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Material Witchery: Tactility Factory as a site of emerging ethical practice

Morrow, R. (2017). Material Witchery: Tactility Factory as a site of emerging ethical practice. In M. Schalk, T. Kristiansson, & R. Maze (Eds.), *Feminist Futures of Spatial Practice: Materialisms, Activisms, Dialogues, Pedagogies, Projections* (pp. 75-93). [4] (Art Architecture Design Research). Spurbuchverlag: Art Architecture Design Research.

Published in:
Feminist Futures of Spatial Practice: Materialisms, Activisms, Dialogues, Pedagogies, Projections

Document Version:
Peer reviewed version

Queen's University Belfast - Research Portal:
Link to publication record in Queen's University Belfast Research Portal

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Download date:22. Oct. 2020

Section: Playing with Materialism

Material Witchery: Tactility Factory as a site of emerging ethical practice.

The warp and weft

Autumn Stanley dedicated her career to writing and researching women and technology, resulting in multiple papers and the seminal publication, 'Mothers and Daughters of Invention: Notes for a Revised History of Technology' (Stanley, 1995). In a later essay, 'Women hold up two thirds of the sky', she argues that technologies only become lauded and understood as significant once they are appropriated by men. She cites the example of herbal remedies developed by women becoming understood as medicine and drugs, only when 'invented' by men (Stanley, 1998). For Stanley, Catholic institutions and their male doctors discredited healers and wise women, branding them as witches as a means to 'wrestle control of medicine from their herbally-trained females counterparts'. In recognition of Autumn Stanley's wise women, this essay claims the term '**witchery**' as a mark of expertise and persistence in areas, and in a manner, outside the normative and frequently gendered conventions of material practice and technology.

This essay examines a collaborative material practice between two women that is imbued with such witchery. The collaboration is between Trish Belford, a renowned textile designer and researcher, and myself, Ruth Morrow, architect and academic. Our working relationship stems from a mutual interest and respect for each other's discipline, but we quickly decided on the utopian challenge of *making hard things soft* as a means to bring purpose and focus to our collaborative practice. The ambition of the project also draws on a long-term engagement with inclusive design and feminist critiques of the built environment that I as an architect have previously been involved in[1]. Two observations that evolved out of inclusive design thinking were: **the paucity of sensory stimulation in the built environment,** and that: **the majority of materials, products and systems that make up the built environment are designed to meet a technical specification and not a human specification.** These observations combined with an understanding that feminist practice demands a conceptual shift meant that the work of Tactility Factory has sought to strategically contribute to the built environment not in form, but rather in detail and concept. This is a deliberate push to link conceptual and utopian thinking with the *experienced* narratives of every-day spatial encounters, through a practice-based and situated methodology.

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[1] Some previous writing that reflects this are:
Morrow, R. 'Why the shoe doesn't fit – architectural assumptions and environmental discrimination.' In David Nicol and Simon Pilling (eds).*Changing Architectural Education: towards a new professionalism*. Edited by E & FN Spon. 2000 pp. 43-48
Morrow, R and Moore, K. *An Inclusive Design Dialogue on Ethics and Aesthetics* OpenSpace PeopleSpace, An International Conference on Inclusive environments, Edinburgh, Scotland. Published in Proceedings on Website, 2004. To be republished in forthcoming Routledge Reader on Disability and Architecture, Edited by Jos Boys.
Morrow, R. 'Building clouds, drifting walls' in Petrescu, Doina, ed. *Altering practices: Feminist politics and poetics of space*. Routledge, 2007.
Morrow, Ruth, and Belford, Patricia. "Fabrication and Ms Conduct: Scrutinising Practice Through Feminist Theory." *Architectural Theory Review* 17.2-3 (2012): 399-415.

The now ten-year long, part-time collaboration began initially as a project, called Girli Concrete (2005), based in Interface, a research institute in the University of Ulster. By late 2009 we had formed a company, Tactility Factory, to commercialize the material products of the collaboration[2]. By that stage we had several patentable technologies that underpinned a range of new materials, where textiles and concrete permanently co-formed the upper surfaces of concrete elements. The company commercializes this technology as interior wall panels.

The technical challenges behind bringing two very distinct, and at times almost antithetical, material groups (concrete and textiles) together have required equal amounts of technical rigor and witchery. Tactility Factory has been the site of a collision of cultures and potent dichotomies: textiles and concrete, academia and commerce, economics and ethics, real-life and utopian. Our material practice is a bubbling, dynamic cauldron of tensions and challenges. It calls for an ethics to emerge that shifts focus away from holding onto pre-formed ethical principles to the development of an ethical practice. As Stacy Alaimo and Susan Hekman (2008, 8) point out, 'Ethical Practices-as opposed to ethical principles- do not seek to extend themselves over and above material realities, but instead emerge from them, taking into account multiple material consequences.'[3] We now understand Tactility Factory as the site of an emerging and dynamic **ethical material practice** that constantly negotiates the landscape it traverses.

In managing these tensions, we have turned repeatedly to the source of the initial impetus i.e. inclusive feminist theory. Engaging with such work has helped to contextualize the issues: find a balance between discourse and matter; and strategise viable responses. And in those moments when problems have seemed insurmountable, feminist readings have been a source of comfort, courage and community.

The essay will outline the nature of Tactility Factory and what has lead to this practice. It will demonstrate how active engagement with range of feminist theory and writing has led to a permanent intertwining of theory and matter. It will then explore in more detail four conceptual areas around **time**, **language**, **technology and networks** that have been significant over the last ten years, again contextualizing them through feminist thinking and theory. The essay also includes a graphic timeline of key actions, moments, images, language and characters, and will conclude with a summary of the things we strive after in order to build and sustain an ethical material practice. In this way we hope to inform future feminist material practices.

Spinning the yarn: The background to Tactility Factory

The seeds of Tactility Factory were sewn in 2005 when Trish and I met and decided to work together. We had no project in mind initially but Trish started to make strange concoctions and brews of interwoven materials and I joined in. Within a few days we had settled on the idea of *making hard things soft* and had an array of imaginary substances and garments in our minds: woven metal, knitted glass, appliquéd stone, column socks. But we started with trying to 'soften' concrete and that is where we have stayed. At the time we naively thought we could resolve the technology of one material combination within a year and move on to others, not realising the extent of the technical and creative challenges that we would have

[2] Tactility Factory survived initially on small commercial grants, awards and commissions until Jan2013 when we gained significant investment funding and were able to employ staff and move premises.

[3] Alaimo, Stacy and Hekman, Susan. Introduction: Emerging Models of Materiality in Feminist Theory. In Alaimo, Stacy and Hekman, Susan (eds) Material Feminisms. rite. 2008, p8

to overcome. Gradually we resolved to bring the techniques, technologies and thinking of textiles to concrete production.

Concrete is an interesting and somewhat mystical material in itself, changing state from fluid and manipulable to solid and structural in an exothermic process. It is also a ubiquitous and low-tech material that impacts on the lives of everyone, everywhere. It is reputed to be the second most consumed material after water and underpins one of the world's largest industries – with the global ready-mix concrete market predicted to reach over $100Billion by 2015.[4] Within the built environment professions, concrete is regarded as technically adaptable, structurally robust and globally accessible. In Architecture, it has achieved a cult status afforded to only a few materials. Viewed almost as the archetypal architectural material, it links the progressive history of modernism to the uber-cool present: concrete is perceived to be 'the ultimate modern material' (Forty 2012). But beyond the built environment professions, concrete is widely perceived as a harsh material with little emotional value: as Adrian Forty writes, 'An element of revulsion seems to be a permanent structural feature of the material.'

Concrete also has poor environmental credentials. Despite extensive efforts by industry and academia working together to develop recycled aggregates; more efficient processes and mixes; non-cementitious concrete; and ways to better exploit concrete's thermal mass properties, the vast majority of concrete production and consumption remains highly unsustainable. Likewise the textile industry is also known for depleting resources, high water and energy consumption, and polluting processes.[5] Both concrete and textiles are equally pervasive and environmentally challenging materials. It would be easy to desist from using both materials based on their environmental credentials alone but due to their ubiquitous nature, we chose instead to try to reconceptualise them and address their unfriendliness head on.

Initially, because of lack of resources and experience, we chose to work with existing generic concrete and textile technologies. More recently, with better resources and increased understanding, we have begun to go back to source and unpick those 'givens', experimenting with non-cementitious concrete mixes; locally grown and produced yarns; and working with a few remaining local textile manufacturers. In this way we hope to build a more sustainable process and product from the ground up. This twisting and weaving of our ethical path, at times through the thorny issues of sustainability, is perhaps the clearest indication of us *trying* to build an ethical practice, rather than adhering to ethical principles that often recoil from 'dirty' engagement.

Physically, we manipulate the constituent parts of concrete to suit each construction of textile used, but the real technical *witchery* lies in the textiles. We initially tested and selected a range of yarns to identify those that survive the alkaline environment of concrete. With this knowledge we were able to carefully source base textiles whose yarn, construction and finishing were suitable. We then deconstructed and reconstructed the textiles in such ways that they could integrate with the concrete to co-form the surface. Where textiles

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[4] 'The Cement Sustainability Initiative: Recycling Concrete'. World Business Council for Sustainable Development. July 2009 http://www.wbcsdcement.org/pdf/CSI-RecyclingConcrete-FullReport.pdf and Global Industry Analysts, Inc. PR Web. March 29, 2010. [accessed 1st Sept, 2015] http://www.prweb.com/releases/ready_mix_concrete/cement/prweb3747364.htm [accessed 12th May, 2014)

[5] Retail Forum for Sustainability. 'Sustainability of Textiles, Issue Paper no 11, (August 2013) accessed 1st Sept 2015 through http://ec.europa.eu/environment/industry/retail/pdf/issue_paper_textiles.pdf

were multi-layered we had to ensure that the method of bonding could also survive in a concrete environment. These technical processes were advanced over many years, hand-in-hand with the design of the surfaces. The resultant technologies that we developed to create our 'infused' or co-formed textile and concrete surfaces have subsequently gained several patents.[6] Autumn Stanley reminds us that: 'Almost 95% of all US patents are still granted to men; and in Britain and other developed nations, …. the situation is markedly worse.', so achieving those patents, whilst not our initial aim, was something we shared with pride. (Stanley 1995)

The resulting surface technology or 'faces' are cast with a further back layer of concrete to create solid and stable panels. The panels are typically 10-15mm thick in total, 1.2m wide and 2.2m - 3.5m tall. They can be flat, folded or curved and are either be fixed directly onto existing wall surfaces using bonding technology, or they can be cast with an integrated lightweight metal frame and fixed into walling systems. Tactility Factory currently commercialises four techniques: Linen Concrete, Stitched Linen Concrete, Velvet Concrete, and Crystal Bead Concrete. (SEE IMAGE X) All techniques use specifically designed, multi-layered textiles and techniques, and all require specific concrete recipes. The results are beautiful to touch and elicit strong responses. Tactility Factory is currently targeting high-end, interiors markets as the entrance market[7]. However we believe that the technology has much wider *off-the shelf* applications than our current *haute couture* products. That's because in addition to creating highly innovative surfaces, the technology developed by Tactility Factory extends the characteristics and thus the potential of concrete, from a cold, grey, acoustically harsh and unappealing substance into something warm, colourful, acoustically soft and humane. For example, the technology could also be applied to more everyday spaces where concrete is exposed to increase the thermal mass but which would benefit from a softer acoustic environment. Our technology allows us to manipulate the upper surface of precast concrete without the need for expensive moulds or costly post-production processes, since it is the textiles that articulate the surfaces and create the magic.

Beyond creating beautiful products, Tactility Factory is also actively engaged in cultural production. We exhibit work in cultural contexts; contribute to discussions around creativity and enterprise; and write and talk frequently about the work in relation to textiles, architecture, craft, feminist practices and material cultures. This is a two-way strategy. Firstly it helps us better articulate the work, tightening the process, and secondly because as people engaged in teaching and learning we instinctively want to openly share our learning with others in the hope that others might build off some of our efforts.

Surface patterns

This section will be represented graphically – interjected with images of the process and surfaces- more of a photo journal

Key Dates

Project starts 2005

Wins innovation awards /Creative industries funding

Project moves out of academia 2009

Private investor comes on board 2012

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[6] We currently hold 2 US patents, 1 UK patent, and 2 EU patent-pending.

[7] Such luxury markets are contrary to our politics, however given the level of innovation in the products, they serve as a route to wider markets and applications.

Scoping out the marketplace 2012-13
Large investment Feb 2014
New Premises/ CEO appointed April 2014
Additional Staff appointed Aug 2014
Permanent Staff appointed Jan 2015

People
Ruth / Trish – part-time
Production people (Concrete and Textiles) – adhoc/Part-time / FT
Designers: Graphic designers/Photographers/other textile designers
Consultants: Patent Attorneys/ Marketing consultants/ Business consultants
University Support
Family support
Board
CEO- full-time

Language
First named 'Girli concrete' , Dec 2005
Third nomenclature… the naming of things in our own terms.. skins, 2007
Conceptual language "ooh-ouch" experience' 2008, 'Making mad ideas sane' 2009
Renamed: 'Tactility Factory', 2009
Insisting on 'She' throughout the investment legals, 2013
Strokies (2014)

Technological Development of Materials

Objective	Method
Material Development and testing	Material experiment and comparability tests: using a process of 'spreadsheet' critique
	Testing fibres and chemical processes related to textile production for resistance in alkaline environment of concrete
	Trialling permeability of textile constructions to concrete constituents
Developing Textiles only for use in concrete	Developing and trialling textiles with various woven structures.
	Deconstructing and reconstructing existing base textiles to suit processes.
	Investigating textile finishing techniques and interaction with concrete
Developing Concrete for use only with textiles	Developing mix for 'face-mix' specifically adjusted to textiles and developing a separate 'back-mix' that creates the overall structure of the panel
Refining Process and Product	Refining and 'crafting' the technology through quality controlled processes and simple repetition, both in the textile and concrete production
	Initial Acoustic Testing (with Sheffield Uni) and Development of Surfaces/ Fire Testing (BRE)
	Developing Fixing methods for various contexts
	Trialling technology with external partners (concrete and textiles) to test scalability in production.
	Investigating other potential applications of the technology developed (working with BRE and Concrete Centre)

Culture of Materialism

Introduction to business plan culture through RCUK business plan competition – included weekend workshop and shortlisted for mentoring Sept 2007

First commission: Presentation plaque for HRH Princess Anne from WISE (women into Science and Engineering) Nov 2008
2nd and competitively won commission: Derry Playhouse, March 2009
Big Idea Award (Dec 2008)
25K (Invent) award (Sept 2009)
Patenting process begins (Jan 2009)
New Company Premises (Nov 2009)
Local commission Private client (August 2009)
Local commissions Restaurant and Private Residence (Sept 2011/ Dec 2011)
Pitching for investment (Dec 2011)
Private investor (April 2012)
Marketing consultant (2012-13)
International tradeshow (2012)
international commissions _ again all female specifiers (Summer 2013)
UK patent (Sept 2013)
Women's hour- BBC Radio 4 – 9 minute feature – 6million listeners (July 2013)
Large-scale investment (Jan 2014)
First US patent! (Feb 2014)
Appointment of Full-time CEO (April 2014)
Building of new office in new premised: The TRYpod (April 2014)

Communication

Blog- girliconcrete.blogspot.co.uk Started Jan 2006
The Animation (April 2008)– early tool to show the scale of ambition at a time when the technology was still unresolved
Citations
Exhibitions
- Flocked Exhibition
- Kentucky
- Palestininan
- Museum of the Here and Now

Writing
Social Media- Facebook, @Tact_Fact, Pinterest

GET LIST FROM REF SUBMISSION DOCUMENT OF WRITING ? EXHIBITION / CITATIONS ETC

Summoning the Muses: How and where does feminist writing support this practice?

Tactility Factory's work has been informed by feminism and the politics of inclusion from the beginning. Prior to involvement in the Tactility Factory project, inclusive design had been one of my main areas of interest[8]. Through that research I met the architectural academic Leslie Kanes Weisman, then a frequent contributor and keynote speaker at international universal design conferences. She had also been one of the cofounders of the Women's School of Planning and Architecture that ran between 1975-1981. Her work was based on a belief in equality and on a society that honors human difference. Her term, 'honoring difference' alongside the title of her publication: 'Discrimination by Design' acted as an early provocation for me (Weisman 1994). Like Weisman I had initially thought that reconfiguring architectural space/product was the key and should be the focus of my work. However Inclusive design also highlights the need to bring the users' experience into the heart of the design process and, perhaps more importantly in respect to where our work in Tactility Factory has gone, it emphasizes the significance of sensory stimuli, beyond the visual, to allow a wider spectrum of people to access and interact with and within the built environment. The concept of tactility is also part of wider critiques of modernism in architecture that challenge the dominance of the visual and call for the corporal and psychological experience of space to be better understood and elevated to greater significance (Levin 1993, Holl, Pallasmaa et al. 2006; 1994). This sensibility was also echoed in the engineer Peter Rice's impassioned plea to reinstate the 'trace de la main' in the construction process, or, to

> *"..make real the presence of the material in use in the building, so that people warm to them, want to touch them, feel a sense of the material itself and of the people who made and designed it."* (Rice 1994)

This concern for those who build the built environment or make the materials and components of the built environment is frequently overlooked in inclusive design discourses, mostly because of the politics that initially drove inclusive and universal design, but also because production of buildings and their elements is perceived as mechanistic process which is more or less anonymous.[9] However the removal of the maker's presence and sense of hand leaves us with the building materials and components that meet technical performance standards but rarely human performance standards. In other words, the core materials, components and systems that make up the built environment are rarely considered in respect to the experience of the end user. We rely instead on the skill of the architect to use these *technically performing* building elements to create environments that *perform for people*.

We began to see that somewhere in the space between manufacturing of building products to meet technical specification, and designing spaces for people, there was a unique position for our project. Rather than wait for the architect to intervene at a spatial level, the architect/ designer could drive a 'humane' specification process by sitting right at the heart

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[8] Inclusive design is also known as universal design and design for all. See the following websites for further information on Inclusive / universal design:
http://www.designingbuildings.co.uk/wiki/Inclusive_design#Inclusive_design_and_universal_design
also Principles of Inclusive Design Report (CABE, UK) at
http://www.apho.org.uk/resource/item.aspx?RID=92350
Also own writing on 'Building and Sustaining a Learning Environment for Inclusive Design' (2002) at
https://www.academia.edu/10252598/Building_and_Sustaining_a_Learning_Environment_for_Inclusive_Design

[9] Inclusive / universal design was driven initially by disabled rights movement and had historically been focused on access to the built environment.

of the manufacturing process of building components and materials.

In Tactility Factory we deliberately interweave processes to ensure the product is 'felt' into being as much as it is pre-imagined and designed. The processes of design and fabrication, digital and analogue, inform and are formed by one another. By collapsing the space between representation and fabrication we hope that the surfaces speak of craft, care, precision and intimacy. 'No matter how technically complex or theoretically informed the process is, or how effective or innovative the manufacturing becomes, the single most important characteristic of Tactility Factory surfaces is the quality of the user experience.' (Morrow, Belford 2012)

Alongside the subject of Tactility Factory's interests ie tactility and the emotional aspect of materials, our processes and the dynamic of the work are strongly influenced and supported by feminist thinking. One such influence is the feminist author and activist, bell hooks. In her 1989 biographical-theoretical essay, "Choosing the Margin as a Space of Radical Openness" hooks documents her own struggles, as a black woman becoming an educated social activist and author. Most relevant to our experience is hooks' incitement to move to the location of radical operation; to choose **not** to locate oneself on the side of what she calls the "colonizing mentality", but to stand in political resistance. She writes that, 'The choice is crucial. It shapes and determines our response to existing cultural practice and our capacity to envision new, alternative, oppositional aesthetic acts. (hooks 1989;2000)
However our instinct, and more recently our insistence, has been to hold positions that are both mainstream and peripheral; that allow for 'madness' and utopia, alongside deliverable outcomes. We aim neither to conform nor retreat, but these are challenging positions to maintain. At the same time, hooks also speaks of the need to use the oppressor's language in order to communicate: so even when one occupies a marginal position, one can still use mainstream tools in order to function, and indeed reach a wider audience. When translated to the work of Tactility Factory, we readily acknowledge that we work within worlds that are not *easily* ours (commerce and concrete). These are not places where we feel wholly comfortable, yet we understand the importance of holding those positions and making use of those contexts and cultures in order to achieve our goals.

We were also empowered, perhaps unexpectedly, by the 1892 novel, *The Yellow Wallpaper,* regarded as one of the earliest pieces of feminist writing. (Gilman, Bauer 1998) It has acted as a muse on several levels not least the idea of a replicating a yellow wallpaper surface (IMAGE). It is the story of a woman suffering from post-natal depression, confined by her husband to an attic bedroom. In her sky-lit room, the yellow wallpaper initially becomes her obsession and finally the manifestation of her madness. Denied access to writing material, her mental health deteriorates. She narrates the wallpaper – charting how patterns within patterns appear and disappear depending on the light, the time, her mood. Ultimately, she becomes part of the wallpaper, taken into the skin of the wall and freed from her torment. It is a distressing story, but there is also a liberation in it; a discovery of the complexity and potential of simple patterns within patterns; an intellectual release in allowing the imaginative mind to find another place to exist: a place of 'ecstatic' freedom.

In our own dark moments we compare Tactility Factory to that attic room; as a place to be free of the orthodoxy of conventional practice and escape through pattern and surface to a place of other potentials. We also hope to add an addendum to *The Yellow Wallpaper*, offering Tactility Factory as a place where the woman can regain her sanity. During the course of the work we have frequently talked about 'making mad ideas sane', but in order to do so, we first have to create a space that supports madness. (Morrow and Belford 2012)

These feminist authors, Weisman, hooks and Gilman and others, provide provocation and stimulus to our work but across the time span of Tactility Factory there have also been four reoccurring areas of reflective development in our practice. We think of them as: *the timing of work*, *mediating nomenclature* and *tacit technology* and *weird networks*. They have irritated, festered and eventually been managed if not resolved. Again it has been writings on the female experience that have supported the shift in our understanding and gradual gain in confidence.

The Timing of Work (and Play)

Time plays a significant role in gender studies. Breaking free of domestic drudgery through time-saving domestic devises, such as washing machines and dishwashers, has supposedly led to an increase in women's involvement in the labour market. (Roberts 1991, Birch, Le et al. 2009) Yet the 'second shift' phenomenon first identified by the sociologists Arlie Hochschild and Anne Machung in the late 80's, where working-women return home to complete the housework shift, is still manifest in current research findings and continues to curtail women's engagement with high-demand careers. (Hochschild, Machung 2012; 1989)[10] Spatially, the planning of cities into distinctive zones (shopping, work, residential) also impacts on women's time. Their caring roles frequently lead to protracted and multi-nodal journeys between home, school, work, and health services.[11] Valerie Bryson defines this strain on women's time as 'time poverty' and argues that the unequal distribution of 'disposable time' amongst the genders affects women negatively in two ways. Firstly, that having disposable time for the individual is a 'primary good in itself,' and secondly, that it is a resource that citizens need if they are to further themselves; promote their concerns; and contribute to local politics and decision-making (Bryson 2007). As such, time poverty acts as a constraint on the active and valued citizenship of women but, perhaps more critically, she argues that women fall outside normative 'time cultures' and that their temporal rhythms do not sync with the 'commodified clock time of the capitalist culture'. Hence women's time is undervalued and fails to connect to mainstream power structures. Kathi Weeks brings the discussion to another level, in 'The Problem with Work: Feminism, Marxism, Antiwork Politics and Postwork Imaginaries', where she critiques the 'sometimes pro-work suppositions and commitments' of feminism (and Marxism), and fundamentally questions whether work is in fact an inevitable activity at a time when increasingly 'there is not enough work to go around'. She argues for a reduction in work-hours without a reduction in pay, as much to enhance peoples' productive and creative practices and experiences, as to provoke a reconceptualisation of the role and value of work in society. It is a deliberate provocation designed 'to challenge the dominant legitimating discourse of work'.(Weeks 2011) Thus in Kathi Weeks' petition for reduced working hours she is also hoping to engage us in a deeper questioning, politicizing, and thus, reforming of the work environment.

Time/work/play relationships have certainly created significant moments of reflection for us in Tactility Factory. Maintaining a playful attitude is critical when developing ideas and 'things' beyond normal realms. So accepting that the interrelationship of work and play (non-work) has always been critical for women in society, helps us to understand how to

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[10] See also: McGinnity, Frances and Russell, Helen, *Gender inequalities in time use: The distribution of caring, housework and employment among women and men in Ireland,* The Equality Authority ; Economic and Social Research Institute, 2008. Dublin, Ireland. https://www.esri.ie/UserFiles/publications/20080612164547/BKMNEXT113.pdf. Accessed 7th January 2014

[11] *Women in the City. Housing, Services and the Urban Environment*. OECD Publishing, Aug 1995. See http://www.wikigender.org/index.php/Cities_-_Women_in_the_city_-_OECD_Conference_1994

manage the tensions and resist two-dimensional readings of how we handle our own time/work/play relationships. We have faced time-strains in two *obliquely mirrored* areas, firstly within the materialist culture of business, and secondly within the culture of material practice.

Time in a Materialist Culture

The project of Tactility Factory has always been a part-time endeavor. Both co-founders provide the sole income for their respective households, so maintaining a full-time paid job in academia has been a necessity. But being part-time in Tactility Factory (i.e. 1 day a week, evenings and weekends) has inevitably meant that the development of Tactility Factory has been slow. The general perception in business is that slow growth indicates low market and potentially no-market traction. In addition working 'part-time' is frequently understood as a sign of lack of commitment and, as Bridgit Fowler and Fiona Wilson suggest in relation to architectural practice: being part-time risks marginalization. (Fowler, Wilson 2004). However we argue that our prolonged engagement in the development of Tactility Factory (10 years) is in fact a sign of doggedness and determination. Maintaining intellectual engagement in the project has never been a problem, however, sustaining emotional commitment over such a long protracted period has been, we would contest, an extraordinary feat of belief and will-power– especially during challenging times. Of course the undisclosed reality of 'part-timers' is that they tend to be multiple part-timers i.e. they carry out multiple roles at the same time: as workers, mentors, carers, volunteers etc.

This lack of understanding of the basic drive behind part-time engagement is of course identified as one of the reasons why women fail to break through glass ceilings. As a recent Wall Street journal essay suggests, the key is to 'rethink the clock' by designing jobs that 'enable people to contribute at varying levels of time commitment whilst still meeting our overall goals for the company' (Millar 2013). One consequence of working part-time is that collaborative pre-planning becomes critical in order to evade last minute, rushed decision-making. In this aspect, the technology of 'the cloud' and synced diaries has been liberating for us. Similarly the Wall Street Journal essay differentiates between 'availability' and 'absolute time commitments', suggesting that women might be willing to be more reachable during out-of-office hours if they could trade that for more flexible blocks of time. Similarly, Parlour, the insightful and liberating Australian project that 'brings together research, informed opinion and resources on women, equity and architecture', published guides in 2015 that aim to improve the architecture profession for women. Of their eleven guides to 'Equitable Practice', three deal directly with the work/ time relationship i.e. 'Long-hours culture', 'Part-time work' and 'Flexibility', demonstrating not only the significance of time in work cultures but also pragmatic ways to bring about change. [12] There is clearly an urgency to re-conceptualize work/time relationships.

Time and Material Cultures

Acknowledging that time really is *of the essence* to Tactility Factory, we have learnt to manage it tightly and look for ways to be more effective in shorter periods. Nevertheless we also have come to learn the importance of 'taking time'. This understanding emerges from working with the materials themselves.

[12] http://www.archiparlour.org/parlour-guides/ (Accessed: 9th May 2014)

In the early stages we talked of creating a hybrid material, a textile/concrete surface.[13] But describing the work as hybrid somehow implied that the process was simply a matter of 'sticking' two materials together- and for the most part that is what onlookers still think we are doing. The quiet, unassuming quality of the surfaces however belies the complexity of the technology, the cyclical and incremental processes of testing and development, and the craft and technical expertise invested in the process. (see table X for the multiple processes passed through). In addition, we bring together not only two materials but also their two distinctive cultures: concrete and textiles. It is no coincidence that the two cultures have rarely been placed together: they seem at times to be almost antithetical. Both have strong gender associations and both have differing stances to technology. Tactility Factory has created a space where the two cultures meet, work together and form a third culture and new material practice. This requires not just transformation of established processes and tools but also soft, personally-held beliefs. Such cultural shifts also take time.

We no longer use the term hybrid since it leaves an incomplete impression. The outcome is not equivalent to 1+1 but rather produces an outcome that is much more than the sum of its parts. This is a new material from a new type of material praxis. In this context time, or rather part-time engagement (which in turn becomes down-time, up-time, thinking-time and drawn-out time), has been the context for a reflective and critical process. Time in such contexts becomes the underwriter of quality, and indeed may also prove to be the guardian of our Intellectual Property.[14] But, 'taking time' is an unusual strategy in the 'bring-it-to-market-as-fast-as-you-can' culture of commercialisation. Without the influence of those feminist writings that disclosed the potential for time itself to be a gendered concept we might have been more prone to anxiety about the time-scale of Tactility Factory's processes. As it is, one might now argue that contemporary material practices need more, not less, part-time engagement.

A Mediating Nomenclature

It is argued in feminist writing that the association of masculine with rationality is due the colonisation of language by men (Hekman 1990). Barbara Fried notes that the development of gender identity in children occurs at the same time as their language development. (Fried 1982,49) In other words, language has the potential to lock us into gender roles and the societal misconceptions and misrepresentations that surround them. More recent thinking is that language forms and is informed by reality. Deborah Orr's appropriately textile-related argument is that for Wittgenstein 'the body and lived experiences are the weft into which language is woven to create the pattern of our lives'. (quoted in Hekman, 2008). Throughout Tactility Factory we have developed and deployed language on several levels: initially as a means to excommunicate, that is, to exclude people from our discussions and more latterly to create a common language, fit for purpose, across a diverse team with unique processes and products. In the early stages of development, we found that trying to respond to the enquiries of skeptics was time-consuming and at times degrading. As

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[13] See: Morrow, R., Belford, P., *Soft Garniture: developing hybrid materials between academia and industry*. Paper published in proceedings Roaf, S and Bairstow, A. The Oxford Conference: A Re-Evaluation of Education in Architecture. WIT Press, 2008. Also
A Hybrid Practice- Between Design and Craft. Paper presented at 7th Conference of the International Committee for Design History and Design Studies. ICDHS 2010. September 2010 Brussels, Belgium.

[14] Intellectual knowledge can always be replicated and transferred but tacit knowhow, gained through experience of the technology over time, is, as our patent attorney explained, the acknowledged way to secure IP from illicit replication. See also: Ashish Arora, Licensing Tacit Knowledge: Intellectual Property Rights And The Market For Know-How. In Economics of Innovation and New Technology Vol. 4, Iss. 1, 1995 . p 41-60

designers what we understood as conceptual maquettes looked to others like rather poor concrete samples. It looked unskilled and risible, so once when asked what we were doing, we spontaneously called the work 'girli concrete'. This provocative response effectively closed down further discussion.[15]

As the project has developed we have created new names for the designs. In the textile culture, designs, patterns, colours and ranges are all, very purposefully, named. As an architect, I was unfamiliar with this almost anthropomorphic naming process. It is of course functional in terms of cataloguing, but it also serves to crystallize the conceptual thinking behind the object and, to some extent, legitimise the process. It is also a pleasurable, reflective and mischievous moment when we mark the significance of a completed design. Less consciously and driven more by necessity, we have named the new technical processes by which we combine concrete and textiles. We have adopted language that allows people to understand what it is we do and what we have achieved. And in this respect we try to use more accessible, 'bridge-building' phrases. Such examples are:

> *Making mad ideas sane*. This is a challenging phrase since madness is rarely a declared tactic in the world of business, but we use it to assure others that we are experts in controlling this creative transition.
> *Linen and concrete are like vinegar and chips*. This phrase is used to explain how two unconnected, disparate materials can work uncannily well together.
> *The ooh ouch experience*. This phrase emerged to talk directly about the contrasting, tactile and emotive experience of Tactility Factory surfaces.

When we write and talk about the work we like to use titles that convey transgression and reveal our gender. Titles such as 'Fabrication and Ms-conduct' or, as in this case, 'Material Witchery' are used to indicate an anti-authoritarian stance – we are after all not only women but also designers.

Over the last few years we have gone through two investment processes that involved lengthy legal documentation. In the first process we were trusting of the professionals around us but by the second time we wanted more control and clarity. We asked for each piece of legal jargon to be explained, if need be, several times until we understood it and we no longer accepted the lawyers' arguments that the law regards the term 'he' as neutral. On revisiting Leslie Kanes Weisman's writing we found reference to Dale Spender's book, 'Man Made Language' (Weisman 1994, 6) which led us to read more about the link between language and feminism. Susan Hekman explains that the terms 'he' and 'man' are neither neutral nor generic, nor indeed do they include the experience of both men and women. Her argument was: if 'he' and 'man' cannot replace the terms 'she' and 'woman' in <u>every</u> instance, then they can not replace them at <u>any</u> instance. And she humourously used the phrase 'he had a difficult childbirth' to provide evidence of the prevailing nonsense of gendered language. So despite our qualms, we insisted that the language be changed throughout the company's legal documentation in order to recognise that Tactility Factory had been founded and driven by two women. The language changed overnight to 'she'. It was a small gain; probably no one even noticed the change, but it was significant moment for us. We call it our 'she-she' moment.

On a normal day, words and phrases specific to Tactility Factory are used that have never been used in those structures or combinations before. We have become increasingly aware

[15] Interestingly the term girli concrete stuck: we used it for the name of our first blog; others continue to refer to it; and indeed we still hold the EU trademark for the term 'girli'!

of the language shifts we are engaged in. An email from our new CEO (male) contained the phrase : *'I've just packed a Lichen in Fig plus a Smoke Strokie and will send it off to them this evening.'* The term 'strokie' is the name Trish generated to describe the samples we send to clients to demonstrate our palpable expertise in creating tactile surfaces. The development of this mediating nomenclature is in one way a necessary outcome of a practice across two diverse cultures. But it offers more than a pragmatic underpinning of collaboration – it also is a place of self-determinacy: illuminating and generating new possibilities. New language drives new practice, or, in tune with the theme of this essay, spoken incantations invoke transformation.

Tacit technology

Our aim of making hard things soft is supported not just by cultural and conceptual drivers but also technological. Understanding the concept of technology became a central investigation for the work. We turned again to feminist writers for insight and found the majority of the writing centred on technology and the body, reproduction, communication and cyberspace. (Hopkins 1998, Layne, Vostral et al. 2010) However one author offered an insight that has remained significant throughout our efforts: Judy Wajcman. (MacKenzie, Wajcman 1985, Wajcman 1991) She proposes a three-layered definition of technology. The first layer is the technological 'things': the hardware and software, those components we usually associate with the term technology. The second layer is a form of knowledge that surrounds the 'thing' and arises during the making, repairing and maintaining of the thing. This, she says, is a tacit form of knowledge, which is visual, even tactile rather than simply verbal or mathematical. This is knowhow. (The same knowhow with which patent attorneys seek to secure intellectual knowledge). The third layer of the definition is the interaction of people with knowhow and the thing. For Wajcman, human interaction is an implicit component of technology. All three layers of the definition are interdependent. This socialisation of technology is also emphasised by Deborah Johnson when she explains, 'Technology *is* the combination of artifacts together with social practices, social relationships and arrangements, social institutions, and systems of knowledge.' (Johnson 2010)

In Tactility Factory we have become interested in the definition of technology, chiefly through our comparative conceptions of and approaches to technology, across architecture and textiles. Technology occupies a central position in architectural practice both operationally and theoretically. Across history many conceptual and stylistic shifts in architecture have been interdependent with technological advancements. Such technology-led architecture often has strong visual impact, but the experience of the resultant spaces can be asocial and at times alienating. Alberto Perez Gomez suggests that in such instances; "Technology substitutes a 'picture' for the world of our primary experience." (Pelletier, Pérez Gómez 1994) In contrast, interacting with a textile is personal and unique: a cosy, cuddly, slippy, scratchy, warm encounter. Simultaneously one experiences an intimate physical and aesthetic reaction. Trish, as an experienced textile designer, has spent her career using chemical and mechanical processes (abrasive/ corrosive technologies) yet she had never described herself as a technologist – until I started to. It is the noteworthy achievement of textile designers to take a variety of *hard-core* technologies and use them to transform and combine yarns into an artifact that evokes emotive responses. In other words, technology may be core to the textile designer's process but it is rarely present in the final experience of the product. For architects, textile designers' skills, in using technology, gives us much to reflect on.

But of course the issue isn't just one that is related to the various domains, it is also gendered. According to Cynthia Cockburn it was the historical segregation of the labour market that led to the 'construction of men as strong, manually able and technologically

endowed, and women as physically and technically incompetent' (Cockburn 1983) Johnson sees this from another angle, arguing that 'domains of knowledge and skill mastered by men are called technical or technological while those mastered by women are considered crafts'. And perhaps this is historically what happened with textiles. That somehow, whether by design or context, the technology inherent in textiles was downplayed in favour of a narrative that spoke of the sensory experience of the outcome. In Tactility Factory we have learned to tell various stories depending on who is listening. To the interior sector, we talk of the sensuous nature of the surfaces; the ability to create atmosphere and quality experience. To architects and engineers we speak about the cutting edge technologies, the patents and the awards for innovation. We make the most of explaining that it is the textile technology that is the *clever* component of our surfaces – it's a coded and loaded emphasis of course.

So does this mean that Tactility Factory generates feminist technology? Linda Layne, professor of anthropology asks: 'Are feminist technologies simply or necessarily artifacts 'designed by women, for women'? If a technology is feminist, how did it get that way? Is the feminism in the design process, in the thing itself, in the way it is marketed, or in the way it is used by women and/or by men?' (Layne, Vostral et al. 2010). In the case of Tactility Factory, whilst the process was initiated and led by two women, both genders and gendered cultures have been part of its development. While the process is certainly informed by feminism, we would agree with Layne's concluding statement that 'what matters is their [technologies'] effect and not their intended effect'. Certainly our wish has been to create a wider understanding of technology that includes us and allows us to practice with confidence but in a manner that produces outcomes for all people. In the end of course only the user can really judge our success.

Weird Networks: women supporting women

'Weird Networks' bears witness to two references. Firstly Shakespeare's 'Weird Sisters' later to become the 'Three witches' in Macbeth, and secondly to the derivation of the word 'weird' from the German verb 'werden' and the Old English 'weorðan', both meaning 'to become', hence this section looks briefly at women's networks and their role in *becoming*.

The American Architectural Historian, Sara Holmes Boutelle, in her seminal work, 'Julia Morgen, Architect', brought the prolific work of the architect Julia Morgen (1872-1957) for the first time to the attention of the public and profession. Morgen had headed up her own architectural practice for over 40 years in San Francisco, and by her death at the age of 85 in 1957 had completed over 700 buildings. Boutelle records that over 50% of her clients were 'institutions for women or women commissioning domestic buildings' (Boutelle, 1981) . At that time in history not only was it surprising that Julia Morgen was such a successful architect but that so many women (acting either as individuals or leaders of organizations) were even recorded as clients. Like men, women clearly draw on networks but it might also be argued that Morgan's existence 'drew out' and developed the client in women. Boutelle concludes that 'These women's institutions and the women clients has a consciousness about their womanhood and about the support of other women that led them to patronize a woman when a qualified women was available'. Despite being told that only men have the financial acumen to purchase our products, we have witnessed the same phenomenon in Tactility Factory, where the overwhelming majority of our commissions come from women.[16] Of course, they might in the end be spending men's money but it is women who

[16] We were approached by a Producer to be interviewed for BBC Radio 4 Programme, Women's Hour, one of our business advisors queried the return on time invested in such a programme, given that

decide how to spend it and they seem to take pleasure in commissioning the work of other women. We have also been greatly supported by those who curate exhibitions, promote innovative business ideas, and look for new applications of concrete and whilst such supporters may not be exclusively female, they are predominantly so. It is this potential for the work such as Tactility Factory to create relationships that haven't been in existence before that interests us. We think/hope such work as ours allows others to reflect on their own work with confidence and renewed spirit. In this we are not so much interested in female-only networks but rather the development of open, charged, organic and friendly networks i.e. *weird networks.*

Spinning Spells: Closing/Opening observations on Tactility Factory.

'*She changes everything she touches, and everything she touches changes*.'[17]

In conclusion I would like to reexamine how the practice of Tactility Factory has endeavored to be ethical, and discuss the tactics and thoughts that have helped sustain this practice and may support future practices.

Our instinct has led us to engage with *stuff,* on the ground, and in the melee, despite this being at times a challenging strategy. Our preference is to develop an ethical practice rather than be assured of, or purport to have, well defined ethical principles. This ethical journey began through a commitment to inclusive, people-responsive environments, where we initially sought to amplify sensory stimuli, designing built environment materials as much for human performance as technical[18]. Increasingly we have tried to condense the care and craft of the maker so that the resulting surfaces feel, and are, *touched*. Indeed the longer we work on the project the more we realize just how radical the enticement to touch can be. When people engage through touch they do so out of an honest, intuitive urge, that is beyond the intellect and almost beyond their control. Looking at Tactility Factory's surfaces is never sufficient. We frequently observe the moment when an individual realizes that only by touching do they fully understand. It is of course a fleeting experience yet perhaps it is growing need and we are witnessing the manifestation of Li Edelkoort, the Dutch trend forecaster's 2012 prediction that, 'super technology is going to ask for super tactility' i.e. the more we live through the virtual the more we crave the material.[19]
Alongside this interest in tactility and touch, we are keen to understand how the technology and tactics of Tactility Factory might trickle into other areas. Recently we have started to work with local manufacturers and with sustainable concrete and textiles, returning to earlier processes to unpick and rethink an ecological approach. In such a dynamic landscape we try to hold onto an ethical approach by intertwining and juxtaposing action with theory, utopia with 'real-life' and detail with strategy. Doing so allows us to actively compare, contextualize and analyze the practice of Tactility Factory, helping us to better articulate our

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'women did not have the money to buy our products'. We argued that cultural exposure to 6million weekly listeners was more critical.

[17] Words taken from a pagan chant in the American feminist activist, Starhawk's publication, (1979;1999) *The Spiral Dance*, HarperOne. 20 Anl Sub Edition, p69.

[18] Thanks to Meike Schalke for identifying that the role of the architect in material development is relatively unique and worthy of more discussion. Within the scope of this paper it wasn't possible but we will aim to address it in future writing.

[19] Li Edelkoort at Dezeen Live. http://www.dezeen.com/2012/12/28/super-technology-is-going-to-ask-for-super-tactility-li-edelkoort-at-dezeen-live/

position and share experiences. Sharing through writing, presentations and teaching is part of our ethical concern for open dialogue. However by far the most demanding ethical dimension of our practice is the ongoing attempt to consciously engage in business as women i.e. as people who sit outside normative business cultures and structures. Defining and refining our position (for example, in relation to time, language, technology and networks) through feminist reading has unquestionably helped in this endeavor. For the most part other people's writing helps us to understand what the problems are and to resist attributing them to localised conditions and/or internalising them. At times we have looked, but to no avail, to find positive insights or acknowledgements that might support Tactility Factory. It's here that reading Elizabeth Grosz helps to understand that this might be the condition of all of us struggling for a feminist path forward (Grosz 2010). In her essay, 'Feminism, Materialism and Freedom' – an essay I read several times before the moment occurred in my life when I could understand it - I realised she had a similar frustration with feminism being constrained by 'the paradigm of recognition' – by that she means looking to be valued, and she rightly asks 'who is it that women require recognition from?' Instead she opens up the concept of freedom, suggesting we consider not freedom *from* (oppression, coercion) but rather pursue the concept of freedom *to*.. act, give voice etc. She says that the challenge facing feminism is 'no longer only how to give women a more equal place within existing social networks and relations but how to enable women to partake in the creation of a future unlike the present.' And it is at the moment of reading that final sentence in her essay that I know we are on the right track. We have been fortunate enough to have the freedom of being located in the academia, and we have exploited that freedom as best we can in order to develop an approach and set of outcomes (physical and cultural) that are unlike anything that has been before – to help create a future unlike the present.

And what about the question of being valued? Whilst we have the support of many women, sometimes we wonder whether our witchery has created something that only women can see- the lack of mainstream interest in the work of Tactility Factory to date is marked. Of course Grosz is correct in asserting that we need to build our own value systems. Yet like many women we still sit within systems in which we have to deliver outcomes in a way that matches to the dominant construct. As full-time academics this means justifying the work as academic research. To that end we were in supported and inspired by a colleague at another institution. We have chosen her words to acknowledge the importance of other feminists to this body of work and to our growing commitment to material witchery.

> 'Only by acknowledging the work of earlier feminists, can we operate 'behind', adopting ways of working that critique those who have gone before. Only by going forward can we imagine a world as a yet-unrealised female subject. Only in this state of mind, between past and future, can we open ourselves up to encounters with the other. We travel the distance to transform as well as transgress.' (Rendell 2007)

Our greatest challenge in Tactility Factory has definitely been to maintain a playful, transgressive state of mind, avoiding default and conventional positions. So the spinning, twisting and threading of a feminist approach throughout the practice has strengthened our resolve and commitment to the work. Perhaps it has even become physically embedded in the surfaces. Certainly the resultant artefacts of this witchery help to sustain our engagement. The surfaces are beautiful, tactile, and always surprising and even when encountered on a daily basis they still retain an enchanting, magical materiality.

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