.4211 vs 4.3000; variance 0.1211), more ‘willing to make changes’ (4.4211 vs 4.1714; variance 0.2497) and more likely to ‘entrust group to make judgement’ (4.2105 vs 3.9714; variance 0.2391). This interestingly suggests the female entrepreneur to be more highly adaptive in orientation than the managerial woman. This may also be a consequence of the necessity for small enterprises to adapt so as to survive in changing market conditions. This aspect of the female technopreneurress trusting the judgment of a group should be juxtaposed along with the other, contrasting measure of her leadership attribute—acting independently.

The entrepreneurial female exhibits far more independent leadership tendencies. This is implied in her willingness to ‘act as spoke-person for group’ (3.7368 vs 3.2857; variance 0.8190), or to take charge by speaking ‘for group in front of visitors’ (4.000 vs 3.4429; variance 0.7545) and more likely to ‘act without consulting’ (2.6316 vs 2.1429; variance 0.8561). Most telling of all is in her tendency to ‘act without consulting’ (2.6316 vs 2.1429; variance 0.8561) and thus she is simultaneously ready to be acting all on her own.

We then utilize broadly the empirical results to model, as holistically as possible, the mind of the technopreneurress (Fig. 5).

### 5.5. Mind of the technopreneurress

What is most interesting is to relate these detailed, item-by-item statistical findings to the broader, popular and widely known generalizations of brain behavior. In particular, we are interested in the dichotomy of the left-sided or right-sided brained functions as discovered by Nobel Prize winner Roger Sperry (split brain research; left, *words* and right, *pictures*) who later and wisely proposed a merging of mind, brain and human values (Sperry, 1983) (Fig. 3). Our discussion here is inspired by his call.

The dichotomies—left and right—are themselves intriguing though now regarded as being too simplistic. For all practical and useful purposes, our brains work for us as a merged entity rather than when split. Still, for convenience of the reader, these qualities are recounted below:

1. left-sided, more objective than right-sided subjectivity
2. logical (left) vs randomness (right)
3. sequential vs the holistic

![Fig. 4. Right vs left.](image-url)
(4) rational vs the intuitive

(5) more analytical vs the synthesizer.

Using this classification, strategy processes within corporations (Foo and Grinyer, 1994) then tend to be largely left-brained even though there is evidence of the presence of corporate randomness in terms of staging meetings when demanded by changing, evolving situations. Since the male gender dominates in corporate strategy processes, such findings are not at all surprising. This also implies that corporate strategic planning is functioning as a split-brain rather than as a merged entity! Thus we may also argue corporate strategy process (at least of large, publicly listed corporations) to be dominantly ‘male’ (e.g. less emotional, more logical) and lacking in ‘female’ qualities (e.g. more intuitive, feelings but less dominated by rationality).

By an interesting contrast, our findings of the mind of the technopreneur-entrepreneur women CEOs—are all the more intriguing as there are major, striking polarities.

Firstly, inter-relationally, the technopreneur less people-oriented is also highly control-minded and less than fully trusting than she may appear. Secondly, whilst the technopreneur is a doer she is at the same highly reflective in her thinking—and perhaps the most distinguishing entrepreneurial feature, intensely, emotionally oriented.

Thirdly, although geared towards the group taking initiative she remains always capable of acting all on her own! These research findings of female technopreneur less enable us to ground empirically, the attributes of the 21st Century Entrepreneur, male or female.

5.6. Speculating on the future entrepreneur

Given the current rate of technological progress, we may anticipate in the future the highly successful entrepreneurs—male or female—to have two pre-dominant qualities as follows:

First and foremost, it is the now again, highly popular notion of emotional intelligence, EQ in contrast to intelligence quotient, IQ. This is especially reinforced by our empirical research results, that the highly successful technopreneur is governed intensely by feelings. Most importantly that being strongly feeling-oriented adds to the strength of becoming a successful entrepreneur (Fig. 6).

Second with the advent of the internet and immense escalation in computing power, the logical, computational aspects of being successful are already, independently, well taken care of. But as it stands, the computer cannot ‘feel’ as we as human beings are able. Speculatively, in the not too distant future we may even reach the point where the technology may enable ultra slim ‘chips’ to be embedded into the gray matter of our brain (Trevathan, 1990). For example, scientists at the California Institute of Technology are working towards building an artificial brain out of biological, living neurons.
One main reason why women are held behind males in society is that they had to tend to the family especially in giving birth to children. With a female has say two to three children, this will effectively set her back, career-wise by at least 2–3 years or substantially more. For women often tend to the ones to nurse, breast-feed and care for the babies. A search on the inter-net using ‘artificial womb’ will inform the reader on the very probable, availability of the device in the future. If so, we can expect a mini-social revolution—where females can tend compete with males on a more equal footing with perhaps an even better chance of succeeding. For females are more strongly intuitive, feeling-oriented than males.

Perhaps one of the best possible indications of the rise of the ‘weaker’ sex in entrepreneurial or business leadership roles may be seen in the very recent trends. A recent article in the Singapore’s Sunday Times (August 24th, 2003) citing a United Nations Development Fund for Women survey put it bluntly:

*Chinese women outshine the men in business:*

- They are better at communications
- They think more rationally
- They pursue careers with resolve

Then from anecdotal evidence, we have a technopreneurial matriarchy. After all the greatest of all Chinese Emperors on the art of strategy had to be Wu Zetian—*…* Wu Zetian—*…* a woman (Foo, 2003), wrongly attributed as ‘Empress’ by Western historians.

**6. Uncited references**


**References**


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