Abstract
The question I would like to address for the conference theme of women and social transformation, a new era for a just and gender-fair society, is how networks and their potential for empowerment may contribute to this aim, especially in regions of tropical Asia.

Influenced by theories in network science and philosophy this interdisciplinary keynote paper emphasises the power of networks across multiple plateaux, starting with the networks evoked through images in an artwork, flinging across to women’s networks, and thinking through education networks.

Keywords: women, power, networks, rhizomes, education, tropical Asia

‘The education and empowerment of women throughout the world cannot fail to result in a more caring, tolerant, just and peaceful life for all.’

Opening - Women’s Space

‘The education and empowerment of women throughout the world cannot fail to result in a more caring, tolerant, just and peaceful life for all.’ (Aung San Suu Kyi, 31 August, 1995).

I’m sitting in my university office in Singapore looking at the artwork that hangs above my desk. The piece is in the style of Asian pop art: bright photo-montage images and graphics. In the left corner is the image of an elderly Malay woman wearing traditional tudung (headscarf), kebaya (blouse) and sarong, feet in plastic sandals, body hunched over her wooden stall selling kue (cakes). The old woman is positioned as if about to fall off the side of the artwork. Behind her, to the right, is a colour-saturated image of a street cart, ESCENDOL printed across its front in Bahasa Indonesia, jars and canisters arranged inside; the famous shaved-ice desert of South East Asia with its variations of pandan-infused green worm-like rice jelly, coconut milk and palm sugar. Such carts are fading from the bustling streets of Asian cities. At the centre-right of the artwork is a portrait-style image of a young woman, sari draped across one shoulder in South Indian style. She faces forward looking obliquely past the viewer, her lips slightly parted – about to speak or perhaps to smile; her whole life ahead. Mandala circles appear around the young woman’s head, a motif of the 1960s hippie movement, recently recurring in Boho-Chic fashion; the West’s appropriation of symbols from India. Dispersed through the artwork are prints of Peranakan tiles, the ones found on Straits Chinese heritage houses of Penang, Melaka and Singapore – the old Malay ports which drew colonial cross-cultural maritime networks of trade and labour. Stylised Chinese characters run down from the upper right corner of the artwork. Interspersed throughout are images of flowers: lotus, hibiscus, peony. This is a feminine work of art - women’s space.

Ketna Patel, “Chalo Asia Boleh Boleh” Print 9/100, 2015
Across the top of the artwork are the print words *Chalo Asia! Boleh Boleh!!* in a combination of Hindi and Malay. Given the long history of South Indian, Chinese and Indonesian migration and trade through Singapore, the words could have been in Tamil, various dialects of Chinese, or in Indonesian. In English the words shout out: *Go Asia! Can Can!!*

The networks evoked through the images of this artwork – those of street food vendors, colonial trade and labour networks, the appropriation of images from the East into Western counter-culture and contemporary fashion trends, the multi-culturalism symbolised in tiles, clothes, languages and flowers – demonstrate that networks are ancient as well as contemporary, they exist in the everyday workings of life and can be analysed across multiple plateaux. They are pervasive, subtle and powerful.

**A Network Narrative**

The story of how this artwork came to be on the wall of my university office requires a networked narrative.

I’m flying out of north Borneo having just climbed Mount Kinabalu and traversed the *via ferrata* – hanging by wires off the mountain precipice in an attempt to overcome a fear of heights. The Air Asia inflight magazine has an article about *Women on a Mission*, a philanthropic network of women located in Singapore who challenge themselves to extreme endurance treks in order to remember the fears and challenges that face all women, to raise awareness of issues of gender inequality and violence, and raise money through innovative marketing campaigns and events. The money is donated to other international – locally led – philanthropic networks concentrating on women’s causes. I read that recently a team from *Women on a Mission* had climbed the Himalayas. (Santhinathan, 2015)

As the plane taxis into Singapore Airport, that hub for flights from around the globe, I walk through the vast connection of terminals with their network travelators and escalators, my phone automatically connected to WiFi. One hand is Google-searching the website of *Women on a Mission*. Emblazoned across the site’s homepage are the words ‘CHALLENGING OURSELVES TO EMPOWER WOMEN’. The philanthropy network includes Singaporean and overseas women, many of cross-cultural descent – French, Swiss, Filipina, British of Indian descent or of Dutch descent, Russian, South African, Chinese from Brunei. They have worked internationally in roles across marketing, banking, childhood education, luxury brands, social entrepreneurship, radio and news presenting, art, jewellery and fashion design, photography,
writing, social activism, racehorse training, as well as corporate philanthropy. Professional titles include: Global Director, Executive Director, CEO and Founder. Their education spans many disciplines from arts to business. Awards are numerous. (www.womenmission.com)

The webpage announces an upcoming art event. I RSVP online while swiping my Australian passport through the airport surveillance system and placing my thumb on the biometrics scanner. Another escalator goes down in the underground rapid transit network. The driverless train approaches, doors slide open, the automated announcement tells me – in Tamil, Malay, Mandarin and English – to mind the platform gap. I step inside sending off an email to one of the organisers whose photo appeared in the inflight magazine among the group of women in the Himalayas. The email expresses an interest in knowing more about their philanthropic network.

A couple of weeks later I’m standing in the lounge room of a large private colonial house that has been turned into an art gallery for the evening’s charity event. In front of me, eyes staring obliquely out from one of the artworks is the face of that young Indian woman. The artist is standing beside me. We are discussing the piece, an interchange of ideas, people are milling all around. I learn later that the British-Indian Ketna Patel grew up in Africa, lived in Singapore for many years where she met her English artist husband, and that they currently reside in Wales and India – both are back in Singapore for this charity event. Men are never far from this networked women’s space. Later in the night there is the auction, conducted by of the husbands of Women of a Mission, of a specially commissioned art piece. Sponsorship has been gained – through the women’s networks – from a local high profile restaurant, a wine merchant and a hospital. Women and men of various cultures and nationalities mingle, children run around playing in intercultural groups. During the main speech it is announced that a new organic perfume, in commemoration of the women’s Himalaya trek, has been released, and that proceeds of the evening’s event will go to AWARE (Association for Women for Action and Research), a Singapore gender equality advocacy and support network. After the speeches I speak to the Association’s representative – networking to invite AWARE to the university as guests in my first year Anthropology subject which brings together students from around Asia and the world. As the evening begins to wind down I return to look at the artwork, already picturing it hanging in my office – a reminder of the importance of women’s space and networks.
Although the women’s space of the above narrative at first appears highly empowered and empowering, if we pause to pull at the threads of these networks, what is striking are the multiple layers – technologies, cyberspace, national borders, communities; and their tenuous ties. These are not strong community networks, what makes this networked narrative interesting are weak links – how different clusters of women’s networks are brought into contact through lines that draw together adventure, entrepreneurship, philanthropy, an international artist, an advocacy and outreach group, and an academic.

**Networks & Rhizomes**

As the world entered the new millennium we encountered not only ‘the Asian Century’ (Robertson & Lundberg, 2013), but also the full-blown age of networks and exponential ecological fragility. Contemporary theorists of network science don’t just write about networks, they engage with digital technologies; thus, virtual spaces have influenced theoretical work in network science. Similarly, as we encounter an increased awareness of the intricate webs of ecological systems some philosophers are turning to images-of-thought inspired by nature; one such image is the humble rhizome (Lundberg, 2013a). In turn, these theories affect the way we understand the dynamics of power.

**Network science theory**

Emerging out the space of physics and mathematics, new network science demonstrates the properties and processes of networks on and across multiple plateaux (Barabási, 2003; Buchanan, 2002; Watts, 2003; Lundberg, 2013a, 2013b). These include: brain functions, diasporas of people, food networks, post-Fordist manufacture, transport networks, telecommunications, social networks (physical and online), viral networks (virtual and medical), financial networks, ecological networks, and networks of cities such as street lighting, sewerage and water distribution. Network science can also shed light on women’s networks.

Recently, network science has been taken up in the humanities and social sciences. At James Cook University, an Australian university with two campuses in the tropical north of Australia and one campus in Singapore, network theories form the basis of a first year Bachelor of Arts subject called *Our Space: Networks, Narratives and the Making of Place* (Lundberg & Kuttainen, 2011-2015), which appropriately, at the university’s offshore campus in Singapore, is tutored in new ‘networked’ classrooms (Lundberg, 2013a).
In turn, the network theories taught in this subject have lead to interdisciplinary research projects and diverse case studies. These include, for instance: mapping the international flow of magazines across the Pacific during the 1920-1930s golden age of passenger liners (Kuttainen et al., 2010-2011); using network imaginary for an international think tank on global education hubs (Lundberg, 2013c); interpreting experiences of students on exchange through a discourse analysis of their blog posts (Lundberg et al., 2012); demonstrating the connections of the TransOceanik research network, a Laboratoire International Associé (LIA) of CNRS (Lundberg, 2013b); analysing the design space and connectivity of a networked classroom (Lundberg, 2013a), and a cartographic analysis of a university assignment involving networked communication (Lundberg & Toh-Heng, 2015).

Crossing between disciplines is not unusual in new network analysis. Indeed, the scientists’ inspiration for their theory came from a social psychology experiment devised back in the counter-cultural days of the 1960s, and connected to a trivia game developed by bored university students. To understand how people are linked in webs of connections, the psychologist Stanley Milgram used the snail mail postal network to demonstrate that people could get a letter from one place and person to an unknown recipient in another location, in approximately six relay postings. This became known as six degrees of separation. This same notion of six degrees also appeared as the basis to a trivia game which entailed finding the links (six or less) between the Hollywood actor Kevin Bacon (a prolific actor but not a megastar) and any other actor. At the turn of this century the network science theorists were profoundly shocked by the idea that over six billion people could be linked through just six connections. The scientists’ aim was to model this phenomenon through a mathematical graph (Buchanen, 2002, pp. 14-15; Hilton & Talas, 2009). The graph shows that the notion of six degrees of separation is real, and is a ‘small-world’ network.

What this reveals is that links between people are not spread out evenly; social life clusters. The networks of transportation, internet, economics, biology and ecology likewise present small-world phenomena. In each network, most nodes are linked to only a few other nodes. But some nodes have lots of links. These hubs shorten the paths between all the nodes in the entire network. The key principle of six degrees is that it is not about strong connections; weak ties have the ability to further links and networks.

An important principle of network science theory is the ability to connect between network clusters. In other words, is it not about who you know in your local community, your strong
connections (virtual or real); what becomes significant – and demonstrated through graph mathematics – are the weak connections. The weak ties, like a vector, create a line of flight that jumps from your cluster over to another cluster thereby connecting you with a whole new group of people. Furthermore, this pattern is evident across multiple plateaux: the technology of postal networks, which rely on transport networks; the people networks of Hollywood, or Bollywood, actors and movies; or ecological networks.

**Rhizomes**

Network science resonates with the ecology-philosophy of rhizomatics. Developed by the philosopher Gilles Deleuze and psychoanalyst Félix Guattari, this thought experiment is based on the image of the botanical rhizome (1987 [1980]). Inspired by the tropical locations of Alagappa University in Tamil Nadu and my own university campus in Singapore, this theory evokes images of the roots – and spice trade routes – of ginger, turmeric or galangal.

The underground root of the tumeric is transversal with nodes connecting lines in all directions. Rhizomatic theory and research allows for multiple, non-hierarchical entry and exit points in the analysis and presentation of research. It necessitates connection and diversity of content, where any node of the rhizome can connect to any other (Deleuze and Guattari, 1987, p. 8). It also suggests that anything can come under analysis, including women’s spaces of all forms and textures: a feminine pop art work, philanthropic networks, university women’s departments and their interdisciplinary teaching and research networks, aid networks, local women’s action networks, literacy networks, networks of micro-financing, water collection networks.

A feature of rhizomes is their ability to rupture. If we break off a node of tumeric and replant it elsewhere, it will grow into a new network. Significantly there is no origin or hierarchy to the rhizome: every node holds the potential to expand the network, or start a new network. The horizontally networked image of rhizomes can be juxtaposed to the hierarchical image of the tree with its deep penetrating tap root, upright linear trunk, and bifurcating branches – the tree image on which traditional western philosophy bases notions of evolution, racism, development, progress, patriarchy and knowledge. While a tree model works according to notions of linear hierarchical development, rhizomes indicate spatial horizons of connections and ruptures. Knowledge in a rhizome scenario is like the network science image of the world wide web where links cluster, break, and fling across to a new cluster.
However, the philosophy of rhizomatics is never simply anti-tree; in fact, the banyan tree of tropical Asia is a spectacular example of rhizomatic imagery. Sprouting as an epiphyte via bird faeces in a host tree, it sends out adventitious aerial roots that grow downwards to the earth to root and form new branches that become trunks. The original tree dies, but the banyan continues to spread (Geerlings & Lundberg, forthcoming; Lundberg, 2008, pp.9-10, 2013a). The banyan tree, as the national tree of India, with one of the largest and most ancient specimens in the world located in Tamil Nadu, may be an exemplar image of the concept of rhizomatics – an organic imaginary of networks.

All network spaces have the potential to be rhizomatic and empowering. Yet, these spaces also hold hierarchical aspects, including acting as vehicles of surveillance and disempowerment. There is no general theory that can provide one solution to the problem of women’s space and gender equality. The importance of rich and varied local case studies can not be overlooked – the importance of women’s stories arising from the details of everyday life are of growing importance in this new century of big data.

**Go Asia! Can Can!!**

The Asia Century is often portrayed in financial terms as rising incomes, rising consumerism and rising cities. In this fiscal imaginary, the problem of inequality is narrowed to monetary terms. However the concept of women’s space, as the potential for gender equality, necessitates the improvement of wellbeing across society to offer greater opportunities in the broader indicators of wellbeing: education, income, health, choice of employment and involvement in decision-making (State of the Tropics, 2014, pp.171-172).

These indicators form an ecology; nodes in an interconnected matrix, like a rhizome or a banyan tree. Each indicator as a node of investigation can also be studied as a cluster in a larger network – and networks involve inherent relations of power.

**Education and gender empowerment**

Education is a key node in human development and in creating spaces of gender equality. ‘Education represents opportunity. At all ages, it empowers people with the knowledge, skills and confidence they need to shape the future.’ (UNESCO, 2011)

The participation of girls and young women in education generates significant and sustainable social benefits. Education opens up women’s space, enabling women to take up
transformative positions in society. The higher the level of education attained the broader the opportunities. Each level of education is associated with increased decision making, freedom and mobility for women (Malhotra et al., 2003; State of the Tropics, 2014, pp. 378-379).

Female empowerment is an important factor influencing gender equality in a society. Girls’ and women’s access to education is a necessary aspect of empowerment to all females. Empowerment leads to increased economic opportunities for women, as well as access to transformative and decision making roles. The measurement of progress includes higher ratios of women in all levels of education, increasing businesses opportunities for women, creating greater freedom and mobility, and encouraging and enabling women in decision-making and political roles. Gender equality requires further initiatives in female empowerment to increase the number of women in secondary and tertiary education and in formal employment, including at high levels. (State of the Tropics, 2014, pp. 380-381; UNWOMEN)

Improved access and engagement with education at all levels has assisted more women to enter the formal labour market and into business ownership. Business ownership for women in developing nations has also been established through micro-finance or micro-entrepreneur funding, providing women with opportunities to apply the skills they learn. These businesses can generate income for their female owners and possible employment opportunities for other members of the community. Women are considered more likely than men to reinvest money earned from micro-entrepreneur initiatives and employment back into their children’s wellbeing, including in education and health (State of the Tropics, 2014, pp.380-381)

A study by Tata and Prasad (2008) used network science theory to analyse the relation between microfinance and women’s networks. The research notes women’s strong ties to the close cluster of local community and articulates the importance of weak ties – those ones that can fling across to other clusters in order to create larger networks for entrepreneurial engagement. More research needs to be done in this area through grounded, local case studies.

Despite worldwide attention and increased funding for female education, barriers still exist to prevent girls from starting and completing secondary school, and for many university is not even a distant dream. The main barriers to girls attending secondary school are poverty, followed by the undervaluing of girls (Fancy et al., 2012). Interlaced with these barriers is girls’ burden of chores. Children from poorer households are less likely to attend school, with girls more likely than boys not to be educated due to poverty. Poverty, in turn, is related to
access to drinking water – which also has a gender dimension. In households without on-premise access to drinking water, it is women and girls who often have the primary responsibility for collecting water. The long term consequences of this burden of chores are significant: inhibiting involvement in education, affecting opportunities to engage in productive work and income generation, and impacting on women’s involvement in broader social and political activities. (State of the Tropics, 2014, p.404)

Opportunities provided by higher levels of education can support women and girls to engage equally with men in society. However, in order to achieve women’s space, we need to engage with men and men with us. Men are encouraged to use their influence at all levels of society to help deconstruct gender stereotypes and their concomitant discriminatory practices. There remains a much higher ratio of men in decision-making occupations, and men have an important role in participating in processes towards balancing gender equality. This balancing is required at all levels and across all domains. It requires working collaboratively to challenge cultural traditions and perceptions, as well as legislation and social policy that influence the discrimination of women in education and decision-making practices. (Malhotra et al. 2003; State of the Tropics, 2014, pp. 382-383)

**Alumni networks**

Education entails literacy, the acquisition of skills, the analysis of information, and a widening ability to think through diverse problems and communicate ideas. As students progress through assignments they are not just proving that they have gained knowledge; importantly, they also gain of sense of empowerment – for each assignment entails facing fears and challenges, and demonstrating endurance. However, there is something more. Access to increasing higher levels of education also offers openings to more far flung networks. Primary schools provide access to a cluster of other students located in a local community, secondary education draws together students from greater distances, and university education may entail moving away from home and engagement in state, national or international networks. Each level of educations enables students to connect wider.

The phrases ‘school tie networks’ and ‘old boy networks’ suddenly take on a greater meaning. These phrases once referred to male only members of elite British schools and universities and their network of social and business connections. The term literally and figuratively invoked the tie of the school’s uniform. Today this elitism is less evident, and we use the term alumni (the singular alumnus refers to men; alumna is the feminine term that is rarely seen or
Increasingly high schools and universities promote online networks with their alumni, while cross-alumni organisations offer networking opportunities for clusters of university graduates who studied in a particular country or internationally. From the old strong tie elite networks associated with hierarchies, twenty-first century alumni networks can create weak ties that span across institutions and borders thus offering far flung international networks. These alumni networks of young, educated, global citizens are also spaces of empowerment; and they are potential nodes towards gender equality. We have an obligation to include gender awareness in universities, across all departments, so that our alumni graduate with an understanding of gender equality. Alagappa University recognises this obligation through its commitment to Women’s Studies. The Centre for Women’s Studies and Department of Women’s Studies are networking clusters, they network across the university, out to community programmes, and internationally through connections to other universities.

**Closing – Women’s Space**

Because there is no one way of empowering women, because case studies of woman’s struggle for empowerment in order to bring about equality are going to vary according to the specifics of place – those local nodes in international history, culture, society, politics and economy, we need a way of imagining women’s spaces as clusters, arising from women’s networked narratives, in all their multitudes of visual, voiced and written texts.

The prefatory quote at the beginning of this paper is from Aung San Suu Kyi’s video recorded keynote address for the 1995 NGO Forum on Women which was held in conjunction with the UN Fourth World Conference on Women in Beijing, China, 1995. Over 31,000 women from 200 countries attended the events which signalled a worldwide network of women working towards gender equality, development and peace. The recipient of many humanitarian awards, including the Nobel Peace Prize 1991 and the Jawaharlal Nehru Award for International Understanding 1993, Aung San Suu Kyi, wearing signature flowers in her hair, remains a role model of women’s empowerment.

I would like to close this paper with another quote, this time from the 25th African Union Summit, July 2015. The theme of this year's summit was the ‘Year of Women’s Empowerment and Development’. The quote is from a panel speech by the Special Envoy of the UN High Commissioner for Refugees.
‘We need policies for long-term security that are designed by women, focused on women, executed by women – not at the expense of men, or instead of men, but alongside and with men.’

‘There is no greater pillar of stability than a strong, free and educated woman, and there is no more inspiring role model than a man who respects and cherishes women and champions their leadership.’ (Angelina Jolie Pitt, 11 June via Facebook 14 July, 2015).

The Special Envoy of the UN High Commissioner for Refugees and award winning actress and filmmaker with the charismatic smile is also the recipient of a Freedom Award 2007, and a Jean Hersholt Humanitarian Award 2013. She uses her Hollywood power to draw attention to, and speak out on, women’s rights as they intertwine with development and refugee issues across the globe.

Between the opening quote to this paper audio recorded in 1995 and the closing quote blasted across social media in 2015, is a span of twenty years. During this time the world has witnessed a whole generation grow into young adults. I look up from my computer screen to the art hanging on the wall in my university office. The image of that young woman continues to stare obliquely out of the artwork. Flowers are scattered here and there, her lips slightly parted: the glimmer of a poignant smile, or about to speak out. She could be twenty years old, about the same age as my undergraduate students. In the span of her twenty years we are yet to create a women’s space: empowering networks for all genders. Her eyes gaze out towards the future.
Dedication

Dr Victoria Kuttainen, the Co-Coordinator of the subject Our Space: Networks, Narratives and Making of Space, thank you for intellectual generosity. For my wonderful students of all genders from across the world – you are the future.

Reference list


Women on a Mission (n.d.). [www.womenmission.com](http://www.womenmission.com)