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Materials that linger: An embodied geography of polyester clothes

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Narratives of clothing reuse and repurpose have centred on second-hand economies, recycling, upcycling and DIY, fashioning a particular kind of ‘wasted’ aesthetic where stitching, darning and patching become visible. But what of clothes that don’t show signs of wear, because they are made from synthetic fabrics that degrade much more slowly than organic materials? Drawing on ethnographic ‘fashion journeys’ with young adults from Sydney, Australia, this paper follows polyester clothes, geographically and temporally, beyond spaces of production, to their everyday use, storage, divestment, reuse and recirculation. Clothing is theorised as always in-process – materially, temporally and spatially – and understood haptically through relations between agentic component materials and human touch. Reconfiguring concepts of fashion waste questions how clothes become redundant: their material memories instead lingering in wardrobes, in stockpiles of divested objects and hand-me-downs, entering cycles of second-hand trade and ultimately, landfill. Polyester manifests a particular variant of material culture: both mundane and malignant, its feel and slow decay result in clothing that seldom slips from the category of surplus to excess in clear ways. An embodied approach, focused on materials and haptic properties of touch and ‘feel’, reveals the contours of an otherwise opaque everyday geography of clothing waste.

Introduction

Steph draws aside a set of clothes set neatly on hangers, sighing as she pulls with the weight of her body to search for clothes that have found their way to the forgotten liminal space deep within her built-in wardrobe. It is the spot, Steph tells me, where unresolved or ambivalent garments live. Her hand disappears in between the clothes, re-emerging after a short time with a black and red jumper. The material fibres are long and feathery. As Steph draws it out to the light the fibres dance and the fabric shines. Holding the jumper by the shoulders Steph says that this jumper is ‘really old’ but ‘really comfy’. It shows some signs of wear – bald patches from bodily friction and some pulling around the neckline – but it does not look old.

Steph – 19, full-time international student, share household

The object above, described from an ethnographic encounter that informed this paper, provides an entrée into the accumulation, abandonment and lingering of clothes. There is much waste in clothes. Clothing is based on an aesthetic market that fetishises the new to replace the old, even if the old is still ‘good as new’ (Binotto and Payne 2017: 8; Entwistle 2009). The speeding up of production, innumerable trends and multi-seasonal cycles, and increasingly short stays of garments within wardrobes all amplify clothing waste (Binotto and Payne 2017; Emgin 2012; Norris 2012a,b, 2015; Fletcher 2016; Gregson and Crang 2015). The purchasing, use and disposal of clothing accounts for up to 14 per cent of total household waste and between 7 and 10 per cent of a household’s total ecological footprint (Gibson et al. 2013). Figures suggest that the average person in affluent countries such as the United States, Britain and Australia consumes up to 27 kilograms of clothing, and discards 23 kilograms of clothing, annually (Allwood 2006; Cline 2013, 2014; WRAP 2014). More than 30 per cent of discarded clothing is destined for landfill (WRAP 2014). Clothing waste contributes to a range of ecological problems such as excess water use, and groundwater, soil and air pollution (Allwood 2006; Cline 2013; Fletcher 2014, 2016; Norris 2015; WRAP 2014). Clothing fibres are said to be the most abundant form of material waste (Siegle 2017). And indeed, the vast majority – up to two thirds – of

clothing made and discarded globally each year now features human-made materials, such as polyester, which draw on finite resources including crude oil (FAO/ICAC 2013). Problems generated by clothing waste have a lifespan that far outweighs their short fashionable life. This is especially so for human-made materials. In this paper, we trace human-made clothes geographically, following a material that has become ubiquitous in most clothes, and that especially lingers across numerous material and temporal scales: polyester.

The clothing textiles economy is awash with engineered materials that are adopted and manufactured into products to suit different object functions. The annual production of polyester now exceeds 22.67 billion tonnes (Cline 2013), making it the most produced textile globally. Yet seldom have such materials featured in material cultural geographic analysis. We follow polyester and its visceral relations beyond spaces of production, into everyday use, storage and divestment. We show how polyester's materiality – its very plasticity – unleashes an unsettling set of contradictory relations among clothes wearers: discomfort and comfort, disgust and appreciation, nonchalance and neglect. Both mundane and malignant, polyester's feel and slow decay mean that clothing seldom slips from the category of surplus to excess in clear ways. Key to our argument is that an embodied approach, focused on materials and the haptic properties of touch and 'feel', reveals geographies of clothing waste otherwise obscured from view.

We begin with a contextual discussion of the 'problem' of polyester. The emphasis here is to situate polyester materially across all scales of a garment's production, use and disposal – as a textile enrolled within global supply chains of the clothing industry, *and* as a hidden plastic derivative. Polyester is known to exert certain effects and impacts; its multiple forms and lingering qualities linking diverse actors, challenging understandings of waste, what forms waste takes, and where waste goes. From this material account of polyester we build an argument for an embodied analysis, attuned to material affordances, in the everyday spaces of clothing

wearing, use, storage, and divestment. Our empirical exploration follows, drawing on ethnographic research following the fashion journeys of young adults in Sydney, Australia. Ethnographic threads explore the meanings, values and practices of polyester in stories of clothing consumption. We follow polyester from purchase to wear, wardrobe to washing, and ultimately, as clothes become unwanted and unvalued. Our attention to everyday material relations involving clothes reveal complex embodied engagements between consumers and polyester – from attachment to disgust, pleasure to deception. Sensorial, emotional and evaluative engagements with polyester are key to unlocking its material politics, and challenge responses to problems of clothing waste. To conclude, we consider what a focus on polyester might add to current understandings of clothing consumption and disposal.

The problem of polyester

Consumers interact with the material qualities of polyester daily, but rarely do we think of ourselves as wearing plastic. While organic textiles like cotton or wool are marketed via their ‘natural’ origins, the derivation of polyester is passively concealed. Fabric engineering and garment design typically conceal plastic origins, making them unknown on labels and deceiving the wearer. Their goal instead is to mimic or approximate the ‘natural’ feel of organic fibres, while aiding textile flexibility, and reducing production costs. Even though a global industry worth \$US 467 billion, and employing an estimated 75 million people, the geographical provenance, production systems and environmental impacts of the textile and garment sector remain largely invisible (Brooks 2013, 2015a, b; Norris 2012b; Stotz and Kane 2015). Further, the swiftness with which fashions cycle and synthetic materials transform means that even if one is comparatively well-attuned to the properties of clothing textiles, a wearer can no longer be certain where and how materials are made (Küchler 2015). Amidst growing material excess, consumers are arguably less attuned to the strength and durability of clothing fabrics, what

fabrics and textiles are actually made out of, or how they work with the body or beyond in terms of their environmental impact (Hebrok and Klepp 2014; Hebrok et al. 2016; K uchler 2015; Fletcher 2016). The growing array of human-made textiles only renders the situation further opaque.

Polyester is best described as a category of polymers produced by mixing ethylene glycol (a petroleum derivative) and terephthalic acid. But polymers are not polyester fabric in isolation (Liboiron 2016). The process of making polyester is subject to numerous chemical additives and configurations. Hundreds of polyester varieties exist (Scheirs and Long 2003). In its simplest material form the poly(ethylene terephthalate) (PET) polymer is coarse, rigid and slightly transparent in shade, akin to off white. To promote the material characteristics of polyester - as flexible, soft, fluffy, vibrant, light - other plastic additives or monomers are added at various stages of the production process (Fries et al. 2013; Scheirs and Long 2003). Adding a delustrant like powdered titanium dioxide (TiO₂), for instance, removes the gloss and lustre of plastic, and creates a slightly rougher surface on fibres, reducing sheen and transparency, and increasing opacity (Windler et al. 2012). Other additives improve or modify appearance, elasticity, mechanical or thermal resistance, durability or performance (Fries et al. 2013; Napper and Thompson 2016; Li et al. 2010). In the final stages of processing, polyester fibres are combed, spun, woven or knitted at high speeds into finished fabric sheets that often closely resemble silk, cotton or wool (Schnieder 1994). The polymer build of polyester produces a hardwearing material that is slow to show signs of wear and tear (Fletcher 2014; Li et al. 2010).

Polyester sits alongside other plastics that are 'emblematic of economies of abundance and ecological destruction' (Gabrys et al. 2013: 3). The consequences of uncontrolled growth and persistent proliferation of plastic - in all of its forms - is, in K uchler's words 'one the greatest ecological, health and environmental challenges of our time' (2015: 272). Scholarship across geography (Furniss 2015; Phillips 2016, 2017), material culture (Liboiron 2016), cultural studies

(Hawkins 2001, 2006, 2009, 2013; Gabrys 2013; Gabrys et al. 2013) and design (Fisher 2004, 2013) has responded to the ubiquity of plastics, opening up conceptual and ontological considerations to engage the materialities of plastic, its scale, visibility, physical and temporal persistence, and interactions with human and non-human worlds. But despite its ubiquity, the plasticity inherent in polyester clothes, and everyday bodily relations with it, have thus far evaded scrutiny. One reason for this is that much commentary on the political-economic and environmental problems of clothing assumes their stability and ontological security – the unit of analysis being garments as finished, coherent objects. Whereas materials have been privileged in the sciences and engineering, there has been a tradition of general neglect in the humanities and social sciences (Ingold 2007; Küchler 2015). Materials have been deemed unsocial – ‘the raw stuff from which people would be able to shape cultural and social life, but in themselves not cultural’ (Drazin 2015: xvii).

Focusing instead on polyester as an agentic component material requires theorising clothes as always ‘in-process’ rather than as singular, stable or static ‘things’ (Ingold 2007, 2012; Dominguez Rubio 2016; Fletcher 2016; Stanes in press). Our approach to clothes-in-process considers clothes as collections of materials that are held together provisionally, and always in flux. Clothes are never stable, finished commodities but rather assembled items: assortments of fabric, thread, buttons and zippers in temporary coherence, awaiting further use and adaptation, and subsequent ridding and decay (Fletcher 2016). Clothing is conceptualised here as a temporary assemblage of agentic materials in transition, linked to upstream relational geographies of resource extraction, and manufacture (Castree 2001; Cook et al. 2006; Carr and Gibson 2016), and undergoing various stages of post-sale decomposition and decay, across multiple scales and temporalities, between bodies and other non-human actors and contact surfaces.

Polyester is one example of a mobile material in-process: fibres pill, split, break and wear down, while at the same time ‘generating new material arrangements’ with shifting forms and

temporalities (Gabrys 2013: 208). Manufactured, human-made and popularised by fast fashion chains, polyester has lingering qualities that extend well beyond a garment's fashionable lifespan, but that are still poorly analysed in the context of everyday use. Unlike plastic bags or bottled water, where plasticity is upfront, and frequently a site of political contestation (Hawkins 2009), the plasticity of polyester fabrics is rarely acknowledged. Whether a sole object woven together from tiny filaments, or blended with natural fibres, polyesters appear other than a petroleum-based product in the same family as plastic bags or takeaway containers. Polyester is not subject to the same kinds of problematising discourses or campaigns as, for instance, plastic bags. Because of their chameleon-like character, polyester fabrics evade consumers' critical scrutiny. Polyester fibres are, in this regard, a contradictory material – both mundane and malignant.

Like other plastics, polyester's durability promotes accumulations across various material and temporal scales. Polyester's petroleum footings and uniform chemical structures, combined with the long decay time of additives and compounds creates a material and temporal resilience that evades biodegradation (Szostak-Kotowa 2004; Fletcher 2014; Li et al. 2010)¹. The microscopic impacts of polyester are only starting to be known. Scientists have uncovered that chemical additives are not molecularly bound to the polyester chain (Schiers and Long 2003). Additives subsequently leach out from the fibre in numerous and unseen ways. Likewise polyester filaments are now known to be lost through the mechanical removal of pilling as a consequence of laundering (Napper and Thompson 2016). Recent research suggests that a single polyester garment can unleash over 1900 microfibers per wash (Browne et al. 2011), or up to 496,000 microfibers in a standard 6kg load (Napper and Thompson 2016). Daily clothes washing routines in a city the size of Berlin (population 3.5 million) are said to be akin to releasing 540,000 plastic bags into the ocean per day (Siegle 2017). Over a garment's useful lifetime, the weakening of the

¹ A biodegradability comparison of polyester and cotton clothing under laboratory and natural composting settings carried out by Li et al.(2010) found a significant loss of mass for cotton fabrics (between 50-70% over the time recorded). Comparatively, in both environments polyester remained visually in-tact with little to no signs of aging. However, the durability of polyester garments remain unclear and is highly dependent on chemical additives, garment construction, wear and use (Chen and Burns 2006).

polyester filaments leads to more rapid breakoff of pilling due to fibre fatigue – which in turn leads to a greater fibre release while at the same time improving the fabric's topography and surface appearance (Napper and Thompson 2016).

The resulting micro-accumulation of polyester 'plasticisers' are now known to have harmful effects on bodies and environments (Browne et al. 2011; Fries et al. 2013; Napper and Thompson 2016; Wagner et al. 2014). Of concern are the consequences of accumulative leached polyester micro-filaments, health problems among plankton and other small organisms that eat microfibers, concentrations of inorganic and organic pollutants (residual effects from plastic monomers) and possible endocrine disruption in humans (Gabrys et al. 2013; Liboiron 2016; Napper and Thompson 2016). Thus, even when repeatedly used, much loved and cared for (practices that sustainable fashion advocates endorse), clothes made from polyester become a significant source of waste, releasing micro-plastics in ocean waterways globally, where they can be ingested by aquatic life and contaminate aquatic systems.

Further problems arise from polyester clothing in reuse. Champions of clothing reuse and repurpose have sought to intervene in the massive volume of clothing production and consumption by extending the life of clothes, thus minimising waste. Efforts have centred on second-hand economies, recycling, upcycling and DIY cultures of re-crafting and reusing items discarded by others (Gregson and Crewe 2003; Gregson et al. 2007a; Emgin 2012; Brooks 2013, 2015a; Waight 2013; Norris 2012a,b; 2015; Luckman 2015; Binotto and Payne 2017; Fletcher 2016). Turning other people's fashion mistakes from waste into treasures, proponents of sustainable fashion culture have lauded a particular kind of 'wasted' aesthetic that celebrates stitching, darning and patching. For all that beckons in practices of reuse, reselling and upcycling, frequently overlooked are clothes made from polyester. Clothes made from polyester are less capable of repurposing, and contradictorily linger longer within wardrobes and circuits of second-hand clothing due to their longer decay time. They typically have less 'give' in them when

fixing, mending or repurposing and are more difficult to sew without industrial machinery or skill. Less ‘worn in’ in a positive sense, but certainly far from ‘worn out’, polyester dominates charity shops and transnational second-hand clothes trades. While attempts to promote clothing reuse and up-cycling are important interventions in stemming the torrent of clothing production, consumption, divestment and waste, rates of second-hand clothing consumption across the Global North are actually falling (Brooks 2015a; Rodgers 2015). And in any case, such efforts are unlikely alone to reverse the ever-expanding scale of clothing production and consumption.

Polyester thus accumulates as unused and unwanted, but without significant signs of wear. Up to 75 per cent of donated clothes are made up of human-made fibres. When polyester moves beyond the wardrobe it becomes enrolled in new material and temporal economies of disposal, via second-hand clothes networks. Although overall consumption of clothing continues to rise, demand for second-hand clothes in the Global North has waned over the past decade (Rodgers 2015) – leading to more second-hand textile exports (Brooks 2015a; Gregson and Crang 2015). Of used clothes donated globally, approximately two thirds is now commercially exported from the Global North to the Global South (Norris 2015).

Once enrolled in the flow of second-hand clothing exports, such garments – the bulk of which feature human-made fibres – cascade through different countries and markets. Some are traded as reclaimed materials, transforming networks in secondary production (Norris 2012a; 2015). More visible are second-hand clothes traded on flea markets across the Global South, where concern has been raised for the interruption of local, regional and national political economies of clothing production (Brooks 2013, 2015a). There, a mixed story has emerged of vernacular creativities, and pollutant labour in supposed ‘dumping ground’ locations of second-hand clothes (Brooks 2013; 2015a; Gregson and Crang 2015; Norris 2015).

The material recalcitrance of polyester forces us to acknowledge the ways in which the fibre persists long after clothes’ use value is exhausted (Hawkins 2001, 2013; Gabrys 2013; Gabrys et

al. 2013). Once discarded, polyester also moves within reuse, recycling and resource reclamation economies. But there are significant technical challenges to recycling polyester textiles. Due to the diversity of polyester fibres, textile recycling technologies are currently not advanced enough to handle materials *en masse*. Criticisms have been levelled at collection initiatives by fast-fashion brands such as H&M's 'conscious campaign', claiming that returned clothes will instead sit hoarded within factories (Cobbing and Vicaire 2016; Gould 2016). Moreover, it remains technically complex to recycle clothing made of blended natural/human-made fibres. It is likely that a t-shirt that is made up of 99 per cent cotton and 1 per cent polyester would not be saved from landfill (Gould 2015; Weber 2015). Instances of recycling polyester garments and plastic into new fashion items divert human-made materials from landfill (such as Patagonia's fleeces and wetsuits made from partially recycled plastic bottle content). Yet subsequent laundering and care of these recycled polyester garments still leaches micro-plastics into oceans and waterways.

Most polyester clothing still ends up in landfill. There, it is difficult to track decomposition, due to nuances of chemical makeup, and trade-offs in the construction of clothing (better made clothes that last longer also take longer to break down) (Fletcher 2014). Depending on manufacture quality, fabric thickness and material compositions, a polyester shirt is thought to take anywhere from 20-200 years to decompose (Cobbing and Vicaire 2016; Fletcher 2014; Chen and Burns 2006). As polyester garments (or fragments thereof) transpire in landfill a new series of multiple temporalities emerge – albeit at a far slower rate. These temporalities are dependent on an interlocking set of factors: how much waste is added to the landfill and how long it takes for the landfill to become closed, the activity of the microbes and other non-humans working to breakdown landfill waste and the temporal rhythms of microbial life (Reno 2015). Other longer-term temporal scales influence the decomposition of polyester – such as the hydrological cycle, the release of leachates and the interaction of waste with the movement of water on, through and off landfill sites (Reno 2015).

Polyester, then, lingers on – in wardrobes, in circuits of second-hand goods, as micro-plastics in oceans, and ultimately, as slowly decaying detritus, in landfill. Technical, structural and institutional interventions have attempted to grapple with solutions, from collection and recycling schemes, to new products intended to ‘catch’ micro-plastics from clothes during washing (see Patagonia 2017). But all these skirt around the core issue: that driving polyester clothing as waste is what happens to it in and out of use, what meanings are ascribed to it, and how these change when it starts to deteriorate, malfunction or wear. Central is polyester’s materiality, its utility, its laundering, its relationships to cultural norms, its lingering in domestic lives and wardrobes, its discarding. And as we explore below, all these in turn are influenced by polyester’s interactions with human skin, its *feel*. Tracing an embodied geography of polyester, we argue, prompts difficult questions about how materials linger, both in wardrobes and in the waste stream, enabling but also limiting enchantment and reinvention. For although the many political-economic and environmental problems of polyester appear incontestable, cultural questions of everyday use and the visceral feel of fabric, are anything but clear-cut.

Materialising polyester: Towards an embodied geography of plastic clothes

To document its journey from useful fabric to clothing waste, we follow polyester in everyday life, geographically and temporally, considerate of the sensorial ‘unfolding of individuals’ relationships to their clothes’ (Woodward and Fisher 2014: 10). Perceiving clothes as always ‘in-process’ moves beyond understanding clothes as finished objects, and towards the relations they enable: between bodies and materials, objects and practices. Inspired by anthropologist Tim Ingold (2007, 2012), our focus is on everyday, embodied experiences of the materiality and temporality of polyester as an agentic component material. We emphasise the immanent properties of ‘materials and the interweaving of forces that lead them to make up our world’ (Woodward and Fisher 2014: 10). Our position is attentive to the materiality of polyester fabrics,

but especially also how haptic and emotional meanings for synthetics are encoded and vary, with consequences for waste and reuse.

An embodied approach acknowledges polyester's 'properties and capacities, the co-present entanglements of the human and the material, and the ways in which these entanglements, properties and capacities come together in practices' (Gregson et al. 2010: 1067). Like Hawkins (2001, 2006) we seek to move beyond categorical assumptions about materials and waste towards an alternative ethics of waste, foregrounding materials as relational and distributed (Gregson et al. 2010). This requires, in Hawkins' words, understanding 'subjects and objects not as fixed oppositions but products of their relating, as co-constituted with multiple social and material reverberations' (2009: 1). Recognising how materials, materialities and their temporalities intersect with the things we wear (and how we wear them) is, we believe, central to comprehending the possibilities and constraints for rethinking and repurposing clothing waste.

Our focus on the haptic (to touch or grasp, from the Greek *haptikos*) acknowledges the 'multiplicity and the interaction between different internally felt and outwardly orientated senses' (Paterson 2007, 2009: 768; Brown 2016). In that regard, polyester proves to be a troublesome and contradictory material: its plasticity and indestructability at times celebrated, at other times a source of disgust, or in many cases simply concealed from obvious view. Focusing on the embodied geographies of polyester offers a kind of refusal of viewing polyester as if it exists in isolation to sensorial, emotional and evaluative engagements. This alters how the challenges posed by polyester fabrics and clothes might be viewed. They become not just questions of materials and their forms, but of the ways that people relate to materials as an embodied part of everyday routines: what our bodies tell us about how polyester *feels*.

In this paper we unpack the relationship that polyester has with the haptic registers of the body, one that intersects with the material and temporal nature of clothing use, wear and disposal. Inspired by Crang's (2003) approach to 'touchy-feely' methodologies, we are attentive to bodily

sensations and responses to explore the use of touch as a critical means of ‘getting to’ (Straughan 2012: 20) the somatosensory sensations of wearing in and wearing out clothes. We do this by considering how clothes are known via the haptic system. The haptic offers the opportunity to explore how the touch of fabric surfaces operates through the body as a ‘complex sensory apparatus’ (Straughan 2012: 21). Haptic senses are not only sensitive to environmental contact with the skin, but also move beyond the surface to consider somatosensory and kinaesthetic registers of the body felt through muscles, tendons and joints (Straughan 2012; Paterson, 2007, 2009). Our focus on touch is ‘not to deny the occurrence of any other sensual experience’ (Straughan 2012: 21). Indeed, other senses beyond the haptic are involved with the perception of polyester – for instance in the ‘modern look’ of fitness, active and outdoor wear. Rather, we suggest that paying attention to the haptic offers up the opportunity to explore how touch operates as part of the complex bodily senses – one that provokes feelings and emotion to influence the engagements we take with them (Fisher 2013; Straughan 2012).

By following polyester in embodied fashion, and geographically through spaces of use, storage, divestment and circulation, we explore the lingering durability of polyester as the fibre itself takes on new materialities and temporalities – via the bodies it dresses. Polyester moves through categories of usefulness, annoyance, revulsion, neglect and waste in the context of working lives and leisure practices. In such contexts, its feel and encoded cultural meanings vary, eliciting sensorial responses of comfort, discomfort, warmth, sweatiness, pleasure and disgust. As polyester clothes wear, wash and decay, bodily relations with them reconfigure. Materials fall out of objects, or respond to the agency of the user (and indeed, how the user responds to the agency of the material) (Dominguez Rubio 2016; Woodward and Fisher 2014; Ingold 2007). Such processes might unfold silently or unnoticed – we may literally not ‘feel’ them with our bodies (Browne et al. 2011; Liboiron 2016). Other material transformations might rub uncomfortably against the skin. Indeed, materials ‘thwart in unpredictable ways: decaying and breaking down, or

wearing or breaking under force' (Carr and Gibson, 2016: 303)... 'sooner or later their individual physical propensities are sure to come to the fore' (Hitchings 2006: 368). Thus it is only when things break or stop working that we are confronted with the 'thingness' of a thing (Brown 2001; Frow 2001). Only then are we forced to look beyond the object to deal with materials, its material effects and its complexity (Gregson et al. 2010). In this way, the transformative qualities of materials and things can influence practices in ways that 'make them performative' (Gregson et al. 2010: 1067).

Thus, clothes are always 'in-process' – thanks to the material procedures that make them, and ensuing everyday relations between fabric and skin. This paper seeks to respond to such challenges by accounting for the material and temporal durability of polyester, across time and space (Ingold 2007, 2012), as well as our everyday, embodied responses to this mercurial fabric. We are concerned with what polyester does, what meanings it has, how wearers become attuned to the feel of polyester, how it is handled through practices, and what social, cultural and environmental forms happen through and around it.

Exploring the plasticity of polyester: touch, texture and time

Our research followed clothing in the everyday lives and practices of a group of young adults from Sydney, Australia – tracing a materialist cultural geography of clothing as always 'in-process'. Ethnographic fieldwork was conducted between 2013 and 2015 with 23 participants. It involved accompanying young people through two key spaces of clothing consumption. The first interview was located in spaces of clothing purchase, such as shopping malls, markets, or viewing online stores. This initial encounter opened conversations about engagement and attraction to clothes, and revealed tensions between utilitarian and hedonistic shopping experiences. The second encounter focused on storage locations within the home, primarily wardrobes. This space

was chosen for its proximity to clothes that were essentially in-use but also to capture those which had fallen into the liminal or 'dead' spaces of storage.

Throughout, we remained attentive to the passing moments of the haptic – and the ways in which touch was an embedded part of the experience of being with clothes. We sought to indirectly explore 'practical engagements' with clothes to 'unravel rich narratives...in terms of tangible and emotional experiences (Straughan 2012: 22). Haptic experiences of clothing in use were thus anchor points to explore the way that clothes feel at various points in the garment's prosaic biography, from purchase to wear, from wardrobe to washing, and ultimately, as the clothes deteriorate. Focus on the haptic often served as a launch-point for a host of other affectual and emotive experiences of wear, opening up space for understanding 'of how the body acknowledges and negotiates space via visceral, unconscious and cognitive means' (Straughan 2012: 21). As themes concerning polyester use and disposal emerged, our analysis moved between field notes, interview transcripts, and photographs.

As is typical of the life stage of young adulthood, participants were part of diverse lifestyles: eight lived as non-dependent adults in the family home, six lived in share households, and five lived with a partner. The remaining four participants lived in various housing situations, including multi-generational households, house-sitting and living alone. Participants were from diverse ethnic and religious backgrounds. All were independent of their parents and guardians; everyone purchased at least some of their own clothes. However, the responsibility of caring for clothes was mixed. This was largely dependent on living arrangements, and most often the responsibility of the person who maintained daily household routines. We turn now to momentary, lingering and intimate encounters with polyester: how polyester is worn as part of practices and routines, and how it is known haptically in both pleasurable and deceptive ways.

First contact: touch and other bodily negotiations of polyester

In this section, we explore the ways that polyester garments are differently judged. Our ethnography revealed mixed expectations of what polyester should feel like.

Polyester is encoded differently based on the type of clothing worn and the purpose of its use. Its material feel elicits a diversity of sensory and emotional responses depending on the fabric's physical construction and qualities, as well as cultural norms around cleanliness, sweat and smell. Such responses explain how polyester is variously used, enjoyed, washed, rejected and discarded, with implications for its designation as waste, with accompanying geographies and temporalities.

One set of embodied reactions encompassed nonchalance and denial. Polyester is ubiquitous in most basic garments, but unless reading the labels on a garment, modern forms of polyester draw almost no attention to themselves. The qualities of polyester, in all of its mimicking material innovations, hide the plastic properties of the material. Sensed through the body, and mediated by haptic involvement with and appreciation of garment materials, polyester now increasingly appears as the 'new natural' (Küchler 2015: 276; Fisher 2004). Comprised of layered and additive compounds, polyester appeals to the senses as light, flexible and soft, its composition measured by an embodied and sensory perception of comfort (Hebrok and Klepp 2014; Stanes, in press). Among young people we interviewed, the hidden plasticity of polyester was often undetectable.

Equally, the materialities of polyester can be masked by its trademark or brand name. Polar fleece, for instance, conjures images of wool. Lycra is now so normalized as a high-performance fibre for sports and athletic wear that its inorganic origins barely resonate. Accompanying Lycra in that category are a host of additional high-performance textiles – 'elastane', 'microlux', 'Supplex' – whose names evoke both high-tech science and a degree of bodily comfort.

Depending on the choice of processing and blending techniques polyester easily imitates natural fibres. Its plasticity is essential to its success, but has become essentially invisible.

Reflecting on her most appreciated clothes, Lucy (28, share household, employed full-time) questioned the presence of polyester in her wardrobe: 'I can't even think what polyester is, [or] feels like? Do I have anything polyester?'. Concerns about polyester were pushed aside by reflecting on more favourable traits of owning clothes that were, in Lucy's words, 'pretty expensive' and 'well made'. Lucy's denial of polyester is representative of a collapse of 'artificial' and 'natural' as categories for material fabrics (Küchler 2015: 277) – where the properties and performance of materials were shaped by other factors, such as comfort or luxury. Personal perceptions of quality and provenance shroud polyester's plastic origins.

The forswearing of polyester in wardrobes reflects how clothing as fashion is marketed to consumers. Rather than focus on material properties or the quality of construction, attention is instead drawn to aesthetics, trends and fashion (Hebrok and Klepp 2014). During one house visit, Elyse posed a question to Sammy (29, couple household, employed full-time) about the textile origins of the polyester shirt she held in hand. Sammy readily admitted her ignorance to the material properties of polyester, and its mimicking properties:

I don't know about how it gets made. You just look at it and go 'oh, that's pretty' or 'that feels nice. I like it'. You don't look at the process of how it got there. I don't look at tags. I just rely on what it feels like.

Like Lucy, Sammy's naivety to polyester suppressed polyesters origins. To hear of polyester in clothes carries little in the way of provenance or value. But it was perhaps unsurprising that knowledge about textile production was poor, and that participants' abilities to judge fabric quality was limited. While the origins of polyester may be concealed, its mimicking properties can

manifest a type of material ambivalence. These findings concord with research suggesting that consumers are losing the ability or need to distinguish between fabric types and quality (Hebrok and Klepp 2014; Hebrok et al. 2016). But Sammy also reveals that the visual aesthetic of fashion is not the only element important in clothes consumption. So is touch. Interacting with clothes, haptic knowledge of component materials emerges in action through movement with the hands or with the body. Instead, participants spent time getting to know and locate comfort through clothes, even if their cerebral knowledge of materials and fabrication techniques was limited (Stanes in press).

While some were illiterate to the material properties of polyester, a second group of responses was more positive, among those who actively sought out polyester's enduring qualities for purposes of comfort or utility. Filipe (21, family household, full-time student), for instance, preferred polyester over natural fibres:

I look out for the items with a mixture, so a percentage is polyester, a percentage is cotton, a percentage is, well not silk, but some other fabric. Those, I think they are more durable.

A self-described environmentalist, Filipe looks for quality in clothes in the form of durability. Crediting an undergraduate assignment to an awareness of the environmental impacts of cotton, Filipe cites the addition of polyester to natural fibres as a method to prolong the temporalities of clothing use by providing strength and robustness – which in the long term he hopes will help him minimize the number of new t-shirts he needs to purchase:

This shirt is another mix of polyester and cotton. Most shirts are soft like this, and this one is similar except it's much thicker so it's more durable. It can withstand more washes and stuff, it can stretch a lot more and it will probably last a lot longer than this [other cotton shirt] would.

Filipe's literacy of polyester's durability speaks to a material attunement of the fibre based on the positive qualities of polyester: its material strength, stretch and weight. Rather than reading labels Filipe used his hand to decode t-shirts that were 100% cotton versus a cotton-polyester blend. Reflecting on the intimacy of well-worn 'home clothes', Filipe described different types of comfort based on the proximity of polyester to the body:

I don't really look at tags...So this is definitely a synthetic one just by the way it feels... it has a sort of plastic feel compared to cotton and polyester one. These [100 per cent synthetic] tend to be irritating from the skin whereas these [cotton/poly mix] they're very soft and easy on the skin. So I would wear these [cotton/poly mix] to sleep, over these [100 per cent synthetic] since you spend your most time in your clothes when you sleep.

While the majority of Felipe's clothes contained at least some polyester, sensorial and evaluative engagements were employed as a means to safeguard comfort in intimate encounters – such as sleeping. Although the plasticity of 100 per cent polyester was welcomed in its durability, it was avoided during prolonged proximity with the body. The intimacy of polyester was known through touch – based on material knowledge, attunement to the garment's plasticity, and embodied familiarity (Hebrok and Klepp 2014).

Felipe's judgement of polyester's bodily contact was reflected in a third type of response which saw polyester's visceral reactions diverge in contradictory ways dependent on the context of use. Like Felipe, nursing student Bailey (20, family household, full-time student) appreciated the material qualities of her 100% polyester nursing uniform, at work. In uniform, the lightness and durability of the fabric on-the-go and its ease of care between shifts was seen as an advantage to frenetic pace of nursing labour:

I haven't had a problem with human-made fabrics. My nursing uniform is polyester 100% top to toe. All the scrubs are polyester. If you want 100% cotton for some reason you have to request them specially. Yeah so, but I don't have a problem. They're comfy and they're easy to wear to work.

In uniform, the material qualities of polyester scrubs are realised: made to be sturdy enough to endure many wearings, resist different bodily fluids, and stand up to multiple washings. But for fellow registered nurse Raquel (30, couple household, employed full-time), outside of work polyester takes on a different meaning: 'I'd absolutely avoid polyester outside work. I don't like the feel of it. It doesn't flow with the body'. The durability of polyester was deemed suitable for work, but not for everyday wear, where different configurations of comfort, class and materiality prevail.

In other material states, polyester had a different set of meanings. Some of Andrew's (27, sharehouse, employed full-time) most valued items of clothing were related to his health and exercise schedule and the way that the body was felt to achieve fitness in particular fabrics. Enthusiastically explaining the technical aspects of his polyester elastane sports garments alongside embodied, sensual experiences of use in running, Andrew spoke to the ways his clothing:

actually compresses. So when you feel compressed you feel compact and you feel fast... It's just the best. [It feels good] because it's technical... you're emulating the pros and you get to partake in that level of athleticism. You get to play the part... It influences my own perception of my performance... I think I knew what the fabric was, but it was more about the perception of me wearing it. I wanted long sleeves, but I didn't want to melt. And with this, I don't even feel it on. If I wear cotton t-shirt and go for a run it feels like I haven't prepared properly.

Although performance is not a material property of polyester per se, complex haptic perceptions associated with the interaction of a garment and the skin alongside embodied feelings of fitness and performance overrides concerns or even awareness of the plasticity of polyester. Instead, attunement to the lightness, softness and fluidity of material makes it ideal for running.

Such clothes pose profound issues when thinking about cycles of divestment and waste. It is quite unlikely that workwear and sportswear will have a second phase of consumption beyond that of the original user. Placed culturally in the same realm as under-garments, cultural taboos of sweat, dirt and disgust linger in sports garments and nursing uniforms, rendering them unappealing for reuse or upcycling (Douglas 1966; Waitt 2014). Indeed, while Andrew was coaching Elyse on the technical aspect of his sportswear and inviting her to understand them through touch of the fabric, Elyse was assured a number of times that his sports garments were in fact ‘very clean’. There are further unresolved questions about how categories of clothes – such as work or sportswear – become wasted, beyond use and into their afterlife.

A fourth type of visceral response to polyester was more negative, encompassing revulsion, disgust and shame. One form of repulsion was sensed haptically through ‘vintage’ polyester. Welcoming Elyse to touch a long, patterned A-lined skirt scrunched in her hands, Sammy described the visceral rejection of clothing with obvious plasticity:

It doesn’t have a label but you can kind of feel it. It feels slick. Real plasticity. So I wouldn’t wear this that much. At least it has lining, but it doesn’t feel nice. Like, it’s real plasticity. It’s gross. That’s what has turned me off this [skirt]. It’s not a nice fabric. It feels fake. But that’s what vintage stuff is. A lot of *real* vintage clothes feel like this.

Sammy’s material attunement to polyester speaks to an embodied disgust and rejection of the synthetic material, especially the distinct plasticity of 1980s polyester fabric. Second-hand clothes made from polyesters, in particular, were given a wide berth – and suggest one reason for the

decline in second-hand clothes consumption. Several participants felt that unwearable polyester clothes increasingly dominated routes of second-hand clothing.

But sometimes we can lose touch, and fabrics trick us. Turning a blouse inside out to see the care instructions for the garment, Anne (21, family household, full-time student) was suddenly confronted with a label reading that the top was 100% polyester. On discovering the blouse's true content, Anne laughed, holding her hands over her mouth in embarrassment. When asked what it was about polyester that made it so shameful, Anne replied:

I don't know? Our parents always said that cotton is better. Polyester makes you hot. It makes you sweat. I just thought that polyester felt different, like more fake. More like plastic.

When the obvious plasticity of the fibre was unable to be felt, polyester was otherwise often scorned for not being breathable. The plasticity of this form of polyester fabric kept the sweat close to the body, not letting it be released from the fabric. Sally (30, couple household, employed full-time) drew on other bodily senses that detected polyester once a garment had been worn, or where the body had left its mark on it:

I always find with this fabric, the fake stuff, polyester or whatever it is, you only really find out what it is when it starts to smell. This type of fabric really holds your BO [body odour], don't you think?

Cultural norms relating to sweat and affective relations of disgust (Waitt 2014), combine with the lurking co-presence and capacities of synthetic materials. Practices surrounding cleanliness, sweat and smell (Waitt and Stanes 2015) may lead a wearer to repeatedly wash polyester clothes, with unanticipated polluting consequences at a microscopic scale (see above). Here, polyester became

wasteful – not by the wearer encoding the garment as abject or disorderly (Douglas 1966), but rather in the shedding of micro-plastic fibres from repeat washings deemed necessary to counteract the component material’s abilities to elicit sweat and retain bodily smells. Polyester thus becomes waste incrementally, and microscopically, even while clothes made from it are still in use.

Rather than eliciting uniform responses, perceptions of polyester provoked distinct and diverse actions upon the material. Associations with sweat, odour and plastic have made the very idea of wearing polyester taboo, and offers clues as to why some were so quick to denounce its presence in their wardrobes. But as we have seen from Felipe’s preferences, revulsion was not the ubiquitous response. In many instances polyester was not felt consistently across bodies, with visceral, sensorial and emotive responses shifting with context, use and perception. Once enrolled in everyday practices consumers appraise and differentiate polyester in divergent ways.

Lingering in and out of wardrobes

Our own ethnographic research, together with foundational work from divestment scholars such as Nicky Gregson (2007, and with colleagues in Gregson et al. 2007b), Kevin Hetherington (2004), and David Evans (2012b, 2014) suggests that there are multiple conduits for ‘moving things along’ in the redistribution and recirculation of surplus things. They include hand-me-downs or clothes swaps, clothing charity bins or other donation networks, selling via second-hand markets (such as eBay or garage sales) and thrift stores, or by moving them towards landfill or recycling (Gregson and Crang 2015). Here, we focus on polyester clothes that accumulate as ‘matter out of place’, and that have fallen outside the ‘gap of accommodation’ of wardrobes (Gregson 2007: 165). We contend that there is a ‘performative reading’ of polyester to be had in ‘economies of disposal’ (Gregson et al. 2010: 1065). In this section we focus on the ‘multiple

shadow realities of disposability' (Hawkins 2013: 62) in the material and temporal lingering of polyester, noting its shifting properties as it transforms (sometimes covertly) beyond use value and towards second-hand economies and landfill.

Notwithstanding their intended durability, synthetics do in fact wear, and decay – albeit at a far slower rate than organic fabrics – but in ways that co-shape ongoing relations of care, use and eventual ridding². First, a wearer might notice small signs of degradation. Bailey explained how a blouse, undamaged and in good quality, fell out of regular use: 'it just feels like, not smooth. Like, you can feel the bumpiness on your skin and I feel like that's not what you're meant to wear on your skin'.

The surface of the fabric might become thinner or rougher. The subtle texture that is designed into the polyester textile might have worn slightly. Although unnoticeable to an onlooker, the wearer is attuned to its shifting material state and becomes more and more aware of decaying, discomforting synthetic surfaces against the skin. This new surface is idiosyncratic. It is produced by the presence of the wearer's body – the push of the fabric and the friction between mobile body parts, by other non-human actors and contact surfaces: backpacks rubbing, sitting against a chair, washing machines or dryers. Beyond standards of garment construction, discomforting surfaces that emerge from wear and tear often render synthetic clothes beyond further use, marking the point of divestment or ridding. All of this is refracted through touch. Anyone familiar with second-hand or vintage clothing will recognise this: it is the reason charity stores are clogged with garments made from synthetic materials that are to all purposes still useful – without stains, tears, or holes – but unlikely ever to be repurchased or repurposed, because they are slightly scratchy, pilled, or unevenly degraded in ways that, unlike organic fibres, add no

² The durability of clothes is also dependent on the quality of garment construction. The low cost and rapid speed of fast fashion garments (many of which are made with polyester) mean that they are often made to fall apart. At the time of writing, for instance, one budget Australian retailer, Best & Less, was advertising a '100-day guarantee' on its clothes – perversely turning the short intended life of the garment into a marketing opportunity. Despite the durability of polyester, the full possible use value of a garment will be lost in poor quality manufacture.

obvious 'worn in' aesthetic. This discomfort was born out in Sammy's experience. A former vintage enthusiast, Sammy came to lament the vintage clothes that had become trapped in her wardrobe:

a lot of them are made of synthetics so they couldn't breathe, you can't breathe and you get really sweaty and hot. It was just not comfortable. There was always something that was itchy or something like that. Most of the vintage stuff that I do have I've stopped wearing because of the fabric.

Indeed, polyester or polyester-blend clothing was the most common type of clothing to accumulate in wardrobes³. Fabrics became trapped in a liminal storage space. Slowly decaying polyester clothes lingered on in people's homes and wardrobes, drawing out their spatio-temporalities as unused objects. Wardrobes in effect became 'coffins' for clothes (cf. Evans 2012b, 2014; Hetherington 2004). People were reluctant to dispose of such clothes due to their ongoing persistence and object permanence – having neither fallen apart or worn out. Stretching her body to reach down into a tub positioned awkwardly in the bottom corner of her built-in wardrobe, Anne groaned as she retrieved a crumpled pair of polyester shorts. Among the pile were other unused polyester garments: singlets, shirts, blouses and skirts, still in good condition but no longer preferable for wear. Anne recalled an attempt to move the pants out of her wardrobe:

and then my mum also tells me like "why would you throw that away" or "why are you giving it away when it's still like, in good condition and you can still wear it". But there are a lot of things that I don't really wear, like this skirt. I don't know? Or these shirts. I feel like they have potential to be worn again.

³ Recent research suggests that approximately 30% of clothes in UK wardrobes are not worn (WRAP 2014).

Many such items, clogging up wardrobes even though still technically ‘useful’, were handed-down or gifted clothes. Of the hand-me-down clothes shown to Elyse, a large number were polyester, or polyester blends. Held onto for emotional value, polyester clothes that were not worn enough for disposal sat in wardrobes. Clutching at a polyester polo shirt, Filipe reflected, ‘I feel like there’s a lot of useless clothes that I don’t use...there’s a lot of stuff on the right, like hand-me-downs. I don’t really touch that stuff’. Hand-me-down clothing has emerged as a vernacular circular economy within which clothes move through networks of family and friends (Gregson et al. 2007b). Here, what attention to polyester uncovered were the ways in which hand-me-downs become a problematic burden on wearers and wardrobes – weighed down by familial and peer relationships. Recipients of hand-me-downs felt unable to divest to other channels because of emotional attachment to clothes gifted to them, but that they were unwilling to wear. Not all clothing in this category was made from polyester, but again, polyester clothes were most commonly present – their materiality evoking visceral responses that prevented regular use, but the familial relationships and patterns of generosity informing them encouraging people to retain the items rather than donate or divest them. The wardrobe, then, became spatially a kind of liminal zone, storing regularly worn items as well as those in purgatory – neither fully useful, nor fully waste. This liminal zone is where polyester most commonly lingers in our lives.

As a generation that has grown up with kerbside recycling for almost all household objects, some participants expressed a sense of anxiety about how best to get rid of items that were deemed to too worn for reuse but not completely worn out. Thus, some polyester clothes lingered out of confusion. Underpinning this was a sense of stewardship for the clothes – that they will in fact be worn on rather than risk another period of waste in non-use (Lane and Watson 2012). Lara (28, share household, full-time student, employed part-time) queried where garments would go if

they had already outworn a realistic destiny within second-hand economies. With a bright coral polyester blazer in hand, Lara asked:

I wouldn't even know how to get rid of it. You couldn't pass it onto a friend or an op-shop. It's got marks and stains all over it – especially where the deodorant has stained the clothes under the arms. That could even be from whoever wore [it] before me [laughs]. What do you do with stuff like that? It can't just go in the bin.

While some participants displayed a generosity towards reusing and caring for clothes, it appeared that this generosity defaulted to particular types of materials, especially cotton, silk or wool. Polyester clothes, by contrast, lingered – and often ended up being pushed to the back of the cupboard and forgotten about. The unresolved question is whether storing clothes in this way prolongs its life, reserving use value for future redeployment, or whether it creates instead a certain kind of proximate waste, never entirely jettisoned from the home, but waste nonetheless. Such examples showed us how divesting and passing on unwanted garments becomes emotionally fraught, because of polyester's on-going material integrity. Paying attention to the material qualities of the clothes that are ridded (or not), reveals the capacity of polyester to disrupt and interfere with the temporal and haptic logic of ridding. Polyester's feel and durability, its microscopic mutations and its capacities to elicit contradictory responses of disgust, neglect and guilt, meant that clothing seldom became waste in predictable ways.

Conclusion

Embarking on tracing polyester fabrics geographically, we anticipated that a distinctive contribution of this work might be to review discourses that have grown up around human-made fibres, from manufacture and use to patterns and processes of divestment. Polyester is

culturally encoded in complex ways that shift with use and context (Schneider 1994; Hawkins 2009, 2013; Küchler 2015). But after following polyester, assembled into clothes that are always ‘in-process’, from shops to bodies, to wardrobes and beyond, a more complex picture emerged: of haptic relations and visceral reactions, of lingering presences, deceptions and invisible polymer unleashings. Drawn into this story are accompanying threads and concerns – ever-increasing production and consumption (Norris 2015), industrial design and branding of clothes, cultural norms of sweat and smell (Waite, 2014; Waite and Stanes 2015), affective relations of disgust (Hebrok and Klepp 2014), and the obligations of familial handing-down (Gregson et al. 2007b). Alongside these are a host of human and nonhuman entities that together shape the biographies of less loved, but long-lasting, clothes – microbes, polymers, wardrobes, workplaces, sweaty bodies – revealing polyester’s more complicated ends (Browne et al. 2011; Napper and Thompson 2016; Brooks 2015a, b; Norris 2015; Waite 2014). Insights from textile science, marine biology, design and the social sciences illustrate how polyester connects with designers and retailers, wardrobes, the wearers of clothes, market traders and non-human environments and species in a different kind of public. In the case of polyester, the vital materialism of plastic is arranged and reconfigured as waste in different, and altogether uneasy, contradictory configurations.

In this paper, we focused on the much less heralded stock of unwanted clothes, and the materials they are made from – specifically polyester, the ‘stuff’ of clothing waste (Gregson and Crang, 2010: 1026). Polyester clothes were derided by many as plasticity and discomforting. Likewise they were valued by others as workwear or active sportswear through their material durability. Their capacities to endure, but also elicit sweat, combined with cultural norms of cleanliness and bodily smell, provoke altered laundering practices. We now know that in the process of subsequent washings, polyester is made microscopically mobile, moving from the ‘category of inert... to a hazard potentially unbound’ (Gregson et al. 2010: 1077). Polymers, monomer additives become

part of 'bodies, ecosystems, consumer products, and landscapes' at the invisible microscale (Liboiron 2016: 96). Meanwhile other polyester clothes linger on in purgatory, as hand-me-down items unwilling to be ridded, or as proximate waste, accumulating in the murkier reaches of wardrobes. Polyester's after-lives are both intimate, and infinitely dispersed.

We have sought to show that, at the intersection of clothes as objects and fashion, as useful garments and as waste, the temporal durabilities of materials and everyday embodied encounters with the materiality of clothing requires additional scrutiny. For clothes waste is more than either a cultural or structural problem. To echo Waitt and Phillips' (2016: 362) recent work on domestic food waste, the challenges of clothing waste are 'embedded in and enacted through practical relations among people and the material world'. They argue that a key problem with treating waste simply as:

culturally circumscribed is that it allows us to avoid the materiality of things and their relations...for things categorised as waste do not merely symbolise social order and spatial ordering; rather the force and matter of things participate in their creating, recreating, placement and ridding (Waitt and Phillips 2016: 363; see also Hawkins 2006, 2013).

There are implications for how a politics and ethics of responsibility for clothing waste unfurls. Polyester compels consideration of 'differentiations in and possibilities of responsibility' (Phillips 2017: 41). Second-hand, vintage, craft and upcycling cultures, for instance, challenge us to rethink what clothing waste might mean, but focus first on those discarded items that hold the best potential to be repurposed or refashioned. Such items constitute a tiny fraction of the volume of clothing items made, sold, worn and discarded annually. The risk is, then, that in the rush to embrace a 'worn-in' or DIY aesthetic in clothing, we overlook the rest – the vast bulk of

less-than-ideal clothing, poorly made, unflattering, uncomfortable, hard to mend or alter clothes containing human-made materials that fail to break down, and that dominate circuits of discarded items.

In a world now brimming with materials that signify their technical, sensual or pleasurable aspects (O'Connor 2011; Hebrok and Klepp 2014; Hebrok et al. 2016) as wearers we are rarely encouraged to consider the properties, social or environmental impacts of the material objects – and effects – that surround us (Küchler 2015). Understanding clothes-in-process, assembled from constituent materials with which our visceral relations unfold and shift with time, wear and decay, is necessary when considering social orders and how we inhabit them. To borrow again from Waitt and Phillips (2016: 362) 'waste is a result of an object's inability to fit into a cultural system, a disordering often accompanied by negative valuations, and a treatment of excess'. The case of polyester both confirms this (as in clothes discarded because of discomfort or fear or sweat and smell) – and confounds such understandings (as in frequently used polyester clothes that leach wastes into waterways through repeated washing). Reconfiguring concepts of waste in clothes consumption demands a rethinking of the material and temporal composition of commodities: how materials feel when we wear them, how they change through various transformative states, how redundant items become 'worn out' – and where their material memories live on as either harmful microscopic presences in oceans and landfill, or in wardrobes, as mundane piles of still wearable, but unworn, garments provoking mixed feelings of neglect and guilt in their owners. Our focus on polyester sheds much needed light on our relationship, as wearers, to the materiality and temporal endurance of human-made clothes, as well as identifying seldom discussed elements of our visceral relationship to polyester during the life of objects that are implicated in their disposal (cf. Hawkins 2006, 2009; Gregson and Crang 2010; Gregson et al. 2010).

The kind of embodied and sensual approach taken here – with its dual focus on material politics – opens up space to connect more deeply with the materiality of resources, and indeed the haptic qualities of such things, rather than the objects themselves. The wider economic realities of clothes production appear to have overshadowed individual experience and responsibility, ignoring place specific context and how the material properties of second-hand clothes interact with different spatialities and actors in the Global South. At the time of writing, little research had paid attention to clothes – including those made of polyester – that live on in second-hand economies, and which become entangled in new waves of fashion and trend without wear or decay. Tracing clothes into various economies of disposal requires greater recognition of the ways that second-hand clothes are perceived, touched and understood across different locations in Global Production Networks. At another scale, the novel material make-up and extreme longevity of polyester is now known to circulate into ‘new realms with chances for potentially unknown modes of relation’ (Liberion 2016: 103). Understanding the embodied aspects of clothing use and disposal as part of the challenges of micro-plastics – for example – changes how a material politics might be confronted. How, for instance, might the problem of micro-plastics sit against social and cultural ideas of cleanliness and dirt? The concept of waste itself is, of course, ever-slippery and unstable (Evans 2012b, 2014). This is exemplified, we believe, in polyesters: as materials that perform and endure; that feel comfortable or awful; that deceive, and linger, without easy resolution.

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