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Regenerative Abundance: Fast and Sustainable Apparel Production in Toronto

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REGENERATIVE ABUNDANCE: FAST AND SUSTAINABLE APPAREL PRODUCTION
IN TORONTO

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B.A. Hon. The University of Guelph, Guelph Ontario, Studio Art, 2008

The Major Research Paper is submitted
in partial fulfillment of the requirements for the degree of
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Ryerson University
Toronto, Ontario, Canada

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Abstract

Regenerative Abundance: Fast and Sustainable Apparel Production in Toronto

Sarah Portway, Master of Arts Fashion, Ryerson University, 2012

Keywords: Apparel, cradle-to-cradle, fast-fashion, manufacturing, sustainability, Toronto, Zara

Fast fashion consumers demand rapidly changing, trend-based product lines at low cost. As a result, independent designers struggle to compete and this model of production has far-reaching negative environmental and social impacts. This exploratory qualitative analysis suggests best practices to revitalize Toronto's apparel manufacturing sector by catering to new demands with a blended approach rooted in Zara's fast fashion supply chain model, and McDonough and Braungart's (2002) vision of *Cradle to Cradle* sustainability. Using a semi-structured interview and online short answer questionnaires, participants from the Toronto apparel design and manufacturing industry were asked what they thought about these competing objectives. Four themes emerged: (1) the need to instil sustainability awareness in consumers and producers; (2) the need to manufacture locally; (3) the importance of convenience and incentives offered for sustainable, local production; and (4) the pace of apparel production must discard the two-season model in favour of more rapidly changing product assortments.

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Introduction

Global fashion markets and consumption patterns have shifted in recent years towards what is commonly referred to as ‘fast fashion.’ According to Sull and Turconi, this term describes “. . . the retail strategy of adapting merchandise assortments to current and emerging trends as quickly and effectively as possible” (2008, p. 5). This shift has created a new mandate among designers to quickly and inexpensively respond to consumer demands in just a few weeks, compared with traditional apparel manufacturing timelines that deliver products in 6-12 months (2008, p. 5). These quickly produced goods are part of rapidly changing product lines, and are manufactured with lowered quality expectations, with any particular garment designed to be worn approximately 10 times (Ghemawat, & Nueno, 2006, pp. 12-13). This means that instead of buying one high-quality fashion staple item such as a classic pair of black dress pants, consumers are encouraged to buy multiple ‘fashion’ pairs.

The Problem of Textile Waste

Although fast fashion consumers “. . . are now questioning the link between low fashion prices and unethical working conditions in factories overseas. . . there still appears to be little awareness of the impact of the disposition of high volumes of textile waste . . .” (Morgan & Birtwistle, 2009, p. 192). The relationship between globally changing apparel-shopping practices and increased waste has been illustrated by the Environment Select Committee - between 2003 and 2008, the proportion of textile waste collected in the United Kingdom increased from 7 percent to 30 percent of the total discarded weight (Morgan & Birtwistle, 2009, p. 191). This increase has been distinctly linked to the influx of low-quality and low-cost clothing flooding the market (Morgan & Birtwistle, 2009, p. 191). Although no similar study has been done in Canada, these results are still worthy of note as the prevalence of fast fashion has changed the Canadian

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retail arena in similar ways (Industry Canada, 2012). Textile waste in general poses health risks as it contains dyes and other chemical residues from textile finishing processes, and when these contaminants are buried in a landfill they can seep into groundwater and/or generate gas and odour (Gam, 2007, p. 25). Canada sends “. . . 2 million tonnes of textile waste to landfills each year . . .” and this average weight is steadily increasing (Eco Canada Textile Recycling, 2011). Although “textile reclamation businesses recycle both natural and man-made fibres, and the majority of all textiles thrown away are recyclable . . .” However, the inexpensive synthetic and blended-fibre fabrics favoured by the fast fashion industry cannot be recycled and do not biodegrade easily (Morgan & Birtwistle, 2009, pp. 191-192).

The onus currently rests on consumers to make sustainable purchase and disposal choices. This is problematic because making sustainable apparel choices is a complex and multi-faceted issue; these decisions require an in-depth understanding of the fashion system, which is of little interest to many consumers, in addition to the already challenging subjective shopping choices made by individuals such as finding the right style, fit or expressive qualities (Morgan & Birtwistle, 2009, p. 192). Fashion theorist Elizabeth Wilson has suggested that fashion is more than a mere emulation of repeated changes and that individuals use clothing as a pleasurable, non-verbal communication of their unique identities (1985, pp. 47-66). Consumers should not be forced make these subjective, expressive and sometimes financially motivated decisions based on environmental or social stewardship, which are objective considerations that unnecessarily complicate the shopping process. In fact, Dickson has discovered that “consumers [feel they] have insufficient knowledge of problems in the apparel industry . . .,” and these decisions are therefore typically made without environmental or ethical consideration (2000, pp. 27-28). Dickson adds that choosing to buy *only* products that reflect ethical or environmentally

responsible attributes limits consumer choice (and often comes with an inflated price tag), making responsible environmental or social purchasing motivations a burden on the shopper (2000, p. 28). Objective considerations are simply not as important to consumers as more subjective “. . . product attributes, including size, color, style, brand, and price, and consumer considerations of need, mood, liking, and appropriateness (e.g., ‘right for her’)” (Rudell, 2006, pp. 290-291). Environmentalism and ethics should therefore instead “. . . feature [themselves] as added selling points, rather than try to change consumers’ priorities” (Rudell, 2006, p. 293). Given this, the onus of environmental and ethical stewardship *should not* be on consumers, their priorities will not change. Instead, this responsibility rests with designers.

Designer Accountability and Competitive Advantage

Designers are accountable for the environmental impact of products they create “. . . because decisions made early in the process, such as materials selection, significantly impact the [environmental and economic] cost of a product’s life cycle. . .” (Armstrong & LeHew, 2011, p. 31; Gam, 2007, p. 2; Thiry, 2011). Designers can also determine how much raw material goes into a finished product, and they can control how much is wasted through careful drafting of plans, patterns or molds. When designers first conceive of and sketch a product, they become implicitly involved in the manufacturing processes that produce their design (Armstrong & LeHew, 2011; Gam, 2007; Thiry, 2011). Designers must be encouraged to recognize sustainability as a competitive advantage; in fact, Carter and Rogers have found that firms which “. . . strategically undertake [Sustainable Supply Chain Management] will achieve higher economic performance. . .” than companies who neglect these concerns (2008, p. 371). “In addition, win-win situations will increasingly arise as energy prices inevitably increase and as greater transparency allows stakeholders to see further along an organization’s supply chain”

(Carter & Rogers, 2008, p. 370). Aside from positive consumer relations, when sustainability is adopted early, government regulation can be modelled after a company's existing manufacturing practices, mitigating the need for expensive changes in production methods after legislation changes (Carter & Rogers, 2008, p. 370). Manufacturers have also reported "reduced costs, shorter lead times, and better product quality associated with the implementation of [International Standards Organization] 14000 standards, which provide a framework for environmental management systems. . ." (Carter & Rogers, 2008, p. 370). The competitive advantages of sustainability are difficult to ignore, but there has yet to be a sustainable apparel production paradigm adopted in a widespread capacity.

A Model for Sustainable Apparel: The Cradle to Cradle Approach

Co-authors of *Cradle to Cradle: Remaking the Way we Make Things* (2002), William McDonough and Dr. Michael Braungart have dedicated their professional careers to creating a sustainable design and production model. They have developed the cradle-to-cradle (C2C) approach that suggests industry and human systems should emulate those of nature (pp. 78-79). Most importantly, they have based their environmental approach on the reality that ". . . [Earth's] system is closed, and its basic elements are vulnerable and finite. Whatever is naturally here is all we have. Whatever humans make does not go 'away'" (p. 103). In the C2C system, waste becomes food for other processes (p. 72); if fast fashion textile waste became food for other processes, current modes of over-consumption and disposability would not need to change. Trend-based purchasing can continue (thus feeding the new expressive, low-cost-and-low-quality needs of consumers), but sustainable design practices (as defined throughout this research) change the ability of these rapidly replaced goods to be recycled or disposed of.

Revolutionizing apparel production under this system will not be easy or fast, but it will address the problems of waste, consumer appeal and profitability. After all, “it is not possible (nor would it be necessarily desirable) to simply sweep away long-established methods of working, designing, and decision-making. . .” (p. 165). A new design method must respond to immediate deadlines and consumer demands while also taking sustainability measures into consideration in a way that makes the most sense for the business (p. 165). This sustainable design assignment is emergent; the innovation needed will take time and should be considered a long journey rather than an immediate destination (Armstrong & LeHew, 2011, p. 31; Fletcher, 2008; Thorpe, 2007).

Toronto’s Opportunity for Revitalization

Canada’s bustling city of Toronto is in a unique position to address sustainability. According to Industry Canada, innovation, adaptation, and growth are heavily supported as the future of southern Ontario’s prosperity (2011a, para. 4). As part of Canada’s Economic Action Plan, FedDev Ontario was created to support southern Ontario businesses and their surrounding communities. This organization has launched specific targeted initiatives such as the Southern Ontario Advantage which provides opportunities for “. . . partnerships and investments in skills and training; innovation; research and development; and increased productivity” (2011a, para. 6).

To Torontonians, this means an increase in funding to intellectual and creative sectors

. . . as low-skilled factory work [is] sent offshore where it can be done more cheaply, employment in the manufacturing sector has plunged to less than 12 per cent of the total job market from more than 19 per cent in the 1980s. . . In other words, the well-paying jobs of the future will be those that can’t easily be sent elsewhere . . . those who work with their heads as much as their hands enjoy the greatest job security. For instance, over the past three decades Canadians employed in what Milway calls “creative-oriented” jobs, such as lawyers, accountants, engineers and higher-end contractors, have never, as a group, experienced an unemployment rate greater than four per cent. The blue collar jobless rate has been consistently higher. During the recession of the 1990s, unemployment among that group hit 16 per cent (Kirby, 2011, para. 6-7).

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As these industries expand, more designers are needed to fill creative roles and are charged with the duty of Canadian innovation- a necessity if the nation is going to stay globally competitive. This also impacts the physical production of goods and despite recent downward trends in Toronto's manufacturing sector, changes *could* be on the horizon.

In 2006, China emerged as one of the top six suppliers of apparel to Canada (Campaniaris, Hayes, Jeffrey, & Murray, 2010, p. 14). More recently, however, China has lost its low-wage status and production had shifted to countries such as India, Vietnam and Bangladesh (Mead, 2011, p. 559). In fact, China's total clothing exports to Canada have already flat-lined after their steady increase since the beginning of the millennium (see Appendix A, Figure 1). As the fast fashion industry continues to grow in light of increased apparel consumption by a trend-hungry populous, rising demands will need to be filled elsewhere. With the unemployment rate of Toronto's manufacturing sector at 16 percent (Kirby, 2011, para. 7), there is tremendous room for growth and a revitalization in that industry, if incentives are put in place to foster Canadian manufacturing in addition to those offered for innovation.

The westward displacement of local apparel businesses.

As a Toronto shopper since the 1990s, the researcher has observed a displacement of local apparel businesses. Queen Street West near Spadina Avenue (the epicentre of Toronto's 'Fashion District') was once a hub of independent record stores, artisanal street markets, apparel businesses and other localized economic activity. Today, multilevel and multinational fast fashion meccas such as H&M and Zara dominate the strip. Smaller apparel production facilities used to fill the streets on lunch breaks with hungry seamstresses, cutters, and pattern drafters and many of these facilities have now been turned into expensive condos with prestigious addresses making the term 'Fashion District' an inside joke to Toronto residents. While there are a few

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notable exceptions along this strip (such as Pam Chorley's Fashion Crimes, a successful independent destination for ladies' formal wear in the area), the price of rent continues to increase and big businesses will continue to move in. As it stands, a concentration of local designers has moved west of Bathurst Street, even further away from popular tourist destinations such as the CN Tower and Dundas Square (which is also dominated by two multilevel fast fashion stores, H&M and Forever 21). Tourist dollars are vital to independent businesses but are being siphoned as shoppers spend their money in these more visible locations. Competing with fast fashion retailers is a challenge for smaller boutiques, but by catering to the changing demands of consumers, Toronto has an opportunity to revitalize the currently flailing apparel industry. While attending to new needs will mean different things to different businesses, this research looks at agile production, being consistently on-trend and inexpensive (a fast fashion tactic), and creating environmental and ethical core values to entice the eco-minded shopper. In the end, however, consumer demand for a less expensive product must be acknowledged, and this is made clear by the steady decline of clothing prices in the Canadian retail market (see Appendix A, Figure 2).

Zara: Success by Speed, Flexibility, Proximity, and Price

Zara's tremendous success forms the fast fashion model for this research. Their choice is deliberate: "Zara is one of the world's most successful fashion retailers. . ." (Lopez & Fan, 2009, p. 279). Zara operates 5,044 stores in 77 countries, and produces more than 2,527 million euros in sales yearly, according to the most recently available reports (Inditex, 2011, p. 3). Zara was established in 1975 and is the flagship of the world's second largest (and rapidly growing) clothing retailer, Industria del Diseño Textil (Inditex) (Lopez & Fan, 2009, p. 280). Zara's incredible success is a result of revolutionary supply chain management evident in unique agility

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and speed due to physical proximity to consumers and unparalleled sensitivity to rapidly shifting demands. Counteracting the fashion industry's search for the lowest possible price on labour, Zara has instead opted to vertically integrate production by keeping most trend-based items manufactured closer to the sites of sale, such as Spain and Italy, while only contracting non-seasonal merchandise to low-wage countries (Lopez & Fan, 2009, p. 292). Despite the higher costs Zara incurs by employing local garment workers, Zara still manages to offer a low, competitive fast fashion price to their consumers. This is achieved by

. . . lower transportation costs, faster supply times, greater proximity to centres of fashion and design, and a greater ability to respond quickly to changing market demand. These are qualities that some high wage countries have successfully exploited in defending their domestic markets against imports and, in the case of Italy, maintaining a positive trade balance in apparel (Doeringer & Crean, 2006, p. 354).

This research will demonstrate that these labour advantages are also consistent with a more sustainable model of production that could be valuable to smaller Toronto facilities.

Moving from Problems to Solutions – A Three-Pillar Approach

This research is intended to explore best practices that could be useful to apparel designers by creating a model based on three intersecting pillars (see Figure 1):

1. Designing for sustainability as defined by C2C's 5 steps of eco-effectiveness.
2. Fast fashion supply chain management practices as modelled by Zara.
3. Local manufacturing best practices and opportunities in Toronto, Canada.

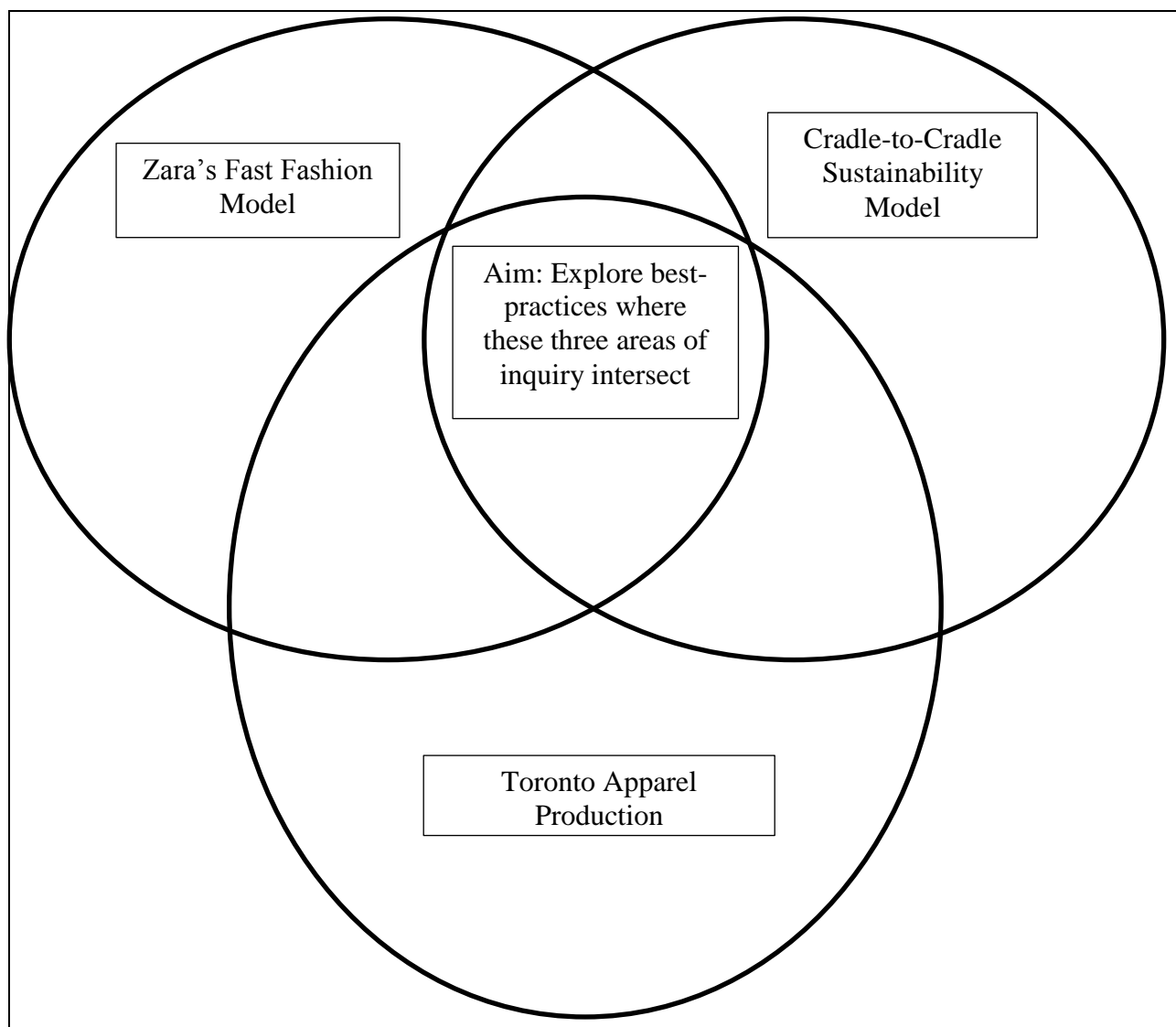
The intent of this study is to discover how Toronto designers envision improvement, and to set fashion industry goals that will end the wide-scale environmental and social degradation that has been acknowledged by previous studies (Dickson, Loker & Eckman, 2009; Drennan, 2011; Environment Canada, 2011; Fletcher, 2008; Hethorn & Ulasewicz, 2008; McDonough &

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Braungart, 2002). Despite the focus on long-term production goals, this paper sets an important benchmark of success in developing a more sustainable fashion industry that meets contemporary fast fashion demands. Areas of further inquiry that would bring this sustainable design journey from potentiality (as explored here) into actuality are also discussed.

Figure 1:

Relationship of Areas of Inquiry and Best Practices



Review of Literature

The following review of literature will clarify the terms and theoretical framework used throughout this paper and selectively discuss (1) Zara's model of fast fashion; (2) the cradle-to-cradle (C2C) approach to sustainability; and (3) the conditions in Toronto that make a blended (fast and sustainable) approach a viable option for the future of its apparel industry. These areas of inquiry have tremendous breadth and depth, and also have far reaching impacts. As such, and given the intended scope of this research, they cannot be fully detailed here. A list of guiding research questions follows the literature review.

Theoretical Framework

Sustainable fashion design and production processes have been analyzed in relation to two existing paradigms: fast fashion as modelled by Zara, and McDonough and Braungart's C2C vision of sustainability. The proliferation of fast fashion consumer purchasing in Toronto has suggested the need to adapt localized manufacturing practices to conform to this model in order to stay competitive. By applying these two seemingly oppositional motives, possible solutions to fast fashion's domination of the Toronto fashion market and its inherent wastefulness will be addressed (see Figure 1). Best practices (also known as benchmarking) in this context has been adapted from Susan E. Williams (2008): "in essence, benchmarking is about adapting what you learn from the best and modifying these practices to your circumstances." The best practices suggested here are designed to be adopted gradually over time as they become applicable and accessible to both new ventures and existing businesses as they journey towards eco-effective fast fashion design.

Fast Fashion

Fast fashion practices have been championed by large corporations such as Inditex (of

which Zara is an extremely profitable subsidiary) and H&M (Sweden's Hennes and Mauritz).

According to Sull and Turconi:

Fast fashion describes the retail strategy of adapting merchandise assortments to current and emerging trends as quickly and effectively as possible. Fast fashion retailers have replaced the traditional designer-push model – in which a designer dictates what is “in” – with an opportunity pull approach, in which retailers respond to shifts in the market within just a few weeks, versus an industry average of six months (2008, p. 5).

By obtaining unprecedented speed by tightening design to retail phases, “samples can be produced in a day, [and] small orders for market testing are produced in less than a week. . .

Those that attract consumer demand are reordered on a larger scale and again are quickly market-tested” (see Appendix B, Figure 1; Doeringer & Crean, 2006, p. 371). Garments are conceptualized, manufactured, and shipped *during the selling season* over a period of four to five weeks for new styles and stock is modified or replenished in just two weeks (Ghemawat & Nueno, 2006, p. 9). By rapidly turning over product offerings, fast fashion customers see a fresh store every time they visit (Ghemawat & Nueno, 2006, p. 13), thereby mimicking rapidly changing trends. These items are not bought for prolonged wear and the price must reflect this. The garments are therefore representative of “. . . reasonable but not excessive physical quality. . .;” they are meant to be worn about ten times and are thus considered ‘disposable fashion’ (Ghemawat & Nueno, 2006, p. 13; Morgan & Birtwistle, 2009, p. 191). When items fall apart after just a few wears, consumers simply discard them and buy something more fashionable and new, creating a huge amount of waste as the industry builds obsolescence into their products (McDonough & Braungart, 2002, p. 98).

The history of just-in-time-manufacturing.

Fast fashion's predecessor was known as ‘just-in-time manufacturing.’ This term was coined, according to Doeringer and Crean (2006), during hard economic times in New York

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between 1992 and 1998 as large retailers began to adopt a new lean and flexible system of production. This practice offered financial incentives for the rapid production of goods and accurate order fills, which necessitated new logistical systems, and became normative through business partnerships in which large retailers (such as VF and Sarah Lee) encouraged their preferred suppliers to adopt new information technologies. This enabled communication at seven times the rate previously experienced, and improved flexibility in production practices. The result was an increase in delivery frequency, which allowed these companies to keep less stock in their retail locations by replenishing it more frequently according to consumer demand (Doeringer & Crean, 2006, p. 362-370). In the apparel industry, this was achieved by creating products closer to their markets of sale. The disadvantage of higher local labour costs was offset by limiting low-cost but slow overseas production that was delivered at the start of the selling season in *anticipation* of demand rather than as a reflection of *actual* consumption patterns (Doeringer & Crean, 2006, p. 362-370). By the mid-1990s, businesses adopting these practices noted escalated profits compared to their slower, less agile competitors, and they also experienced faster sales growth. Higher production costs were offset by lower transportation costs, leaner inventories and fewer markdowns, resulting in higher net profits (Doeringer & Crean, 2006, p. 362-370). These successes were short-lived, however, as large domestic apparel manufacturers were slow to respond and Mexican/Caribbean apparel manufacturers could emulate the rapid time to market while also offering the advantages of lower labour costs compared with domestic American workers (Doeringer & Crean, 2006, p. 362-370).

The contemporary demand for fast fashion.

Morgan and Birtwistle's "... projections suggest that fast fashion will remain buoyant for the foreseeable future, thanks to its attraction to the young and fashion-hungry, as well as its

practical appeal to the lower socioeconomic groups . . .” (2009, pp. 190-191). Fast-fashion appeals to these consumers because of rapidly changing product assortments and reflects a flux in fashion seasons. Traditionally, apparel manufacturers produced according to two cycles, winter and summer, and this has been replaced in fast fashion production by as many as six distinct periods in a year that reflect in-the-moment-trends enabled by just-in-time production (Ghemawat & Nueno, 2006, p. 9-10). Kaiser suggests that the industry trend toward a shortened fashion cycle is influenced primarily by postmodern eclecticism and ambiguity. She explains that the messages sent out by the fashion industry are no longer straightforward, and ‘the look of the season’ has been replaced with a diverse array of looks communicated through the media and social interactions (2005, p. 94). The result is an increase in impulse buying (exacerbated by the availability of low-cost goods), and a change in consumer attitudes towards the acceptability of buying from value retailers (Morgan & Birtwistle, 2009, p. 190). These changing habits have a global reach, as does the digital communication that facilitates their development.

Zara.

Zara is a fast fashion giant and “. . . was ranked 73rd in the list of the world’s 100 top brands 2006 by Interbrand, overtaking fashion brands like Hermes, Prada and Armani” (Lopez & Fan, 2009, p. 289). Zara’s keys to success rest in their flexible, responsive, and agile supply chain model. A supply chain is defined by Dornfield (2010) as the “. . . network of retailers, distributors, transporters, storage facilities and suppliers that participate in the sale, delivery and production of a particular product.” The following section selectively examines Zara’s supply chain model for practices that could be emulated by sustainable fashion brands in Toronto as Zara has a very impressive record of sustainable initiatives, as discussed below.

Zara's three pillars of success.

McCarthy highlights three pillars of Zara's success: (1) customer orientation; (2) process control; and (3) supply chain flexibility (2011, p. 546). Despite the use of varying terminology, other scholars such as Sull and Turconi have highlighted similar processes (2008, p. 8).

Customer orientation: low prices and communication.

The first pillar of Zara's success is customer focus. Through two basic commitments - low prices and open lines of communication - the company has been able to *respond* to consumer demands readily rather than *anticipating* them in advance. First, by offering runway styles made with less expensive fabrics and faster, less durable production techniques (which allows for a lower price point), Zara is able to quickly respond to the constantly evolving preferences of fickle consumers (McCarthy, 2011, pp. 541-542; Lopez & Fan, 2009, p. 281). Low prices and rapid turn-over foster more frequent shopping, and prices are set based on what the consumer is willing to pay for the quality and style being offered, and processes are then implemented to deliver products at these prices (McCarthy, 2011, p. 541; Lopez & Fan, 2009, p. 281). As an added consumer bonus, Zara replenishes stores with new designs twice weekly (some apparel retailers only re-stock once per month) and 11,000 new styles are launched yearly (McCarthy, 2011, p. 543; Lopez & Fan, 2009, p. 281). By enticing customers to visit frequently because of rapid product turnover, making smaller (more exclusive) quantities of each item, and setting prices low enough to be affordable for most, “. . . Zara sells 85 percent of its inventory at full price, compared with the industry average of 60 percent. . .” (McCarthy, 2011, p. 543). The profit reaped from these cost-conscious processes is higher than those experienced by the competition, who generally reduce their price tags after the selling season because of inaccurately predicted demand and the need to liquidate merchandise.

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The second component of Zara's customer orientation is its constant process of communication and feedback, which allows for more agile and responsive product shipments. Store managers communicate daily with customers and head office market specialists located in La Coruña, Spain through hand-held computers. These communications include sales results regarding particular styles, colours or sizes, and customer feedback or requests such as colours or items not offered in the store. Managers are also responsible for reporting their own trend-spotting, thus providing Zara with a huge fashion-oriented network of employees-turned-trend-forecasters (employees best understand demands because they constantly interact with consumers). This leads to insights into the market that is not found in other large apparel retailers (McCarthy, 2011, p. 541-542; Sull & Turconi, 2008, p. 8). Zara is therefore using its *customers' actual purchases* to dictate future offerings instead of using a designer's best guess.

Process control.

The second pillar of Zara's success is process control which is attributed to their ownership of all aspects of the supply chain. This vertical integration limits the possibility of interruptions and inefficiencies, thereby optimizing performance capabilities (McCarthy, 2011, p. 544). Process control also rests on two components: communication (again) and agility. The particular form of communication used in process control is enabled by face-to-face democratic meetings during design phases among smaller groupings of 300 market specialists, designers, procurement, and production planners at headquarters. Product concepts and sketches are passed through a small group consensus before reaching the cutting table, and Zara has created three centrally located open work spaces specially designed for this purpose:

Each hall has an aisle of desks down the centre, where the country managers sit, with desks interspersed at regular intervals with large meeting tables. On either side, there are areas with worktables surrounded by racks and shelves packed with sample products; this is where designers spend most of their time. Zara's open layout facilitates frequent face-

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to-face discussions rather than communication through email or spreadsheet. Designers and commercials refer to it as a culture of immediacy: when they have a question, they find someone who can help them and initiate the discussion right then and there. They can play with alternative explanations, bounce ideas off one another, and tackle issues from different angles simultaneously (Sull & Turconi, 2008, p. 9).

To foster greater cooperation among these teams, Zara has created a less hierarchical system than traditional multinational apparel brands. There are no enclosed offices, all desks are the same size, official titles are kept to a minimum, and employees on company flights all sit in coach (Sull & Turconi, 2008, p.9). In this culture of democratic immediacy, discussions about new products take place with designers who achieve consensus. Sketches are then handed over to the pattern department who create a prototype within a few hours, compared to the week or two most retailers wait to see new designs. Colleagues model the products in an open discussion and the determination to move forward with manufacturing is made by yet another consensus among most individuals involved (Sull & Turconi, 2008, p. 9-10).

“The speed of prototyping described above [also] permits designers to experiment more freely with possible items. The company creates mock-ups of approximately 25,000 items per year but culls about 60 percent of them before committing to production” (Sull & Turconi, 2008, p. 10; McCarthy, 2011, p. 542). Zara is also able to quickly test prototypes in relation to other currently available products in a 24,000-m² design hall located one level down from the meeting/work spaces, which they call Fashion Street. This space is made up of Inditex storefronts and contains entire collections of each subsidiary. Items can be viewed with concurrent collections to determine whether it fits with what is currently on offer in terms of colour, fabric and mood, as well as to determine alignment with current soundtracks, atmosphere, and store layouts. Items are immediately but carefully tested by a team of store architects, designers and visual merchandisers, and prototypes that do not fit are quickly

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eliminated before production (Sull & Turconi, 2008, p. 10). This cuts down on wasted production time and capital, and also ensures brand consistency on an international scale. This culture of immediacy by way of in-house prototyping and collaboration is more costly, but these costs are offset by Zara's unprecedented speed and flexibility of production. The company is able to keep inventory lean (reducing markdowns and lost profit margins) by manufacturing at least 50 percent of their merchandise in-season (Sull & Turconi, 2008, p. 9- 10).

The second facet of Zara's process control is vertical integration through ownership and tight geographical centralization among manufacturing facilities, which ensures Zara products hit the racks first. "Bucking the industry trends, Zara produces its more fashionable, trend-based items (50 percent of its total production) internally and only outsources production of basic items, such as T-shirts and classic sweaters, to low-cost manufacturers in Africa and Asia. . ." (McCarthy, 2011, p. 543; Lopez & Fan, 2009, p. 281). These basic items are not as sensitive to daily trend shifts, and they can therefore be manufactured and shipped more slowly without losing precious full-price saleability. Zara also internally sources from manufacturing subsidiaries owned by Inditex: 40 percent of Zara fabric comes from Comditel, and dyes are purchased from Fibracolor. After sourcing rapidly and locally, labour-intensive patterns are refined on CAD systems before they are transmitted to cutting machines where cut pieces are barcoded and sent to a network of more than 500 *local* subcontract sewers in Spain, Portugal and Morocco. These goods are made in *small batches* in *small workshops*- usually less than 50 people are employed at each and Zara often accounts for most of their business as many of these firms have worked exclusively with Inditex for many years. A steady flow of work in these facilities is maintained through the constant creation of new products, which is a stark contrast to the two-season fashion cycle that creates sharp peaks in manufacturing. Finished garments are

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sent directly to the distribution centre in La Coruña where inventory is barcoded and tracked using a proprietary software system. Goods are then placed on hangers, ticketed and sent directly to stores where new items hit the sales floor the moment they arrive (Sull & Turconi, 2008, p. 6; McCarthy, 2011, p. 543). To ensure rapid transit times, truck and air capacity is reserved on established twice-weekly schedules and delivery is guaranteed within 24 hours to European stores and 48 hours to North American and Asian stores (McCarthy, 2011, p. 544). This preferential treatment is made possible through Inditex's ownership of these facilities and lead times are further shortened by geographic proximity.

Supply chain flexibility.

The third pillar of Zara's success, supply chain flexibility, is maintained by the intense production speeds described above that allow constantly changing product offerings based on daily feedback from store employees. McCarthy has demonstrated that trend-forecasting errors increase in proportion to the time between design and sale of goods (2011, p. 545). In the traditional apparel industry, trend predictions can happen as much as twelve to fifteen months before the actual selling season for new designs, and if trends are inaccurately predicted then excessive stock ends up as markdowns and profit margins reduced (McCarthy, 2011, p. 544). In a process called postponement, the gap between predictions and sales is narrowed at Zara. Newly designed items arrive in stores within 4-7 weeks, modifications are made to less popular styles in only 2 weeks, and reorders (although rare) are filled in just three weeks (McCarthy, 2011, p. 544). Additionally, 50 percent of Zara merchandise is made as grey goods and later dyed in La Coruña at the design and manufacture centre (sometimes just days before shipment) based on daily feedback from store managers to ensure complete full price sell-through (McCarthy, 2011, p. 544). Zara's main competitors, Gap and H&M, outsource production and thus have to design

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new items up to five months before arrival in stores, costing them critical on-trend and full price saleability (Lopez & Fan, 2009, p. 292; Ghemawat & Nueno, 2006, p. 9 ; McCarthy, 2011, pp. 543- 544). Zara’s last-minute postponed approach allows the company to incorporate new information that can have a huge impact on sales such as regional weather forecasts, international events, and hot-topic appearances by celebrities (Sull & Turconi, 2008, p. 10).

Flexibility (smaller, more frequent, more responsive shipments) has the additional benefit of allowing Zara to carry less inventory than competitors. Whereas Benetton, H&M and Gap carry 14-15 percent of their annual inventory in store at any time, and traditional (slower) retailers carry 27 percent of their annual inventory, Zara’s average is only 10 percent, which “. . . indicates that Zara retail stores sell through their inventory approximately every 36 days compared with 99 days for the average women’s apparel retailer” (McCarthy, 2011, p. 545-546). Zara’s lean and intensified pace allows it to limit the costs of failed designs and quickly reorder successful designs (Sull & Turconi, 2008, p. 10), thereby limiting the financial inventory related risks Zara must take to maintain its status as a fashion-forward retailer.

Offsetting higher production costs.

Zara pays a high price to maintain their localized, communicative and agile processes; local labour is expensive, and air freight is not only costly but is also responsible for generating higher carbon emissions per garment (McCarthy, 2011, p. 545). Table 1 demonstrates the cost-offsetting advantages of more expensive but more flexible production.

Table 1:

Offsetting Advantages of Higher Production Costs in the Zara Supply Chain

Escalated Cost ^a	Offsets
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Escalated Cost ^a	Offsets
The use of local Spanish, Portuguese, and Moroccan labour	Offers trends in stores before the competition, allowing Zara to maximize sales before competitors have comparable items in store
In-house, rapid prototyping	Small batches encourage full-price purchases due to limited quantities
Fashion-Street and prototype testing in-house	Consensus-building limits failed samples reaching production and retail phases
Air freight	Less inventory is carried, reducing the risk of inaccurate trend forecasting
	Less out-of-season or off-trend merchandise is generated by small batch production, which results in decreased markdowns and higher profits

Note. Table is a summary of data already cited throughout literature review.

^a Costs are considered escalated when compared with the low-cost sourcing practices common to the apparel manufacturing industry.

Zara and sustainability.

Fast fashion has been characterized as using unfair labour and non-renewable materials, and creating excessive waste because of built-in disposability (Armstrong & LeHew, 2011, p. 38). There are, however, many ways in which sustainability and fast fashion are compatible in the Zara model. In fact, Zara is committed to a responsible supply chain and its financial success has not been significantly impacted by its reach for ecologically and ethically sound practices (Inditex, 2011, p. 124). While maintaining rigorous growth and profits, Zara also completed its 2007 Strategic Environmental Plan (PEMA) and “. . . at the close of 2010 [achieved] results superior to those initially forecast[ed]” (Inditex, 2011, p. 127). While a few of the PEMA-related activities can be described here, it should be noted that this list is in no way exhaustive but rather

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highlights the most pertinent points to this research.

PEMA takes a two pronged approach to sustainability. First, Inditex is reducing its global ecological footprint in every facet of the supply chain, and second, it is compensating for its total emissions (see Appendix B, Figure 2; Inditex, n.d., p. 12). Through this initiative, Inditex has been able to *increase* the number of garments going to market while simultaneously *decreasing* total emissions (see Appendix B, Figures 3 & 4). This strategy allows it to exceed its “. . . goal of cutting 2005 CO2 emissions level by 10% in 2015 and 20% in 2020” (Inditex, n.d., p. 13). As of 2011, “. . . Inditex has improved its overall efficiency and reduced its impact, including reduction of greenhouse gas emission, by 42% as compared with 2005” (Inditex, 2011, p. 124; Inditex, n.d., p. 14).

These reductions have been achieved in various ways. Inditex is the sole multinational corporation in the textile field to have all 25 of its premises (including the main building, chain headquarters, logical centres, and manufacturing facilities) ISO 14001 certified (Inditex, n.d., p. 5). It has created renewable energy plants within logistical centres to meet heat and power needs, and all the vehicles within the distribution centre (such as forklifts) are electric and do not require gasoline (Inditex, n.d., pp.7-8). After doing an intensive transportation audit and determining the best routes for optimization and efficiency, all drivers in Zara’s trailer fleet are professionally trained and the vehicles meet EURO 5 standards (Inditex, n.d., p. 8) by being powered with biodiesel fuel instead of traditional gasoline (Zara, 2010, “Our Mission Statement”). Inditex has also made great strides to demonstrate best practices in transparency and was “. . . one of the first Spanish companies to adopt Global Reporting Initiative (GRI) 2002 standards for sustainability reporting” (“Our model of sustainability,” n.d., para. 3). These practices have created “. . . good faith in relationships with stakeholders and society at large”

(“Our model of sustainability,” n.d., para. 3) and potentially expanded its consumer base in new, ecologically concerned markets. While these best practices are most easily adopted by a large, profitable multinational corporation, one can also view these initiatives as targets for smaller Toronto-based manufacturers. Because the research and development has already been done by a corporation with the budget to do so, these practices can be emulated by less expansive and financially powerful businesses.

Sustainability

Carter and Rogers point out that the emergent phase of any potentially useful idea that bridges multiple disciplines will initially create definitional ambiguities (2008, p. 364). This is particularly true of the term sustainability, a concept with many incarnations and applications, and that has been picked up by various industries and altered according to their needs. As such, there are many different vocabularies that have come to signify the same idea. In the present context, engineering literature provides the best definition as it considers social, environmental, and economic impacts equally (see Appendix C, Figure 1; Carter & Rogers, 2008, p. 363). This is commonly referred to as the triple bottom line, and is known in shorthand as the three Ps: people, planet and profit. A similar approach to design has been picked up by McDonough and Braungart who encourage the use of a triple bottom line C2C design matrix in the form of a *fractal design tool* that holistically incorporates ecology, equity and economy in equal parts (see Appendix C, Figure 2; 2002, p. 150). “Used as a design tool the fractal allows the designer to create value in all three sectors,” and practices or products that fall in the centre of the fractal are considered ideal (2002, p. 154).

Varying approaches to sustainability have been introduced to the fashion industry and the triple bottom line is only recently becoming an important feature. As global textile

consumption has been estimated at more than 30 million tons per year, and clothing production activities employ more than 32 million people globally (Braungart, 2007, p. 190), the industry's widespread impact *should* be a top priority for environmental consideration as it touches the lives of so many people (Ulasewicz & Vouchilas, 2008, p. 17). This has not happened, however, and Ulasewicz and Vouchilas (2008) point out that architecture has actually taken centre stage in environmentalist negotiations. This may be because of the existence and visibility of organizations such as Leadership in Energy and Environmental Design (LEED), which offers a tangible basis for decision making. While it is becoming widely recognized that designers are responsible for the sustainability of their products (Thiry, 2011; Armstrong & LeHew, 2011; Gam, 2007; McDonough and Braungart, 2002; Thorp, 2007; Rissanen, 2008), there is still no universal agreement on sustainable standards for apparel design and merchandizing (Ulasewicz & Vouchilas, 2008, p. 18; Gam, 2007, p. 3). Gam suggests the reason for this is a lack of information that could assist in the creation of a clear apparel design paradigm that meets all three bottom lines (Gam, 2007, pp. 54-59).

Although the Sustainable Apparel Coalition pioneered by Yves Chouinard (founder of Patagonia) attempts to resolve this deficiency by developing globally recognized standards and hang-tags for clothing, this initiative is expected to take more than two years to be fully implemented (Mowbray, 2010, p. 21). This new coalition was announced in late January 2011 and already accounts for 60 percent of global apparel sales, with early adopters including Walmart, Marks and Spencer, Levi Strauss, Nike, H&M, JC Penney, and Gap (Mowbray, 2010, pp. 21-22). The goal is to ensure ultimate transparency throughout the entire supply chain by putting the Nike Considered Index at the disposal of other brands (Mowbray, 2010, pp. 21-22). This tool can assess material impacts at the design and sketching phase, and Nike has already reported a

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reduction in its waste by using the tool as a benchmark when creating new products (Nike, 2010, “Nike Furthers its Commitment”). Making this available to smaller businesses *could* represent not only an environmental asset but also an economic benefit to those accessing the information, as the time and resources spent testing practices, fabrics and waste levels has already been done to determine best practices. While this initiative marks a step in the right direction for the apparel industry, waiting *another* two years for implementation means another 60 million tons of unsustainable clothing will enter the market if trends persist. This initiative may also require expensive dues for membership and thus would not be accessible to smaller manufacturing facilities.

The following section will demonstrate best practices available to smaller Toronto apparel manufacturers that will put them on the path to eco-effectiveness using a C2C approach. Full eco-effectiveness is a lofty goal given the currently available technology, materials and escalated operating costs associated with running a small business in Toronto. The emphasis here will be on demonstrating a model of smaller changes that can gradually be incorporated into practices without incurring membership dues or necessitating third party certifications, both of which can cost significant amounts of money.

Eco-effectiveness vs. eco-efficiency.

For McDonough and Braungart, there are two approaches to environmentalism: eco-effectiveness and eco-efficiency. The latter is the traditional approach used by industries and is described by the authors as ‘being less bad.’ This paradigm includes the famous three Rs, reduce, reuse, recycle, and “. . . stems in part from eco-efficiency’s economic benefits, which can be considerable. . . reducing resource consumption, energy use, emissions, and wastes has a beneficial effect on the environment as well – and on public morale” (McDonough & Braungart,

2002, p. 53). But slowing or reducing consumption does not stop resource depletion or end toxic contamination, and this paradigm merely slows these processes (McDonough & Braungart, 2002, p. 54). This system is also reliant on additional labour and processing, and Thorpe (2007) points out that “. . . almost anything is recyclable, but resources are needed to collect, sort, and reprocess the materials. The problem is that aside from the most commonly recycled materials (such as steel, aluminum, glass, and paper), no other recycling systems exist” (Thorpe, 2007, p. 40). This recycle-centric method has the added drawback of degrading the quality of materials through reprocessing, and often adds even more toxins or chemicals to make the materials useful again (McDonough & Braungart, 2002, pp. 61-63):

For example, people may feel they are making an ecologically sound choice by buying and wearing clothing made of fibres from recycled plastic bottles. But the fibres from plastic bottles contains toxins such as antimony, catalytic residues, ultraviolet stabilizers, plasticizers, and systems that cause the problem in the first place, merely slowing it down with moral proscriptions and punitive measures. It presents little more than an illusion of change. Relying on eco-efficiency to save the environment will in fact achieve the opposite; it will let industry finish off everything, quietly, persistently, and completely. . . Plainly put, eco-efficiency only works to make the old, destructive system a bit less so. In some cases, it can be more pernicious, because its workings are more subtle and long-term. An eco-system might actually have more of a chance to become healthy and whole again after a quick collapse that leaves some niches intact than with a slow, deliberate, and efficient destruction of the whole (McDonough & Braungart, 2002, pp. 61-63).

While this eco-efficient paradigm has been instrumental in spreading the messages of global environmental concern, it is reaching the end of its usefulness. Eco-efficiency simply does not reach deep enough, as “the goal is zero: zero waste, zero emissions, zero ‘ecological footprint.’” (McDonough & Braungart, 2002, p. 67). To be less bad is to accept that “. . . poorly designed, dishonorable, destructive systems are the *best* humans can do” (McDonough & Braungart, 2002, p. 67).

Instead, in an eco-effective paradigm, designers are empowered with the ability to re-conceptualize industrial processes. Rather than plying through guilt, eco-effectiveness offers an

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inspirational motivation to change and re-define the very concept of waste (McDonough & Braungart, 2002, pp. 65-66). The C2C approach suggests a new design assignment, one that does not tinker with existing problems but reinvents human-built objects and industries in a system in which the *concept* of waste does not exist. “It means that the valuable nutrients contained in the materials shape and determine the design: form follows evolution, not just function” (McDonough & Braungart, 2002, p. 104). Under this new paradigm of production, products are composed of *only* two types of materials (Braungart, 2007, p. 192). The first type is biodegradable; these materials are part of the *biological cycle* and return to the earth in a regenerative process over time. The second type is technical materials which are recyclable and should stay in a closed-loop *technical cycle* in which they circulate continually (McDonough & Braungart, 2002, p. 104). Both systems are independent of one another and contamination (termed ‘monstrous hybrids’) is not an option; technical materials do not decompose so they must be endlessly recycled, whereas biodegradable materials will disintegrate over time so their reuse is not endless (McDonough & Braungart, 2002, p. 104).

Eco-effectiveness emulates nature because waste is replaced with ‘regenerative abundance,’ a term McDonough and Braungart coined through comparison to a cherry tree’s excessive production: of the thousands of blossoms that fall to the ground, only a select few take root and the others are waste. The tree’s wasted blossoms, instead of degrading our natural systems and occupying valuable space within the eco system (as industrial wastes do), provide food for animals, insects and microorganisms— hence the term regenerative abundance. The tree and its surrounding life mutually depend on one another: its branches and roots house diverse species of animal, flora and fauna, and it turns carbon to oxygen cleaning the air and water, all while effortlessly creating and stabilizing the soil. When the tree has fulfilled its purposes and

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dies, “. . . it returns to the soil, releasing, as it decomposes, minerals that will fuel healthy new growth in the same place” (McDonough & Braungart, 2002, pp. 78-79). In a clear emulation of the cherry tree, C2C has provided an industrial framework in which waste becomes food (abandoned materials such as textiles are seen as nutrients) for other processes, renewable energy sources are used, and diversity is fostered and celebrated (Braungart, 2007, p. 191).

Five steps to eco-effectiveness.

The challenges of eco-effective design are numerous given the current conditions of manufacturing. Supply chains are global and items acquire significant carbon footprints before ever reaching the point of sale, people are sometimes harmed in the process through un-fair labour conditions or pollution, and implementing an eco-effective system is very costly. In fact:

When Gam (2007) attempted to implement the model in a manufacturer of children’s knitwear in Korea, it became clear that the manufacturer could not comply with the tenets outlined in the C2C [apparel design] model. Specifically, collaboration in the supply chain, knowledge and expertise necessary for analysis in materials selection, and considerations for energy use were largely absent (Armstrong & LeHew, 2011, p. 49).

Another, somewhat more successful attempt was later made by Gam, and some of these issues were resolved, although full eco-effectiveness still seems beyond reach given the available textiles and resource collaboration infrastructure (Gam, Huantian, Farr, & Heine, 2008). This system cannot be implemented immediately, but McDonough and Braungart outline five steps that can help its gradual introduction. In smaller-scale manufacturing facilities where existing global infrastructures do not need to be completely discarded, this transition can be less disruptive. This series of steps may also serve as a useful guide in which manufacturers could chart their own position in sustainable design and get a clear vision of areas require improvement.

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Step 1: Get free of known culprits.

In this first step, McDonough and Braungart advocate the use of what they call ‘a design filter’ in which harmful substances and materials are excluded by the designer early in the production of an item, rather than later in the supply chain (2002, p. 168). Some substances “. . . are known to be bioaccumulative and to cause such obvious harm that getting free of them is almost always a productive step. . . they include such materials as PVC, cadmium, lead, and mercury” (2002, p. 167). Fabrics that have been highlighted as harmful by the fashion industry include non-organic cotton, polyester, some artificial leathers and PET polyester.

The positioning of this as a *first* step is emphasized by McDonough and Braungart, as they also point out that doing so may lead to other problems. For example, if polyester (a non-renewable resource made of petrochemicals) is excluded from a supply chain, and cotton is used instead, the harmful effects of cotton (such as unethical labour, pesticide, water and land use) are introduced into the supply chain. They emphasize that “. . . simply being free of one thing [does] not necessarily make a product healthy or safe” (2002, p. 167). This bleeds into the next step, in which production materials are positively selected (instead of negatively filtered out) and consideration is lent to how they are combined (2002, p. 166). For example, blending polyester and cotton may improve the durability and care properties of a fabric, but because this is considered a monstrous hybrid in which a technical nutrient (polyester) is blended with a biological nutrient (cotton), it creates a highly ineffective fabric choice as the new material cannot be recycled or decomposed (McDonough & Braungart, 2002, p. 104).

Step 2: Follow informed personal preferences.

In this phase, design decisions are made based on aesthetic judgments and the best information available. Despite a material having better environmental properties, the decision to

use an unattractive material contradicts the goal of designing apparel for purchase (McDonough & Braungart, 2002, p. 169). McDonough and Braungart argue that while there are very few truly eco-effective materials available, we cannot put off production and consumption (2002, p. 169-170):

. . . we must begin somewhere, and odds are that as an initial step, considering these issues and expressing your preferences in the choices you make will result in greater eco-effectiveness than had you not considered them at all. . . You may find yourself choosing between a petrochemical-based fabric and an ‘all natural’ cotton that was produced with the help of large amounts of petrochemically generated nitrogen fertilizers and strip-mined radioactive phosphates, not to mention insecticides and herbicides. And beyond what you know lurk other troubling questions of social equity and broader ecological ramifications (McDonough & Braungart, 2002, p. 170).

They suggest three sub-steps to this phase of sustainable design: (1) prefer ecological intelligence; (2) prefer respect; and (3) prefer delight, celebration and fun. First, preferring ecological intelligence ensures that a selected material “. . . does not contain or support substances and practices that are blatantly harmful to human and environmental health” (2002, p. 171). In general, McDonough and Braungart suggest designers should prefer products that can be disassembled for recycling in their proper nutrient metabolisms (technical or biological) or at least recycled into another, somewhat less stable material (2002, p. 171). Preferring respect, although difficult to quantify in concrete terms, encourages designers to consider those who make the product. These manufacturing employees must be respected through fair treatment and pay, and the individuals who produce, harvest and transport fibres, materials, and finished products must also be treated and paid fairly. Finally, the customer must be respected through intelligent and considered design (2002, p. 172). The third sub-step, preferring delight, celebration and fun, suggests that products should be expressive on a human level (2002, p. 173). A consumer must be compelled to purchase the product over others based on expressive and aesthetic qualities, and the experience of buying and wearing must be pleasurable in order to be

truly eco-effective.

Step 3: Creating a passive positive list.

“In this phase, reconsider what a product is made of, not what it is” (McDonough & Braungart, 2002, p. 176). In this step, products are improved incrementally, without fundamentally changing or re-conceptualizing the final result (McDonough & Braungart, 2002, p. 176). For McDonough and Braungart, this is where design becomes truly eco-effective and looks beyond readily available information regarding contents of goods in favour of creating a detailed inventory of all materials used in a given product, as well as the substances produced as by products over the course of manufacture and use (2002, p. 173). This phase also highlights the importance of a life cycle assessment (LCA). According to Armstrong and LeHew, LCA is a comprehensive analysis of a product’s entire life cycle (from design to post-consumer use) and should be used to assess its *full* environmental impact (2011, pp. 41-42).

This type of in-depth research is challenging for smaller manufacturers who do not have the luxury of extensive and well-funded research and development teams. Since McDonough and Braungart published *Cradle to Cradle* in 2002, there have been numerous developments in environmentally responsible apparel design such as the creation of the Nike Considered Design Index. This tool puts more than a decade of LCA in the hands of its user and is used by Nike design teams, with the exception that users can manually input their own materials’ data (Nike Considered Design, 2010, “Understanding the Tool”). It has been specifically designed for ease of use and functions like a calculator to assign a numbers-based, objective, “. . . practical, understandable, and realistic benchmark . . .” (Nike Considered Design, 2010, “Understanding the Tool”). This makes the tool useful in creating a list of environmentally beneficial or benign materials, as suggested by C2C.

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After assessing the impacts of materials from an LCA perspective, designers can then categorize them into one of the following groups: the X list, the grey list, and the P list (also known as the positive or preferred list). The X list includes the most problematic substances that are harmful in direct or obvious ways to human or ecological health— these are known culprits. This list includes known carcinogens, non-renewable materials (such as polyester from petrochemicals), and PVC (McDonough & Braungart, 2002, p. 174). The grey list includes any substances that are considered problematic, but not as urgently so, including those that are needed for manufacture and currently have no substitutes (McDonough & Braungart, 2002, pp. 174-175). This list includes bamboo fabrics as these currently require a substance called caustic soda to extract fibres for use in textiles (Bamboosa, 2012). Finally, the P list, or positive/preferred list, includes any substances that are actively defined as healthy and safe in human as well as ecological terms. In general, this list excludes:

Acute oral or inhalative toxicity, chronic toxicity, whether the substance is a strong sensitizer, whether the substance is a known or suspected carcinogen, mutagen, teratogen, or endocrine disruptor, whether the substance is known or suspected to be bio-accumulative, toxicity to water organisms (fish, daphnia, algae, bacteria) or soil organisms, biodegradability, potential for ozone-layer depletion and whether all by-products meet the same criteria (McDonough & Braungart, 2002, p. 175).

Step 4: Activate the positive list.

After these three lists are generated, the designer is encouraged to work by positive-list inclusion, rather than simply excluding the known culprits on the X and grey lists. In this phase, redesign begins and products are created based on their positive human and environmental effects. Items are also designed for disassembly into biological and technical nutrient cycles, which allows these materials to remain in their respective metabolisms according to the C2C model of waste becoming food for other processes (McDonough & Braungart, 2002, p. 177). In this phase, future uses are considered as much as possible, and McDonough and Braungart have

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suggested “. . . encoding information about all of the ingredients in the materials themselves, in a kind of ‘upcycling passport’ that can be read by scanners and used productively by future generations” (2002, p. 178). An early prototype of this technology, though applied for different purposes, was used by the New York Prada flagship concept store that launched in 2001. Items of clothing carried a small electronic barcode that allowed shoppers to scan items and retrieve vital information about the garment such as its materials and manufacturing and often included videos of the garment in motion on the runway (Digital Wellbeing Labs, 2012).

Step 5: Reinvent.

In this final phase of the journey towards a sustainable design process, the designer begins to reinvent their products to become *good* for humans and the environment, rather than merely less bad. McDonough and Braungart use the example of cars and transportation: “instead of aiming to create cars with minimal or zero negative emissions, imagine cars designed to release *positive* emissions and generate other nutritious effects on the environment” (2002, p. 179). In this case, the entire system of transportation would need to be reconsidered as combustion engines clearly do not fit within this paradigm. This phase is best described by Brown and Williams when they explain that products are placed into three categories: consumable, service, and unmarketable. Consumable products decompose at the end of their life and are therefore made of biological nutrients (such as cotton or silk). Service products can be returned to the manufacturer for rebuilding or recycling after use and are therefore made of technical nutrients (such as polyester, which can be shredded and recycled, although this process still needs to be perfected). Finally, unmarketable products are either humanly or environmentally hazardous, or they cannot be recycled and cannot decompose, and therefore are not part of a C2C approach to design. These unmarketables include coated synthetic fabrics and

blended (biological and technical nutrient) fabrics such as cotton-polyester and any other blended monstrous hybrid (Brown & Williams, 1997, p. 31).

The cost savings of sustainability.

Implementing best practices is not easy and usually involves heavy initial capital investments. Additionally, environmentally preferred materials tend to cost more on average than their unconsidered counterparts. Thiry (2011) explains that the reason for this discrepancy is that true product costs are ignored by the conventional industry as retailers try to provide the most competitive price to consumers. This is echoed by Industry Canada's explanation that the environmental and social impacts of economic growth are not reflected in the measure of gross domestic product (2011b). This means the final consumer is not paying for the environmental and social costs of products, and prices are distorted in a way that does not reflect supply chain realities. This situation cannot be sustained long-term and "to maintain economic growth more effort has to be placed on the production of technology and capital in order to produce goods for future consumption, rather than the production of goods for current consumption" (Industry Canada, 2011b). Preparing for eco-effectiveness will incur extra short-term cost, but the offsetting advantages of this type of preparation are numerous.

First, there is the market advantage of transparency. Gam has noted that consumers are reluctant to make purchases featuring a sustainability claim because of "... higher prices, little choice, aesthetic and functional disadvantages, lack of information, and uncertainty about actual benefit to the environment." (2007, p. 4). Consumer trust *could* be built through responsible growth and the effective communication of sustainability goals and initiatives. Before businesses can become transparent though, they must have something to boast about— in this case, environmentally and ethically responsible practices.

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Carter and Rogers outline more immediate cost offsets (and boasting points):

Activities such as reducing packaging, improving working conditions in warehouses, using more fuel efficient transportation, and requiring suppliers to undertake environmental and social programs, as just a few examples among many, can reduce costs while also improving corporate reputation (2008, p. 361).

Additionally, observing ISO 14000 standards is proven to reduce costs, shorten manufacturing times and create better-quality products by implementing a framework for environmental management systems (Carter & Rogers, 2008, p. 370). Providing a better working environment lowers labour, health and safety costs due to increased employee motivation and productivity while simultaneously reducing absenteeism and lowering recruitment and labour turnover (Carter & Rogers, 2008, p. 370).

Finally, in extreme circumstances, operating costs can escalate if a company acts unethically or illegally and exploits the land or the people involved in production. A company can incur legal fees or, heavy transaction costs as shareholders may require investment monitoring, and governments may require regulation and reporting. This kind of monitoring is done at the expense of the offending business who must hire third-party organizations. Therefore, “to the extent that an organization can eliminate opportunistic behavior (improve social sustainability) in its supply chain, this should lower the firm’s costs, thus improving the economic component of sustainability” (Carter & Rogers, 2008, p. 375).

Toronto

Although benchmarking and best practices for fast and sustainable apparel production are generalizable to many localities, Toronto is in a unique position to revitalize the downtown fashion industry. This research is particularly concerned with Toronto because of the recent declines in production since the turn of the millennium, and because according to the C2C model proposed by McDonough and Braungart, “all sustainability is local and should respond to local

environmental concerns" (2002). McDonough and Braungart suggest that eco-effectiveness must be rooted in the locality in which it is practiced. The reasons for this are that people from different regions have specific needs that differ from those in other locales, and solutions must meet these specific needs in order to be truly effective (2002, pp. 118-157). Respecting diversity in the C2C model includes "... diversity of place and of culture, of desire and need, the uniquely human element" (2002, p. 119). Armstrong and LeHew have determined that contemporary apparel businesses must be more responsive to narrowing markets and shifting tastes; they must respond to specialized consumer preferences (2011, p. 32). Toronto's apparel needs and desires have changed significantly in recent decades, and local manufacturers must adopt fast fashion in order to compete with the multinational retailers who have taken over the Fashion District. This section will describe some of the more important developments that have adjusted Canada's consumption patterns in general, and will then examine the particular conditions in Toronto that make the apparel manufacturing industry ripe for revitalization.

The impact of international trade agreements on Canadian manufacturing.

Canada is at a competitive disadvantage in apparel production. There are strict and costly labour standards that must be upheld, and extremely high operating costs are incurred in Toronto due to expensive urban rental or purchase agreements and textile import costs because Toronto does not have a strong textile production industry. This strains smaller businesses that already struggle to compete with large multinational retailers that entice trend-seeking shoppers with low prices. This strain has been intensified significantly since 1989 due to changes in trade agreements and the resulting influx of inexpensive imports (Wyman, 2006, "Overview," para. 3).

Diana Wyman's 2006 article written for the International Trade Division of Canada succinctly describes three important changes to Canada's retail climate. It is worthy of note that

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the first structural shift was profitable, as the 1989 introduction of the Free Trade Agreement (FTA) increased Canada's clothing exports by more than ten-fold by 1998. However, this also led to an influx of American-made goods, and the US became the main supplier of foreign clothing to Canada ("Overview," para. 3). This agreement fostered a prosperous apparel production environment and "... employment in the Canadian apparel industry rose by nearly 20,000 to a peak of 94,000 employees in 2001" ("The FTA and trade in clothing," para. 5). The concentration of this clothing production was in Quebec and Ontario, and in 2001 "the Ontario clothing industry employed 24,500 [people]. . . By 2005, this had dropped by 8,000 to 16,500. . ." due to the second and third shifts discussed below (see Appendix D, Figure 1; "Employment rose," para. 5).

The second market shift granted an advantage to some of the least developed countries in the world (such as Bangladesh) when Canada gave those nations unrestricted access to the Canadian market on January 1st 2003. Quotas limiting the volume of exports to Canada were lifted for all World Trade Organization (WTO) member countries in accordance with the Agreement on Textiles and Clothing (ATC) between 1995 and 2002. China was initially excluded as it had not become a WTO member until December 2001 (Wyman, "Overview," para. 5; Lopez & Fan, 2009, pp. 279 - 280). This meant that while developed countries were disadvantaged and subjected to import/export quotas and large tariffs, imports from developing countries such as Bangladesh tripled between 2002 and 2005, making their imports slightly more prominent than the US's and second only to China's after it joined the WTO (Wyman, "Overview," para. 4).

The third and final shift discussed by Wyman created a 47 percent spike in Chinese imports by 2005 ("Overview," para. 7), as "after more than 40 years of protectionism, the textile

and apparel sectors removed import quotas in accordance with the rules of the General Agreement on Tariffs and Trade” (Campaniaris et al., 2010, p. 11). This influx replaced previously important suppliers from other developing countries such as Hong Kong, Taiwan and South Korea. This also signalled the slow decay of domestic production and the previously prosperous FTA relationship with the US as only select countries were able to maintain their Canadian export stronghold such as India, Mexico, and Bangladesh (see Appendix D, Figure 2; Wymann, 2006, “Overview,” paras. 6-7; Campaniaris et al., 2010, p. 12).

The opportunity for revitalization.

Canada’s trade imbalances are problematic, and despite the most recent decline in Toronto apparel manufacturing there is a great need to produce items in more developed regions, and in Toronto in particular. There are two main factors pointing to the need for localized production: the benefits of increased economic activity through diversification and the environmental degradation found in less developed nations.

Increased economic activity through diversification.

First, and to put it simply, workers are wearers. By employing Torontonians in smaller apparel manufacturing industries, the local economy stands to benefit not only through potentially increased trade but also by generating local employment opportunities (Campaniaris et al., 2010, p. 19). Smaller, more diverse and localized production helps stabilize economic activity, thereby significantly improving regional and local economies (Campaniaris et al., 2010, p. 19). A diversity of industries is strong and a monoculture is weak. By removing industries one by one, an ecosystem (or economic system) becomes less stable, less able to withstand disruptions such as recessions or resource shortages, and less able to stay healthy and evolve

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over time (McDonough & Braungart, 2002, pp. 121-122; Fletcher, 2008). To use McDonough and Braungart's example, the energy shortages experienced in eastern North America in 2001 could have been avoided if there was a diversity of energy suppliers who were been able to handle the load. Also, the negative impact of the shortage would have been more localized if only one smaller energy supplier was overrun, as more distant neighbours would have kept the lights on. The same is true of an economic system: a diversified industry produces providers and customers who can thrive if one element disappears (McDonough & Braungart, 2002, p. 132). The Toronto apparel manufacturing industry must be diversified and it must encompass the varied and changing needs of local consumers.

The Richter Report was published in 2004 by Richter Consulting, and presented an alternative business model for Canadian apparel companies that emphasized the need to refocus and specialize in specific aspects of the supply chain. These strategies included:

. . . lead thanks to exceptional design, create a lifestyle brand, become an integrated apparel/retail company, be a low-cost commodity producer, be a product innovator, become an importer that distributes to fragmented retail channels, be the preferred rapid replenishment supplier to mass merchandisers, and provide several innovative collections per season by shortening the design-to-sale cycle . . . (Campaniaris et al., 2010, p. 15).

These strategies are in line with the more obvious fast fashion principles of rapid production and replenishment, increasing the number of collections per season, and providing low cost goods. These strategies are also less obviously aligned with eco-effective design practices. An eco-effective practice *also* demands that products are designed exceptionally and are innovative. In C2C terms, this describes the final eco-effective step of reinvention. Toronto's apparel industry and the workers it could potentially employ stand to benefit by seriously considering both the Richter Report's findings and the C2C approach.

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Furthermore, according to the City of Toronto's Agenda for Prosperity (2011), the city is willing to invest in much-needed infrastructure improvements with a particular emphasis on sustainability. In June 2006, the Mayor's Economic Competitiveness Advisory Committee developed an action plan for investing in Toronto's future prosperity. The plan is intended to help Toronto become:

[1] a global business city where trade, finance, technology and a multi-lingual population combine to make the global economy efficient and accessible; [2] the world's inspiring city that sets the standard for how global cities innovate to solve urban and metropolitan challenges such as climate change, energy conservation and efficiency, human wellness and security; [3] a hub of environmental innovation that provides environmental solutions for the world at the same time as it evolves into a centre for environmental technology development and production; [4] a beacon of diversity and cohesion, that exemplifies the sustainable advantage of diversity for all to see (City of Toronto, "Agenda for Prosperity," 2011).

This stimulus from the City of Toronto comes at an ideal time as 41 percent of current small business owners in the city will retire within 5 years, and 71 per cent will retire within the next 10 years (Canadian Youth Business Foundation, 2006).

Aside from potential city funding to promote stimulation, there are many apparel-specific resources available to Toronto designers such as the Fashion Takes Action (a consulting agency, founded by Kelly Drennan that offers sustainability education and coaching programs for local apparel businesses) (Fashion Takes Action, 2011) and the Toronto Fashion Incubator, which offers business support, production facilities, educational resources and a vital link to costly trend-forecasting services such as Worth Global Style Network (Toronto Fashion Incubator, 2010). Toronto provides opportunities for designers by hosting its own Fashion Week, a Clothing Show and an Alternative Fashion Week. The downtown core also houses Ryerson University, from which this research emerges. This institution is widely recognized for its

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superior Fashion Design and Fashion Communication programs, and was also the first Canadian university to offer a Master of Arts degree in Fashion. Training facilities within Toronto are accessible and produce new talent with increasing numbers. Given all this, Toronto is primed and ready to supply the local labour and resources needed to explore new, diversified apparel production through an increase in smaller manufacturing facilities that will foster economic growth within the city.

Environmental degradation in less developed countries.

The second factor that suggests the need for increased Toronto apparel production is the environmental degradation that is currently hidden by lengthy and complex multinational supply chains. Buyers, designers, brand owners, and consumers are unaware of the origins of fabrics, and the environmental and working conditions in distant factories. This information is sometimes hidden intentionally, while at other times it is simply difficult to collect the necessary data because of the complexity of a globalized system (Thiry, 2011; Dornfield, 2010). Economic, political and social factors have combined to produce a lag in available manufacturing technology while allowing information to be left out of reports. Overall, there is a distinct lack of transparency. These discrepancies are caused by the need to offer a competitive price, and the physical distance between manufacturing atrocities and the final consumer (Braungart, 2007; Thiry, 2011; Dornfield, 2010). Environmental regulations also tend to be more relaxed in less developed countries as industrial activity is relatively new to those nations. The impacts of production are often not assessed or regulated and

[a]s a result, developing nations implement considerably fewer sound technologies . . . Developing countries account for approximately 50 percent of world textile exports and

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70 percent of world clothing exports. They also contribute a disproportionate amount (81 percent) of textile sector water pollution. (Braungart, 2007, p. 195)

By bringing production back to industrialized nations such as Canada, the global ecosystem can be preserved through visibility. “When citizens live elbow to elbow with large corporations, there's far more public pressure on firms to act like responsible members of the community—particularly on issues like the environment, which affect everyone” (Sorensen, 2001). Morgan and Birtwistle have also noted that consumers “. . . might consider modifying their clothing consumption and disposal behavior if they were more aware of the social and environmental consequences” (2009, p. 196). They demonstrate that “if the environmental impact of clothing manufacturing and disposal was more widely publicized . . . clothing retailers would soon have to adapt their collections and sales strategies” (2009, p. 196). Toronto is therefore in a unique position to provide an innovative product to apparel consumers, that meets contemporary apparel consumer demand through diversified, ecologically responsible industries within the city.

Research Questions

These exploratory questions were developed based on the categories of production model assessment used to thematically analyze literature reviewed (see table 2 below). The aim was to determine the necessary conditions under which a fast fashion model of sustainable apparel production could be made possible in Toronto:

1. How can the contemporary fashion consumer's desire for fast fashion be reconciled with a fully sustainable C2C approach as proposed by William McDonough and Michael Braungart?
2. What design, production, sourcing and transportation practices would ensure eco-effectiveness according to the C2C model?
3. What conditions are necessary to ensure this production can happen in Toronto?
4. What are the challenges faced by this new production model and how can they be overcome by Toronto manufacturers?

Methodology

After completing a thorough thematic review of the literature (see Table 2), this exploratory, qualitative research was triangulated by two data gathering methods: (1) a semi-structured interview (see Appendix E); and (2) an online questionnaire (see Appendix F; Creswell, 2009, p. 191). Data was then selectively coded by the researcher and research supervisor in an inter-rater agreement process to determine the results of this research. A more in-depth description of these processes follows.

Table 2:

Categories of Production Model Assessment Used to Thematically Analyze Literature Reviewed

Textiles ^a	Design	Production	Transportation
Growth and production of textiles ^a	Construction	Working conditions	Distance travelled
Availability in Toronto	Waste elimination	Environmental impact of processes	Storage
End of life considerations (e.g. biodegradability)	Durability	Speed	Speed
Technology and innovation	Speed	End of life considerations	
	End of life considerations		
	Technology and innovation		

^aAs the production of textiles represents an entirely separate supply chain that has its own practices and environmental impacts, it was only partially examined throughout this research. This is an acknowledged limitation of this study as all practices related to the manufacture of goods must be considered before a product can be called truly sustainable according to the definitions used here (Thiry, 2011; Gam, 2007, p. 21; McDonough & Braungart, 2002; Fletcher, 2008).

Instrument Development

After obtaining Ryerson Research and Ethics Board's approval for research involving human subjects (see Appendix G), the instruments of research (an interview and online

questionnaire) were developed to answer the research questions. As the scope of academic research involving sustainable practices was still somewhat limited at the time of study, universal definitions and best practices had yet to be agreed upon. All participants were therefore asked to define sustainability in personal terms and these definitions were used to explore *potential* best practices and opinions held by the participants. It was made explicit that current practices were *not* the focus of questioning, as this could lead participants to provide inaccurate responses. Previous sustainability focused research has found that participants may skew responses in an effort to *appear* more environmentally motivated, while actual practices may vary from what is reported (Rudell, 2006, p. 285; Wutich & Gravlee, 2010, p. 204). As this research aims to determine best practices for future use instead of examining currently employed practices, the actions of participants were less important and preferred actions were granted more weighting. This also reduced (but did not nullify) the potential of skewed participant answers based on pre-conceived motivational value judgments (see the section Limitations).

Sample description.

Two groups of participants were selected based on the predetermined characteristics highlighted in Table 3. Both categories of participants were necessary: a sustainable fashion expert's opinion is rooted in *potentiality* and best practices, and a Toronto fashion professional's opinion is based on their *practical experience* as contemporary designers and business people in Toronto. The latter group also allowed for a more diverse participant selection as practitioners not currently engaged with sustainability could be selected to ensure less biased results. One sustainable fashion expert and ten Toronto fashion professionals were selected based on their engagement with fast fashion *or* sustainable fashion, *and* localized fashion apparel manufacturing business models.

Table 3:

Characteristics of Sustainable Fashion Expert and Toronto Fashion Professionals

Sustainable Fashion Expert	Toronto Fashion Professional
May or may not own a fashion manufacturing business	Owns or oversees the operation of a Toronto-based apparel manufacturing business <i>and</i> claims to engage in practices congruent with either: <ol style="list-style-type: none"> 1. a sustainable or better practices ('less bad' as described by C2C) model of production 2. and/or a fast fashion model of production (as described by Sull and Turconi in 2008, and as demonstrated by Zara)
Has strong understanding of sustainability principals as they relate to apparel production	May or may not have a strong understanding of sustainability principals as they relate to apparel production
Has been granted the authority and/or ability/experience in consulting apparel manufacturers in 'better' or sustainable practices but may or may not apply those principals themselves in apparel manufacturing	Has <i>not</i> been granted authority and/or ability/experience in consulting apparel manufacturers in 'better' or sustainable practices, but may apply those principals themselves in apparel manufacturing
Operates primarily as a consultant (physical production is of less importance, and expertise and information dissemination in sustainability field is the highest priority)	Operates primarily as a manufacturer (physical production is the highest priority, and expertise and information dissemination in sustainable field is of less importance)

Sustainable fashion expert interview.

First, a semi-structured interview was conducted with sustainable fashion expert Kelly Drennan (see Appendix E). This style of interview was selected as it allows for probing questions to investigate areas not originally foreseen by the interviewer while simultaneously providing a more relaxed and naturally conversational atmosphere for the interviewee to facilitate a more comfortable and detailed disclosure (Seale, 2004, p. 182). This casual, conversational style was deemed necessary by the researcher and the research supervisor as the

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material being discussed could be seen as somewhat sensitive, subjective and controversial.

Drennan is the founder of Toronto's Fashion Takes Action and was interviewed because she demonstrated all the characteristics outlined in Table 3. Drennan has acquired authority and expertise in sustainability through years of engagement in the field and has become widely recognized in Toronto as a media and fashion industry authority (Fashion Takes Action, 2011, para. 6). Drennan has “. . . successfully aligned Fashion Takes Action with many leading businesses and [Environmental Non-Governmental Organizations] ENGOs” (Fashion Takes Action, 2011, para. 2).

Drennan was contacted by the researcher through e-mail (see Appendix H). The study was briefly explained, she was asked to read and sign a letter of information and consent to disclose her identity (see Appendix I), and was also provided a copy of the Ryerson Research and Ethics Board's approval (see Appendix G). Drennan met with the researcher on January 10, 2012 at 1:00 PM in a coffee house she selected. Before the interview began, Drennan was provided with a hard copy of the letter of information and consent, and her signature was obtained. The interview lasted one hour, and an audio recording was made and later transcribed verbatim. Drennan was then sent a copy of the transcription and given the opportunity to revoke any and all comments from the record before results were analyzed and reproduced, in their edited form, throughout this research paper.

Table 2 represents the initial categories of investigation for this research and served as a guide for the literature review. These categories were then reassessed based on the literature review data to create the categories of Table 4 that guided the instrument development. The interview questions posed to Drennan (see Appendix E) were selected based on their ability to address the research questions and their relevance to Toronto fashion production, the C2C

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approach and fast-fashion imperatives as modelled by Zara. Figure 1 visually demonstrates the relationship of these areas of inquiry to one another for the purposes of this study.

Table 4:

Initial Categories of Inquiry Informing the Semi-Structured Interview with Kelly Drennan

Sustainability (C2C)	Fast Fashion	Toronto Fashion Production
Personal definition	Personal definition	Local sustainability requirements
Waste produced through the manufacturing of apparel	Impact on local fashion industry	Local barriers to sustainability (geographic, social, economic, and ecological)
Waste elimination potential	Ideal time-frame of production (from design/sketching phase to retail)	Local barriers to production (geographic, social, economic, and ecological)
Apparel end-of-life	Quality and durability expectations of apparel	Textile sourcing and availability to local manufacturers
Transportation of raw materials and finished products		Local manufacturing locations
Social responsibility and worker equity		Local manufacturing conditions

Note. The three major areas of inquiry are inextricably bound to one another when discussing sustainability. Effects in one area, such as ecological impacts, will necessarily impact other areas, such as localized production. An example of this is local environmental legislation and how laws are upheld within individual sites of manufacturing. These categories are therefore loosely defined here to allow the interview participant to easily move from one category to the next to describe the affective relationship between them while simultaneously providing information within each respective category.

Toronto fashion professional online questionnaire.

After conducting the semi-structured in-person interview with Drennan, the categories described in Table 4 were again analyzed for depth and comprehensiveness based on interview feedback. While Drennan did not actively participate in the online questionnaire's creation, her responses during the interview were used to determine the potential effectiveness of the questions used.

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The questionnaire (see Appendix F) was designed to engage participants for approximately 30 minutes to 1 hour, depending on the length and depth of the answers provided. The qualitative online short-answer method was selected to increase sample size as it facilitates participant comfort, and removes the need for transcription and face-to-face time with the researcher. This method also allows respondents to select a time of day that best suits them, and they can complete their responses anonymously and privately. This may reduce the potential for skewed results based on sensitive business issues that arise in discussions of sustainability and economic imperatives. This method has two pre-identified limitations: it removes the ability to ask probing questions, and it may reduce the length (and therefore depth) of responses because participants must spend time typing their answers rather than communicating them verbally. It was determined that these limitations were outweighed by the benefits of confidentiality (the respondent's identity was not linked with their responses), comfort and a larger sample size. Additionally, this format allows respondents the time necessary to fully conceptualize, articulate and edit their responses before submitting them.

Results

Ten Toronto fashion professionals defined in Table 3 were contacted electronically (see Appendix J for initial contact e-mail). Of these initial contacts, four agreed to participate and three completed the questionnaire in its entirety. During the initial contact, participants were informed of the kind of involvement the project required of them and they were encouraged to become “. . . genuinely involved as creative participants . . .” so that their feedback would be valuable, even if it was critical or contrary to the original hypothesis of the research (Gray & Malins, 2004, p. 70). After agreeing to participate, respondents were sent an electronic letter of

consent that contained a link to the survey (see Appendix K; Seale, 2004, p. 421). By clicking on the link, participants were informed that they were agreeing to the terms of consent.

Analysis of Data.

Results from both the interview and the online questionnaires were thematically coded by the researcher and the research supervisor. Codes were selected according to an iterative process in which early definitions represent the researcher's hunches or theories, and are refined through repeated engagements with the text (Wutich & Gravlee, 2010, p.198). In-vivo codes were used, which are defined by Wutich and Gravlee as using the informant's own words to code content (2010, p. 204). This was ideal as varying language was used to describe similar practices due to the lack of universal sustainability definitions (Carter & Rogers, 2008, p. 364). For the purposes of this study, a theme was defined as "... an underlying (dimension of) meaning that cuts across a variety of expressions" (Wutich & Gravlee, 2010, p. 196). A process of selective coding was also used, and in which open codes are collapsed into larger categories of analysis that are then brought together to summarize the phenomenon (in this case, ideal sustainable apparel manufacturing practices) being investigated (Wutich & Gravlee, 2010, p. 203). To ensure validity, multiple coders were used to analyze texts in a process called inter-rater reliability, or inter-coder agreement (Wutich & Gravlee, 2010, p. 199; Creswell, 2009, p. 191). For the purposes of this study, two people (the researcher and the research supervisor) arrived at an 80 percent agreement on themes. While studies with a larger sample volume would require many coders to ensure validity, two coders were deemed sufficient given the smaller sample size.

Text was deemed the ideal method of data capture as it is well suited to a multi-method approach and "... text analysis is apt for capturing complicated, contested, or mutable phenomena. Because text analysis is so flexible, it allows researchers to track complex processes

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and to capture multiple perspectives and marginal voices” (Wutich & Gravlee, 2010, p. 208-209).

Emergent themes were correlated to fast fashion and C2C as described in the literature review. The goal of synthesis was to determine best practices in Toronto to create potentially competitive, profitable, equitable and environmentally responsible apparel production (see Figure 1).

Analysis and Discussion

Emergent Themes

The following section addresses the research questions according to four prevalent themes arising from the primary data, blending direct quotations from participants with the researcher's own interpretations of meaning. In Table 5, emergent themes from local manufacturers are correlated to the C2C model of eco-effectiveness and fast fashion principals as modelled by Zara and demonstrated in figure 1. The four themes are summarized as:

- (1) building awareness
- (2) locally made materials and products
- (3) sustainability convenience and incentives
- (4) the pace of apparel production

Table 5:

Correlation of Primary Data Themes with C2C Eco-Effectiveness and Fast Fashion Production

Emergent Themes from Primary Data	C2C Eco-Effectiveness Applicability	Fast Fashion Production Principles
Building awareness: Education must be addressed to encourage the widespread adoption of best practices.	Rules 1 and 2: Harmful substances must be identified so they can be excluded and informed decisions can be made.	The lean and agile benefits of fast fashion practices must be highlighted to counteract an unsustainable reputation among Toronto designers and enable competition with these products.
Locally made: Fabrics and apparel must be produced near to their sites of sale to be considered sustainable according to personal definitions; Toronto does not have a strong textile industry.	Rule 3: Beneficial materials will generate employment and manufacturing opportunities within Toronto while lowering carbon emissions.	Locally made textiles and finished garments ensure rapid delivery times and create a leaner, more customer-responsive system that does not attempt to anticipate consumer demand but instead reacts to actual observed demand.

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Emergent Themes from Primary Data	C2C Eco-Effectiveness Applicability	Fast Fashion Production Principles
Sustainability convenience and incentives: These must be put in place by governing bodies or through local collaborations.	Rule 4: Positive materials must be put into and practices into action by creating advantages for their use.	Lean supply chains generate less waste as items are not produced in excess of demand.
The pace of apparel production: Four to six buying seasons must become normative practice in Toronto to enable more frequently changing product assortments.	Rule 5: Toronto's fashion industry must be reinvented to accommodate contemporary consumer demand for rapidly changing product assortments while providing a more stable working environment within manufacturing facilities. This will also limit the resources wasted because failed designs or inaccurate predictions of demand.	Fast fashion producers create products during the selling season in smaller quantities, replenishing them as dictated by demand. The result is an increased number of fashion seasons from two to as many as six or more distinct periods in a calendar year.

Building awareness.

According to the participants, building awareness is integral to the production of sustainable apparel. Manufacturers must see the benefits and processes of environmentally responsible production, and consumers must be educated to ensure the required level of demand. Research questions two and three asked what design, production, sourcing and transportation practices would ensure eco-effectiveness according to the C2C model, and what conditions are necessary to ensure this production can happen in Toronto? The theme of building awareness addresses these questions by highlighting the need for universal definitions that are free of ambiguities, though these questions cannot be fully answered until agreement on best practices has been reached. Drennan is a sustainable fashion expert but did not have a unified and clearly defined definition stating, “at Fashion Takes Action we have several definitions of what sustainable fashion means.” Participants’ ambiguous and varied answers regarding their

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definition of sustainable fashion also points to the need for third party definitions and clarifications, and participants suggested governmental intervention to build awareness among consumers and producers.

While all respondents agreed that in order to be considered sustainable an item must be ethically made with environmentally responsible materials, there was a lack of consensus regarding what a responsible material is and what labour practices are ethical. Sporadically identified sustainable materials included any upcycled materials (such as second-hand textiles that are re-cut and sewn into new garments), hemp, organically grown cotton, recycled polyester and closed-loop bamboo (in which the chemicals used to extract fibres are recycled indefinitely instead of discarded after each use). Some of the identified ethical practices included providing work spaces that are clean, with two participants suggested that windows must open and one noting that work tables must not be crowded and should be at the proper ergonomic height and that “. . . good seating. . .” should be provided. Drennan claims:

. . . a good workspace is a place where you feel comfortable. . . you’re not in a dark basement, dark, mouldy, damp basement, so a clean and healthy environment . . . there’s heat if it’s cold . . . you’re offered breaks; you can sit down and have lunch . . . you can call in sick . . . Obviously, the bigger you get, the more you’re getting into things like benefits and holidays and all of that stuff.

These somewhat scattered answers point to gaps in awareness and Drennan herself claims to have only seen ethical conditions because of her specific role in the industry: “. . . there are unfairly paid workers; I just don’t personally know any designers that are using them, because I only tend to work with the sustainable ones.” However, in the online questionnaire, participants (who *actively participate* in the industry) unanimously acknowledged that current apparel manufacturing jobs in Toronto are subject to unfairly low wages. This suggests there are

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unethical conditions but they are at least partially hidden from experts. This knowledge gap occurs *within* the industry itself and points to the need for increased educational opportunities so manufacturers know exactly what is expected of them (see Table 5). By making conditions transparent, consumers may also be willing to pay slightly inflated product costs if they knew they were supporting ethical, fairly paid jobs within their communities. This assertion is supported by Rudell who believes that consumers are willing to pay more for “. . . peace of mind. . .” when they make purchasing decisions (2006, p. 285), though a higher price tag is not consistent with a fast fashion model.

The fourth research question asks about challenges regarding this new production model and how they can be overcome by Toronto manufacturers. The participants identified some barriers to creating sustainable apparel according to their own somewhat erratic definitions. The inflated costs of the responsible textiles that were identified by participants and Canadian labour laws are seen as inhibiting competition with less expensive foreign imports. Despite online participants agreement that Toronto workers are not paid enough, there are still minimum wage laws in place that limit directly competing with lower-wage overseas labour. Half the total participants agreed that this inhibitor could be overcome if consumers were educated about the ecological and social impacts of apparel production, as they would then demand local products. To facilitate this without incurring a higher price tag on finished goods, one participant suggested the Canadian government should intervene and create conditions in which local manufacturing is made easier and less expensive than importing goods. This was acknowledged by the participant as being “. . . a bit protectionist. . .” and no specific interventions were described. Drennan also suggested a top-down approach

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. . . where this technology is invented by the big brands . . . the multinationals – that have the capacity to do it and then share it . . . we are moving into a more shared collaborative space. . .

This kind of optimistic collaboration would allow the industry to establish normative, better practices without smaller businesses losing competitive advantages or their ability to offer low pricing. There is, however, the issue of proprietary information, and what is currently being shared is quite limited. Drennan seems confident this will improve, and the great (but slow) strides made by the Sustainable Apparel Coalition seems to support her claim (as discussed in the review of literature).

This theme relates to C2C's first two rules of eco-effectiveness and the Zara model of fast fashion. The first and second rules, which are becoming free of known culprits and following informed preferences, can only be achieved if best practices are universally agreed upon (see Table 5). The Toronto fashion industry must identify the culprits (for the participants, these were irresponsible fabric and labour choices) before they can be eradicated. As Gam (2007) indicates, many designers are left without a clear paradigm of production as they are not informed that sustainability is their concern and are not given the tools or education to ensure a sustainable product is made. The participants in this study were aware they must compete with fast fashion products, but seem to be unsure of the production practices that make fast fashion successful. Zara's best practices could be highlighted as one of the potential models for producing competitive apparel in Toronto. However, until awareness is raised regarding these issues, and the culprits are widely known, the existing paradigms of manufacture will continue to be prevalent because people are largely unaware of which current practices are problematic and what must be done to create a more competitive product.

Locally made materials and products.

Producing fashion locally raised three sub-themes among the participants:

- (1) an absent Toronto textile industry
- (2) the need to make sustainable transportation decisions
- (3) the need to explore markets outside Toronto to support business growth

This localized manufacturing theme responds to research question two, which asked about the design, production, sourcing and transportation practices that would ensure eco-effectiveness according to the C2C model. First, there was a consensus that in order for fabrics to be considered sustainable, they must be made locally. The available materials used by the participating fashion professionals currently come from China or Europe and generate a large carbon footprint due to transportation emissions, in addition to their own manufacturing impact. This was seen as a barrier to sustainable production and also creates a time lag between ordering and delivery, which slow down production and creates a need to buy fabrics based on *anticipated* demand, rather than responding to *actual* demand. Excess fabric purchases therefore represent a problematic source of waste for Toronto designers, and under-purchased fabrics result in missed sales opportunities and slowed production speeds. Drennan pointed out that

. . . if we want to try and keep our footprint down, you know, as low as possible, manufacturing here in Toronto, we should be looking at fabric that can be made right here in Toronto.

As one online participant explained, this would also allow for rapid order replenishment. From a fast fashion perspective, this would also lead to a more agile supply chain and would imitate Zara's vertically integrated model. A localized textile industry would begin to address research

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question one regarding how to reconcile the contemporary consumer's desire for fast fashion with C2C (see Table 5).

Drennan offered particular insight into Toronto's textile production problem;

. . . we're seeing recycled polyester, recycled cotton . . . and we have the ability to do that. We can't grow cotton here, but we have the infrastructure to actually make that kind of fabric.

These recycled fabrics would enable a locally manufactured textile industry that could rapidly respond to designer needs while simultaneously addressing the issues of textile waste. One online questionnaire participant also noted that hemp can be grown in Canada, though the respondent also noted that this textile is not being manufactured at present. As per research question four, this barrier to sustainable production in the city is a result of lacking infrastructure to support a local textile industry. This is a missed business opportunity for textile manufacturers, a missed environmental awareness opportunity for the city, and a missed fast and sustainable opportunity for Toronto designers.

The second sub-theme arising from the data results describes responsible transportation channels and addresses research question two, which asks about the design, production, sourcing and transportation practices that would ensure eco-effectiveness according to the C2C model. All respondents agreed that making products geographically close to their sites of sale is ideal as the ecological footprint of each item would be reduced through lowered or non-existent transportation emissions. One respondent even suggested the use of public transportation or bicycles to turn local product deliveries into a viable and sustainable distribution channel, while longer distance shipments should be made by boats and trains according to three participants. This was seen as the most energy-efficient and least ecologically harmful method of travel. The drawback, however, is that these long-distance modes of transport increase the time to market,

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which goes counter to the quick distribution achieved through regularly scheduled air and truck transportation that is central to Zara's success. In the C2C model, given current technology, the second eco-effective step of following informed personal preferences should guide transportation decisions to reach more distant markets. C2C explains that manufacturers cannot wait until better technology is invented outside their own industries, as sustainable transportation solutions are still emergent, manufacturers must make the best choice available to them at the time. This preference must therefore be informed by which choice would best meet the needs of the business at the time: in this case, rapid time to market or lowered carbon foot-printing.

Regarding the third sub-theme of localized production, all respondents felt that the Toronto fashion market was not robust enough to support its current manufacturing capacity. This is a challenge faced by Toronto's apparel manufacturers, revealed by research question four, which investigates this new production model's challenges and how they can be overcome. The need to explore other, more distant markets makes the long-distance travelling of goods inevitable, despite respondents' consensus that sourcing and selling locally is ideal. Drennan suggested that other Canadian markets should be explored, such as Vancouver or Halifax, but did not acknowledge more geographically close (but international) markets such as New York or Boston. One online participant claimed that "in order for designers to make a living, they will have to sell in an international market," but did not specify which nations should be included. Completely localized production and sales is not seen as an option in Toronto due to low consumer demand, and this *could* be linked to fast fashion, as one online participant explains that

fast fashion has greatly impacted the contemporary Toronto fashion climate. Toronto fashion is consumed by quantity over quality. The fashion culture is obsessed with having the newest trend at the cheapest price.

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If offerings do not appeal to this demand then sales opportunities within Toronto are missed and designers will need to make those sales in more distant markets. However, according to the Zara model, local manufacturers have a better sense of what is trendy on the streets of their city and can use their consumers as inspiration for future product offerings. This data is put to use by Zara, as the company asks for daily trend reports not just from their designers but also from store staff, which allows them to make products that are oriented towards the consumers, thereby driving their sales results. Creating a more rapidly changing, trend-based product assortment (described in greater detail below), could create more demand for local products within the city (see Table 5).

Sustainability convenience and incentives.

Research questions three and four examined the necessary conditions and challenges facing fast and sustainable apparel production in Toronto. According to the participants, given the current garbage collection and recycling infrastructure in the city, the noble goal of creating products without waste and designing for complete reuse is not realistic. The identified wastes from apparel manufacturing that need to be controlled include: “. . . off cuts (fabric scraps left over from production cutting)/ fabric ends (excess fabric left over after production has been cut). . .” unsold stock, defective goods, post-consumer garments, inefficiently used energy, packaging waste, and effluents including used dye, wash and sewer water. In Drennan’s words:

one of the ways to get around dead stock is to just not produce as much, right. So that’s one of the big problems is, we’re just over-producing...

This demonstrates the need for a leaner production paradigm and is compatible with the fast fashion model presented here. By producing in smaller batches, Zara is able to reduce waste and limit lost resources, time and energy spent on getting unsuccessful styles to the sales floor. The

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opportunity of missed sales due to quantity reductions on popular styles is overcome by proximity and speed as stores can replenish popular items in as little as two weeks due to being more closely located to sites of European sales and having the agility within the supply chain to respond to last-minute international consumer demands through rapid transportation times. A two-week replenishment time frame was unanimously considered a best practice by all participants in Toronto (see Table 5). Reduction through lean and agile production does not go far enough to become compatible with eco-effective practices, however, so a truly effective solution must delve deeper.

Two participants suggested that waste could be turned into food or made an asset through recycling and efficient use/reuse, and land-fill diversion could be achieved through donations.

One online participant suggested that:

Should there be excess fabric waste it could be donated to designers who work on refurbished clothing or schools for craft projects. Unused stock could also be donated to designers making refurbished clothing or donated to local charities.

This system would not be entirely compatible with C2C though, because while community-based resource sharing touches on eco-effective steps one and two through the identification of known culprits (fabric waste) and following informed preferences (diverting waste from a landfill), but it does not reach further. Waste does not become regenerative abundance and is not always recycled eco-effectively as endlessly useful substances.

Implementing a no-waste process becomes possible in eco-effectiveness steps three and four of the C2C model and thus forms part of the long journey for Toronto's fashion industry. Step three requires industries to create a passive positive list, which requires actively engaging substances that are environmentally beneficial, or at least benign. Substances such as fabric scraps that are the wasteful by-products of other processes are *not* on of this list. By actively

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seeking to completely use the waste from other industrial processes, designers would also take the C2C model in Toronto to the fourth step, which puts the passive positive list into action. This goes further than off-cut sharing by putting seemingly unrelated industries in close proximity to use *their* wastes effectively. For example, the methane gas generated from food wastes by neighbouring restaurants could be capped and harnessed as energy to fuel local apparel manufacturing sewing machines. According to former Toronto Mayor David Miller, this practice is already used in Sao Paulo, which is home to the world's largest landfill (roughly the size of Toronto's downtown core). Energy harnessed from this fill provides for eight percent of Sao Paulo's electricity needs; 11 million tons of greenhouse gasses are being converted to a source of wealth (regenerative abundance) instead of waste and environmental degradation (Miller, 2012). These best practices are more in line with the organizing infrastructure of industrial ecology, which is described by Armstrong and LeHew as a continuous cycle of resources that "... puts unrelated industries in proximity to each other so they may collaborate to utilize each other's waste" (2011, p. 33).

According to one online participant, and in response to research question four, which investigates barriers to this regenerative abundance paradigm, "... political will/education and awareness" is an obstacle. This particular participant suggested the need for government intervention to make sharing the wealth of wastes possible. Toronto could, alternatively, emulate the European Union's model in this regard, where "... a changing legislative framework is forcing increasingly progressive recovery of textiles" (Fletcher, 2008, p. 99). By 2015, the goal is to collect all textiles separately from other wastes, enabling their recycling and reuse (Fletcher, 2008, p. 99). At present, no such system, initiative, or infrastructure exists in the city of Toronto, according to all four participants. In response to research question four, convenience and

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legislation is a barrier to the proper reuse and creation of regenerative abundance as described in the C2C model. In order for these best practices to be applied, their economic benefits must be made clear (see Table 5). For example, the use of capped methane as described by Miller would need to be initiated by the city *or* by informal business partnerships and community building. If this negotiation was informal, then it is presumable that the energy produced from the cap (after the initial costs of the technology were covered) would be free of charge to those who used it, representing an eventual economic incentive to use waste wisely.

The pace of apparel production.

Research question one examines the possibility of reconciling fast fashion with sustainability. All participants agreed that fast fashion production is environmentally and socially irresponsible, and defined the goods as “. . . cheap. . .” “. . . trend based. . .” and “. . . produced in [the selling] season. . .” However, while one participant felt that fast fashion had “. . . no effect. . .” on the Toronto fashion industry, the others felt that consumers have been impacted in such a way that they now expect a rapidly changing selection of inexpensive and on-trend goods. Drennan claims that fast fashion’s prevalence in Toronto’s retail climate has:

. . . made it more challenging to be a designer . . . especially [in] this economy [consumers] have a hard time justifying the expense of well-made, quality design garments, versus . . . [the] knock-off version for less. . . [she has seen many designers] closing their doors, going out of business, not being able to persevere through a lot of these challenges. . .

Despite this nearly universal agreement on the negative impact of fast fashion, all respondents also agreed that the timeline for new designs to be made available in stores should be shortened in Toronto. *Ideally*, new designs should be in stores one month after conception and replenishment should happen in two weeks, although the buying season availability of local raw material are seen as barriers to this pace. This data reveals a universal bias towards the term ‘fast

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fashion,’ but also demonstrates an innate belief in the positive effects of its agile supply chain model. When probed on the subject, Drennan herself agreed:

. . . if we can introduce more buying seasons – and by buying I mean retailers buying from distributors – then we could reduce the pressure to produce thirty samples . . . [and] provide fewer styles – let’s say five or six, instead of thirty – which would also enable us to maintain a continuous workforce . . . which could produce in a very steady capacity, instead of ebbs and flows, peaks and valleys.

Drennan feels the media is partially responsible for the two buying season paradigm and claims that “. . . fashion weeks international need to move away from that model . . . four [seasons] a year would even be great. Six times a year would be wonderful.” She is also supportive of designing merchandise to be available at retail locations during the season in which it is meant to be purchased and worn: “. . . fall/winter clothes shouldn’t be on the racks in August . . . that’s where it could potentially tighten up a bit. . .” This is more congruent with Zara’s model, although the specific term ‘fast fashion’ was not used by Drennan. This phrase’s stigma of being cheap and disposable could be one reason these best practices have not been investigated and applied. Despite this bias, by cohesively adapting fast and sustainable principals, a better product can emerge (see Table 5). As described by Fletcher (2008), contemporary consumers do not buy garments for continued, long-term wear, and items are rarely worn until they are threadbare. Instead, consumers simply get tired of their clothing and abandon them to stuffed closets and packed landfills or thrift shop racks (Fletcher, 2008, p. 165).

While the participants did not agree on durability expectations, there was a consensus among online participants that their expectations are heavily influenced by price. By favouring speed in production over quality of construction, as seen in the Zara example, eco-effectiveness step five- reinvention- can be put into action if sustainability principles are observed. Garments could be worn until consumers are bored with them, and they could then be re-absorbed into a

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regenerative and abundant system. This reinvention would produce a sustainable fast fashion product that could be returned for redesign after use (as suggested by Drennan), disassembled and completely recycled, or positively selected materials could biodegrade as fodder for local eco-systems.

Working conditions could also be positively selected for reinvention under this fast and sustainable paradigm, and Toronto apparel manufacturers can take advantage of in-season production and sales to reduce the ebbs and flows of manufacturing by increasing the number of seasons and making smaller quantities of products in each (see Table 5). One online participant cites having issues with sewing contractors to fulfill orders:

. . . they sometimes have problems finding sewing machine operators who are skilled enough to work during peak times as they cannot consistently offer work. . . If Toronto based designers/apparel manufacturers were to space out production of their product rather than producing two collections a year in two big rushes this would help facilitate a more consistent work schedule. It would also fall in line with current consumer expectations of fast fashion and an ever changing selection of goods (rather than putting everything out at the beginning of the season and then having nothing new arrive until the following season). Manufacturing facilities could hire contract workers. Contract workers could be sourced from their homes. Manufacturing companies could create partnerships with [local] design schools like Ryerson and George Brown in order to hire a workforce of young, emerging designers/workers for contract periods. Contract workers should be paid fair wages. . .

Another online participant described a similar process and explains that Toronto apparel producers “. . . must be innovative and market sensitive [and] would need to build education among consumers to make this work.” In response to research questions one, two and three (which investigate the specific conditions and practices necessary in Toronto to reconcile fast and sustainable fashion), there is the potential to reinvigorate the flailing fashion industry in the city of Toronto through a reinvention of apparel production practices that are consistent with sustainability *and* fast fashion. These practices can be consistent with a triple bottom line

approach and consider the environmental, social, and economic impacts (see Appendix J, Figures 1 and 2) and also reflect the framework originally proposed by this research (see Figure 1).

Conclusions

Four key themes emerged from primary data collection and analysis:

- 1) The need to build education and awareness in consumers and manufacturers through transparency and educational campaigns.
- 2) Fabrics and apparel must be produced locally to enable agile and lean production.
- 3) Sustainability convenience and incentives must be put in place by governing bodies to ensure the widespread adoption of best practices and the creation of regenerative abundance.
- 4) The pace of apparel production within the city must be more rapid to meet the demands of contemporary consumers.

Table 5 summarizes the correlation of these themes to Figure 1 and highlights the areas of best practices. This table also suggests there is potential for a reinvention of Toronto apparel manufacturing, which would be consistent with both fast fashion and C2C sustainability, although current normative practices are barriers to this model. The participants pointed to missing manufacturing and city infrastructure to support their vision of sustainability according to the four themes. These missing factors included textile recycling facilities and educational programs encouraging their use; government incentives for locally made sustainable apparel production and textile manufacturing; and the fashion industry's widespread adoption of shorter times from the design to retail phases. This was seen as limitation to this production paradigm in Toronto, and demonstrates the need for further investigation.

Limitations

The limitations to this research include potential biases, the opportunity for leading questions, the brevity of responses, and the choice of sample. First, there is a varying degree of potential bias in any research process. While biases tend to influence the topic of research, in this case, the sample may also have been influenced. The participants are primarily the researcher's personal contacts from existing professional and personal relationships. The opinions and thought processes of all parties involved (the researcher and the participants) have therefore been influenced prior to investigation. This research is also biased towards fashion professionals instead of experts (as defined in Table 3). It was determined by the researcher and research supervisor that Toronto fashion professionals would have a greater understanding of feasibly sustainable production than consultants as they are in constant engagement with physical practice. Toronto fashion professionals also engage with economic or triple bottom lines daily (see Appendix C, Figure 1), whereas sustainable fashion expert Kelly Drennan may be biased towards sustainability as she is not directly engaged with the physical production of apparel and does not reap the immediate economic rewards it provides. She is, however, responsible for consulting apparel manufacturers in achieving the triple bottom line, and thus still can be considered an authoritative resource in these three interrelated areas despite her potential bias.

The opportunity for leading questions is an inherent difficulty to studies in the sustainability field. Rudell acknowledges the prevalence of social desirability bias in which responses are affected by a respondent's desire to give the 'acceptable' or 'best' answer (2006, p. 285). This sentiment was echoed by Wutich and Gravlee (2010) as they explained that at times, those modelling a particular behaviour (in this case sustainable apparel production practices) may "... create a stylized depiction of reality that necessarily excludes some pieces of

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information and thus [their responses] cannot be purely data driven” (p. 204). While precautions were taken to avoid leading questions, it is acknowledged here as an unavoidable obstacle to any contentious or sustainability focused research. However, there was an attempt nonetheless to control this bias through questionnaire design, as practitioners and experts in the field were asked what they would *like* to see or what they felt is *best* instead of what they actually do (see Appendices E and F). The questionnaire could have been tested with a participant from another field to assess the leading potential of questions.

The brevity of responses by participants who completed the online questionnaire also provided less data than expected to analyze and is a limit of this research. Had the entire sample participated in a semi-structured interview, there would have been greater opportunities for probing questions, clarification and more thorough responses. An online format may also limit participant engagement as the length of time required to type thorough and thoughtful answers is far greater than the time needed to verbally express opinions. A pilot questionnaire could have also been administered to assess integrity before the full questionnaire was sent to participants.

Finally, the sample for this research was very small; ten apparel production businesses within the city were initially contacted but there was a very low response rate and only three questionnaires were fully completed. A larger sample size would have likely produced more diverse results. While a longer, more intensive study could prove useful, this was not the goal of this research; this document serves as exploratory research only and specific practices were not tested by the researcher. As such, this study does not fully test and confirm any practice’s viability, although efforts have been taken to ensure validity through inter-rater agreement. This investigation therefore demonstrates the need for further study.

Recommendations for Future Research

The results of the interviews and questionnaires were more general than what this research aimed to explore, although the research questions have been addressed. An investigation of what infrastructure is missing, and how it could be put in place is appropriate as the generalized results may be symptomatic of missing infrastructure within the city. Before specific solutions can be addressed, larger issues must be resolved in the minds of participants.

The lack of agreement among participants regarding terms, language and best practices outlines the need for a clearly defined sustainable apparel production paradigm. Intensive investigations that test practices, materials and production facilities could mitigate the need for companies to conduct internal testing, which is often prohibitively costly for independent businesses. This consensus building could incorporate top-down information sharing in which larger multi-national corporations share their best practices (which are normally considered proprietary) with smaller independent facilities. These best practices should be witnessed and reported on. While a more in-depth investigation of contemporary Toronto manufacturing practices may provide useful benchmarks, comparing these to the practices at larger facilities such as Inditex may also highlight room for improvement. This research also suggests the need to develop manufacturing technology that is compatible with a C2C framework of design and an investigation of textile production possibilities in Toronto is needed and both of these were acknowledged by the sample as being important to the topic under investigation, though they are beyond the scope of this research.

Appendix A: Canadian Apparel Imports and Prices

Figure 1. Canadian Imports of Apparel Manufactured in China. Reproduced from Industry Canada, 2011b, December 7.

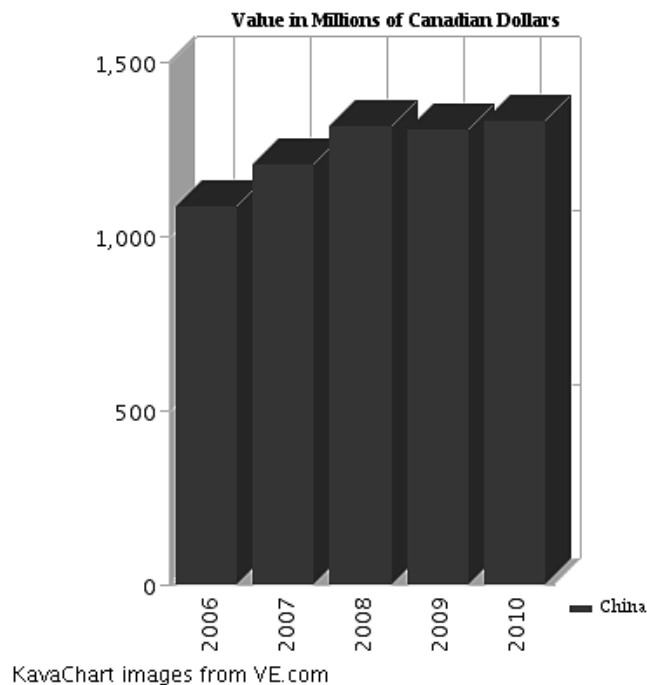
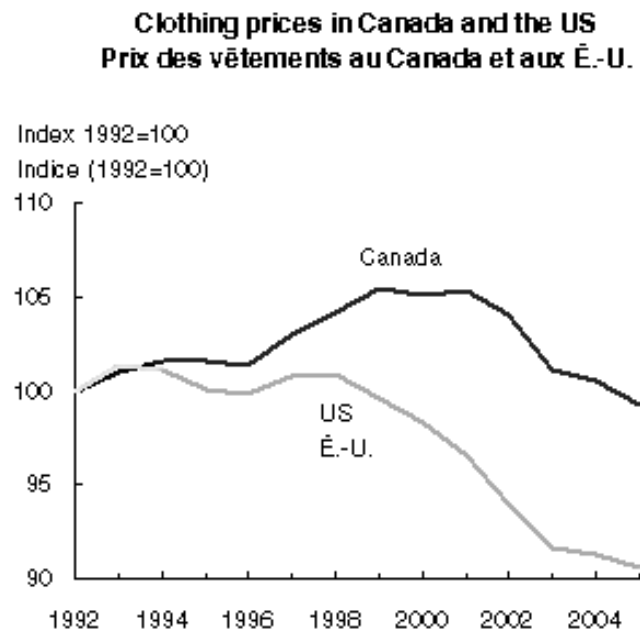


Figure 2. Clothing Prices in Canada and the US Between 1992 and 2004. Reproduced from Wyman, 2006.



Appendix B: Fast Fashion Product Development Cycle and Inditex's Carbon Strategy

Figure 1. The Fast Fashion Product Development Cycle. Reproduced from Doeringer & Crean, 2006, p. 372.

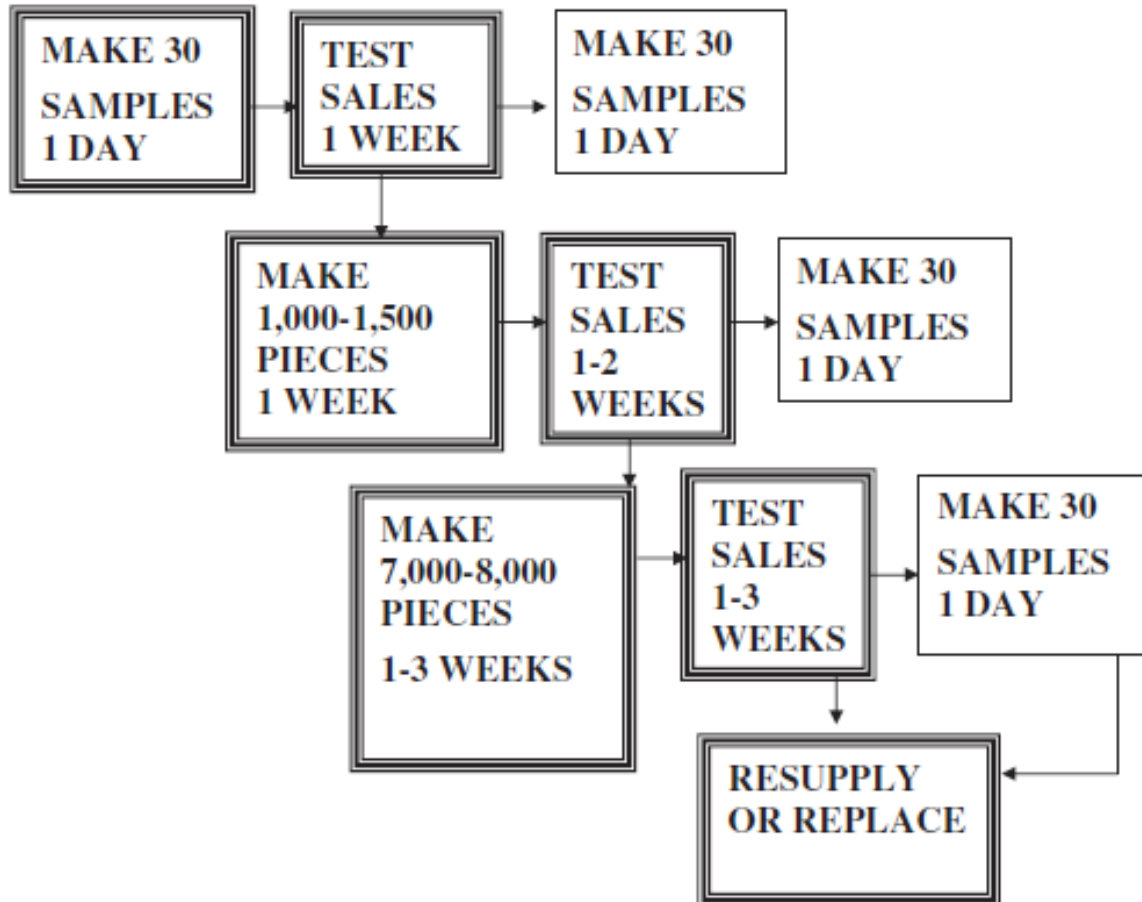


Figure 2. Inditex's Emission Reduction and Compensation Strategy. Reproduced from Inditex, n.d., p. 14.



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Figure 3. Total Energy Consumption by Year in Terajoules. Reproduced from Inditex, 2011, p. 138.

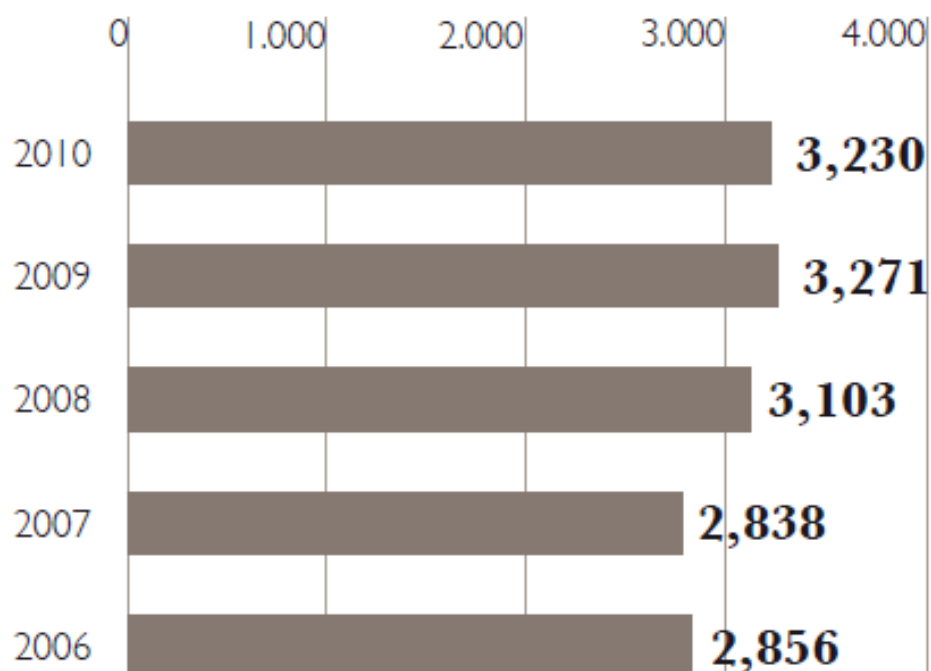
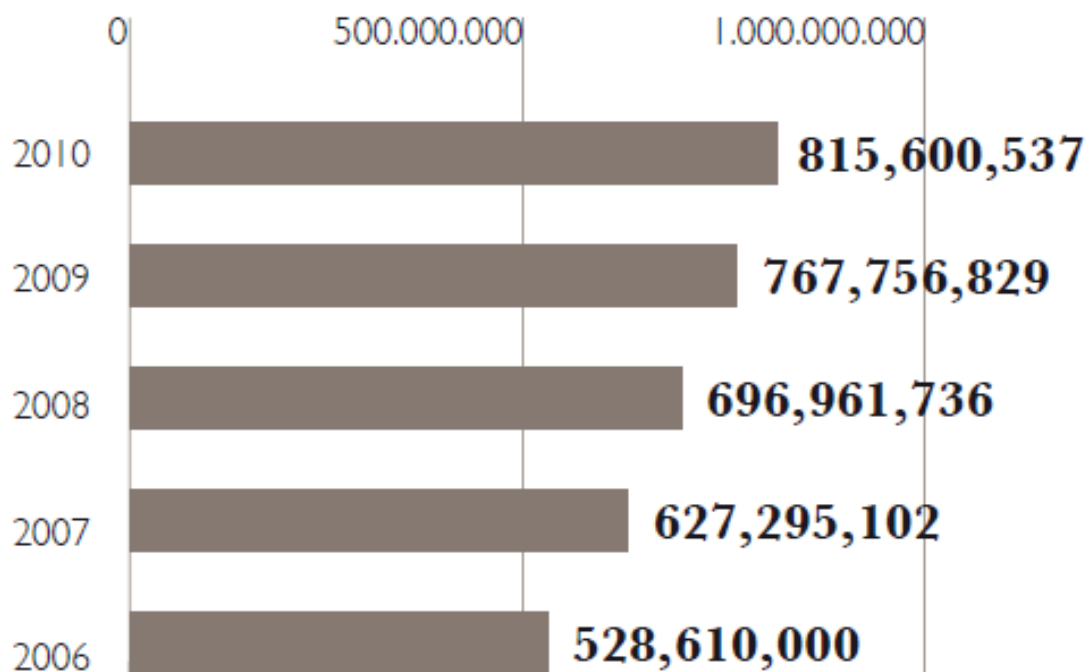


Figure 4. Number of Inditex Garments Released to the Market by Year. Reproduced from Inditex, 2011, p. 138.



Appendix C: The Triple Bottom Line

Figure 1. The Triple Bottom Line. Reproduced from Carter & Rogers, 2008, p. 365.

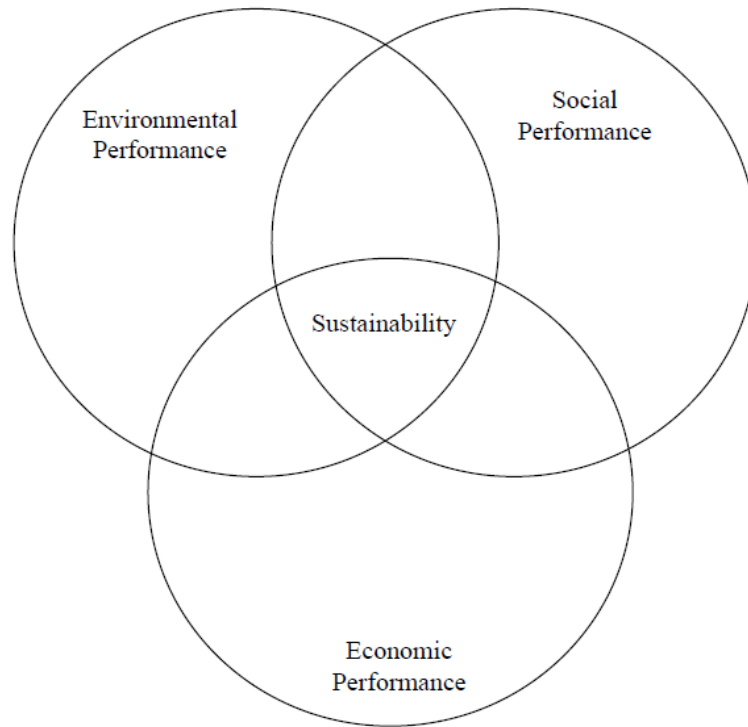
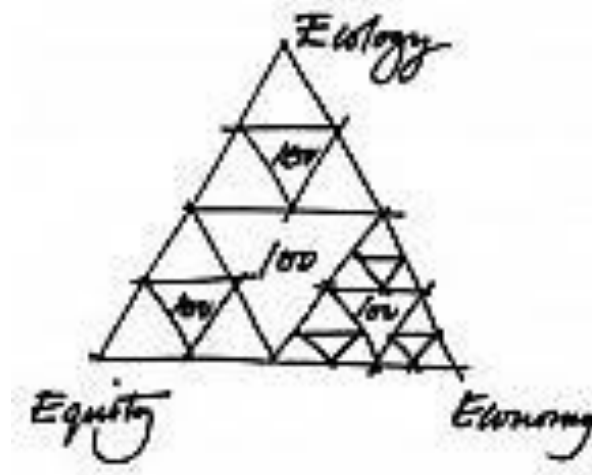


Figure 2. C2C Design Matrix and Fractal Tool. Reproduced from MBDC, n.d.

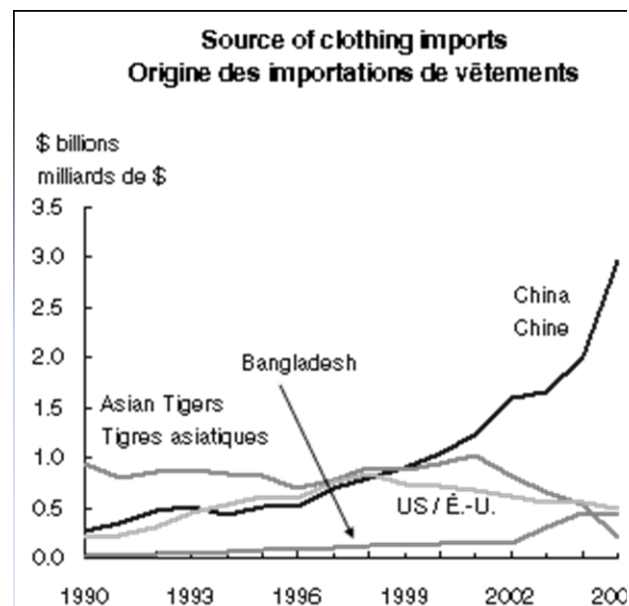


Appendix D: Canadian Apparel Manufacturing Employment and Imports

Figure 1. The Rise and Fall of Employment Rates in the Canadian Apparel Manufacturing Industry. Reproduced from Wyman, 2006.



Figure 2. Source of Canadian Clothing Imports from 1990 to 2005. Reproduced from Wyman, 2006.



Appendix E: Initial Interview Questions for Sustainable Fashion Expert

Sustainability

1. How do you define sustainable fashion?
 - a. According to your definition of sustainable fashion, would any one of those criteria qualify a garment as sustainable, or must the garments meet multiple criteria?
2. What geographic-specific considerations ensure sustainable fashion production here in Toronto?
3. What in your opinion and in your experience are the different categories of waste that would be produced by manufacturing clothing in Toronto?
 - a. of the different types of waste that you just highlighted, how do you think that those wastes could be eliminated, or possibly turned into assets in Toronto?
 - b. Do you think that there are any barriers to the practices you have suggested in Toronto, in particular?
 - c. How could those barriers be overcome?
4. What, in your opinion would be the best way to dispose of clothing at the end of their useful life; so either dead stock or after consumer use?
 - a. Do you think that there are any barriers that would need to be overcome before a solution like the one that you just suggested could be put in place?
 - b. How do you think a barrier like that could be overcome?

Sourcing

5. What types of fabrics would you suggest in terms of meeting your sustainability recommendations?
6. How far do you think raw materials should ideally travel before being used to manufacture garments in Toronto?
7. How far do you think that Toronto-made apparel products should ideally travel before being sold at retail locations?
 - a. If Toronto designers need to access distant but valuable consumer markets, what kind of transportation or distribution channels are the most sustainable in your opinion?

Social Responsibility

8. Do you feel that apparel manufacturing jobs in Toronto are fair and equitable for the employees?
9. How would you define a good workspace in Toronto for apparel manufacturing specifically?
 - a. Do you feel that there are enough of those spaces in Toronto?

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- b. How would an ideal workspace for apparel manufacture in Toronto integrate with the surrounding community?
 - c. How would an ideal workspace integrate with the existing urban landscape?
- 10. How do you feel that Toronto-based manufacturers can supply adequate labour for peaks and valleys in demand, while still being equitable?
 - a. What kind of barriers do you think are preventing us from keeping a steady flow of merchandise, instead of the current system where we have two primary buying seasons?

Fast Fashion

- 11. What do you think would be the ideal timeframe for Toronto fashion producers to be able to design and manufacture a new style?
 - a. Do you feel that this is a reasonable amount of time for a garment to be designed and then distributed?
 - b. So what kind of barriers or enablers do you think exist that make this timeframe the norm?
 - c. What kind of barriers do you think would need to be overcome to implement the ideal time frame you suggested?
- 12. How do you define fast fashion?
- 13. What do you think would be the ideal quality or lifespan expectation in a garment?
 - a. If a garment met your definition of sustainability and the cost of the garment was lower, but durability was also lower, would you still be satisfied with that product's sustainability claims?
- 14. What do you feel has been fast fashion's impact on the contemporary Toronto fashion climate?

Appendix F: Online Questionnaire and Explanation of Procedure

Explanation of Procedure

This questionnaire should take approximately 30 minutes to complete, depending on the level of detail you choose to include. Please be as detailed and honest as possible as this research is aimed at getting a professional perspective on the specific techniques that could be used to manufacture sustainable fast-fashion apparel in Toronto. The more detail you provide, the more valid and useful the research results will be; however questions within this survey may be left blank if they do not apply to you or you do not wish to answer them for any reason.

This questionnaire will request detailed answers about your professional opinions and will not ask about specific production practices used in your facilities. You may, however, choose to use your own techniques as examples of how your opinions have been put into practice or to explain results you have seen first-hand. Please use this as a forum for ‘big-picture thinking’ as this research is in search of ‘best-practices’ (a method or technique that has consistently shown results superior to those achieved with other means). These practices may or may not be grounded in the current reality of Toronto apparel manufacturing. For example, if an emerging technology could improve the environmental impact of apparel production but is not currently available in Toronto, please describe this technology regardless of availability.

It is the ultimate goal of this research to provide an accessible document which Toronto apparel manufacturers can use in their journey towards sustainable, equitable, and financially successful production practices. Your identity will not be linked with the questionnaire data but will be assigned a code which is known only to the researcher, Sarah Portway.

Questionnaire

Sustainability.

- 1) How do you define sustainable apparel?
 - a) Are there a specific number of criteria which must be met in order to be considered ‘sustainable’ according to your definition?
- 2) Are there any geographically unique or particular conditions necessary to ensure sustainable apparel design and manufacturing practices in Toronto?
 - a) What, if any, barriers must be overcome before these practices can be put into use? (i.e. geographic, social, ecological, economic, etc.)
 - b) If barriers exist, how do you think these could be overcome?
- 3) What are the different categories of waste produced by manufacturing clothing in Toronto? (i.e. fabric wastes, ‘dead’ stock, labour wastes, energy, etc.)
 - a) How do you think wastes could be eliminated and/or turned into an asset in Toronto?
 - b) What, if any, barriers must be overcome before these expectations can be met? (i.e. geographic, social, ecological, economic, etc.)
 - c) If barriers exist, how do you think these could be overcome?

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- 4) What, in your opinion, is the best way to dispose of clothing at the end of their useful life in Toronto (post-consumer disposal)?
 - a) Why?
 - b) What, if any, barriers must be overcome before these expectations can be met? (i.e. geographic, social, ecological, economic, etc.)
 - c) If barriers exist, how do you think these could be overcome?

Sourcing.

- 5) What fabrics should ideally be used for manufacturing sustainable apparel in Toronto?
 - a) What, if any, barriers must be overcome before these practices can be put into use? (i.e. geographic, social, ecological, economic, etc.)
 - b) If barriers exist, how do you think these could be overcome?
- 6) How far do raw materials currently travel before being used to manufacture garments in Toronto?
 - a) Is this ideal or do you have suggestions to make this system more sustainable?
 - b) What, if any, barriers must be overcome before these practices can be put into use? (i.e. geographic, social, ecological, economic, etc.)
 - c) If barriers exist, how do you think these could be overcome?
- 7) How far do finished garments typically travel after manufacture to their points of sale?
 - a) Is this ideal or do you have suggestions to make this system more sustainable?
 - b) Do you feel that designers must sell their items on an international market to create a healthy profit, or is the market in Toronto large enough to sustain local designers?
 - c) What is the best method or vehicle of travel according to your definition of sustainability?
 - d) What, if any, barriers must be overcome before these practices can be put into use? (i.e. geographic, social, ecological, economic, etc.)
 - e) If barriers exist, how do you think these could be overcome?

Social Responsibility.

- 8) Do you feel that apparel manufacturing jobs in Toronto are fair and equitable for employees?
 - a) What, if any, barriers must be overcome before better practices can be put into use? (i.e. geographic, social, ecological, economic, etc.)
 - b) If barriers exist, how do you think these could be overcome?
- 9) How do you define a safe and comfortable apparel production space for Toronto production? (i.e. what does it look, smell, or sound like, etc.)
 - a) How does it integrate with the surrounding community?
 - b) How does it integrate with the surrounding landscape?

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- c) What, if any, barriers must be overcome before these practices can be put into use? (i.e. geographic, social, ecological, economic, etc.)
- d) If barriers exist, how do you think these could be overcome?

10) How can Toronto apparel manufacturers ideally ensure adequate labour for peaks in manufacturing demand (such as seasonal rushes, etc.) while still treating employees equitably?

- a) What, if any, barriers must be overcome before these practices can be put into use? (i.e. geographic, social, ecological, economic, etc.)
- b) If barriers exist, how do you think these could be overcome?

Fast Fashion.

11) What is the ideal time frame that you think Toronto fashion producers should be able to design and manufacture a new style?

- a) What is the ideal time frame to replenish a popular design?
- b) What barriers/enablers currently exist that prevent/ensure this time frame? (i.e. geographic, social, ecological, economic, etc.)
- c) If barriers exist, how do you think these could be overcome?

12) Describe your ideal quality and durability expectations in a garment.

- a) Are your expectations influenced by price, country of origin, speed of production, or other external circumstances?
- b) What kind of production practices must be put in place before these expectations can be met?

13) How do you define fast-fashion?

14) What do you feel is fast fashion's impact on the contemporary Toronto fashion climate?

Appendix G: Ryerson Research and Ethics Board Letter of Approval



To: Sarah Portway
FCAD - Fashion
Re: REB 2011-301: Fast and Sustainable Fashion: An Ideal Model for Toronto Fashion
Supply-Chains
Date: November 4, 2011

Dear Sarah Portway,

The review of your protocol REB File REB 2011-301 is now complete. The project has been approved for a one year period. Please note that before proceeding with your project, compliance with other required University approvals/certifications, institutional requirements, or governmental authorizations may be required.

This approval may be extended after one year upon request. Please be advised that if the project is not renewed, approval will expire and no more research involving humans may take place. If this is a funded project, access to research funds may also be affected.

Please note that REB approval policies require that you adhere strictly to the protocol as last reviewed by the REB and that any modifications must be approved by the Board before they can be implemented. Adverse or unexpected events must be reported to the REB as soon as possible with an indication from the Principal Investigator as to how, in the view of the Principal Investigator, these events affect the continuation of the protocol.

Finally, if research subjects are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research.

Please quote your REB file number (REB 2011-301) on future correspondence.

Congratulations and best of luck in conducting your research.

A handwritten signature in black ink, appearing to read "Nancy Walton". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Nancy Walton, Ph.D.
Chair, Research Ethics Board

Appendix H: Initial Contact Letter Requesting Kelly Drennan's Participation

Hi Kelly,

I was hoping you could agree to let me interview you for my Thesis work. As you may remember, I am working on a project which brings together a Cradle-to-Cradle model of sustainability, fast-fashion principals as modeled by Zara, and localized small scale production. The results of my two years research will be a document which could be used by Toronto fashion manufacturers as a 'best-practices' guide to generate a triple-bottom-line of success for their business. The supply chain model should be considered as a long-term goal - not all of the practices suggested by my research are immediately available to local business due to infrastructure challenges as well as technology and textile availability. It should be seen as a bench-mark goal which can be implemented in small steps that allow the reader/business to make clear and measurable strides towards harmony with local Toronto eco-systems, economic industries, and culture.

I am hoping to interview you, and bounce a few ideas of you in preparation for an online questionnaire which I will distribute electronically to local fashion manufacturers. You are the only full interview, and I was hoping you would allow me to disclose your identity within the resulting paper. Yours is the only identity I am requesting to disclose as I would like to cite you directly and feature Fashion Takes Action as a professional resource to Toronto fashion manufacturers. I will not include personal details, but only information about you from the FTA website and the interview. The interview should take about an hour or less, depending on the complexity and length of answers you chose to provide. I was hoping to complete the interview anytime within the next month and a half (ideally before January 11th).

I have attached my Research and Ethics Board approval, as well as a letter of consent for you perusal. I will, of course, bring a hard-copy of this letter to the interview for your signature, should you accept my request. This is highlighted with the letter, but I feel it is worth special mention you and I have some auxiliary agreements (i.e. Biz Camp) that could be a factor; your refusal to participate in the interview process will not adversely affect your relationship with me, Ryerson University, or any other party involved in the research in any capacity. Any existing agreements between Fashion Takes Action and me are considered separate and independent of this research project - professionalism is extremely important to me, my research supervisor, and Ryerson.

Thank you very much for your valuable time and consideration Kelly, I hope to get together with you soon!

Take care.

Appendix I: Letter of Consent and Authorization to Disclose Identity

Dear Participant,

Before agreeing to participate in this research, we strongly encourage you to read the following explanation of this study. This statement describes the purpose and procedures of the study. Also described is your right to withdraw from the study at any time. This study was approved by the Research Ethics Board of Ryerson University on November 3rd 2011.

Researcher: Sarah Portway, Graduate Student, Ryerson University, School of Fashion, Faculty of Communication & Design.

Research Supervisor: Tasha Lewis, PhD, Assistant Professor, Ryerson University, School of Fashion, Faculty of Communication & Design.

Study Title: Fast and Sustainable Fashion: An Ideal Model for Toronto Fashion Supply-Chains

Explanation of Procedures

This study examines Toronto apparel manufacturing in relation to sustainability, speed, and agility, to determine the best-practices. These best-practices will be used to develop a supply-chain model that could be put into use by Toronto designers wanting to incorporate these core values into their business.

Participation in this study involves completion of an interview which will request information specific to your opinions about best-practices. The topics covered include production, design, and transportation methods specific to fashion businesses base in the Toronto area. The interview will last less than one hour, but will vary depending on the depth and length of the answers provided. The interview will be in private at a location and time of your choosing, but will be digitally recorded and later transcribed for the purpose of data analysis. These transcripts will be analyzed for recurring themes and ‘best-practices’ by the researcher (Sarah Portway) and research supervisor (Dr. Tasha Lewis). Only the researcher and research supervisor will have access to the transcripts. The un-edited results can be made available to you by e-mail request and you will retain the right to strike any comments from the records as needed.

Potential Risks and Benefits

Potential risks include only the academic dissemination of information related to your opinions about production techniques within your facility. The potential benefits include an increase in the transparency of your business and voluntary participation in sustainable, solutions-based, fashion research.

Confidentiality

The information gathered during this study will remain confidential in a password protected computer for the duration of this study. Only the researcher and research supervisor will have access to the study data and information. Raw interview data will be coded to conceal identity within the files. Your identity and business name will be revealed in the resulting research paper. This is for the purposes of validity as you have been selected as an expert in this

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field and the use of your identity is therefore integral to the research design. Disclosure of identity has the additional benefit of allowing the audience of this research to contact you or cite you, should they wish to implement or re-present your suggestions.

The results of these interviews will be analyzed and re-presented through the lens of the researcher (i.e. they will be edited in some form). The results of the research will be published in the form of a research paper and may be published in a professional journal or presented at professional meetings. It may also be published in book form. The digital files of all interviews will be retained only by the researcher for professional purposes only on a password protected computer upon completion of this study. Data may be used in further studies with full consent and disclosure to the participants concerned.

Withdrawal without Prejudice

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University or the researchers. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty. Additionally, you may request not to have your identity revealed. Please contact the researcher in this event and a revised letter of consent will be supplied which does not allow for the disclosure of your identity. At any particular point in the study, you may refuse to answer any particular question or stop participation altogether.

Further Questions and Follow-Up

If you have any questions, please do not hesitate to ask at any time. You are also welcome to ask the researchers any questions that occur to you during the interview. If you have further questions once the interview is completed, you are encouraged to contact the researchers using the contact information given below.

Researcher:
Sarah Portway
Graduate Student
Ryerson University
School of Fashion
Faculty of Communication & Design
350 Victoria Street
Toronto, ON M5B 2K3
647.832.0132

Research Supervisor:
Tasha Lewis, PhD
Assistant Professor
Ryerson University
School of Fashion
Faculty of Communication & Design
350 Victoria Street
Toronto, ON M5B 2K3
416.979.5000 x 4843
416.979.5227

If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

Research Ethics Board
c/o Office of the Vice President, Research and Innovation
Ryerson University
350 Victoria Street
Toronto, ON M5B 2K3
416-979-5042

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I, _____ (name; please print clearly), have read the above information. I freely agree to participate in this study. I understand that I am free to refuse to answer any question and to withdraw from the study at any time. I understand that my responses will be shared with the research supervisor and edited by the researcher for the purposes of analysis and publication. I understand that my identity and business affiliation will be disclosed within the resulting academic paper. I will have the opportunity to review, edit, or revoke my comments before use in this research.

Participant Signature

Date

Appendix J: Initial Contact E-mail Sent to Toronto Fashion Professionals for Online Questionnaire Participation

Hello,

My name is Sarah Portway. I am a Fashion MA and part-time instructor at Ryerson University. My work is deeply involved with sustainable apparel manufacturing in Toronto and [your business] has been on my research 'radar' (so to speak) for some time. I was hoping you may be interested in participating in a survey I have created online. The survey will take approximately 30 minutes depending on the depth of your answers - the more thorough your answers, the more helpful my results will be. The survey is completely anonymous and Thieves will remain un-named the resulting paper.

More specifically, I am working on a research paper aimed at determining a 'best-practices' model of sustainability for apparel production here in Toronto. I hope to create a venue for big-picture thinking and I am not requesting information about your specific business practices, but I am looking for your professional opinions about sustainable production - these may or may not be rooted in the current realities of Toronto apparel manufacturing. I am looking at a variety of categories, including (but not limited to) fabric selection, design practices, ethical labour concerns, and post-consumer disposal/re-use.

If you are willing to participate, I will send you a very 'official' letter of invitation (for Ryerson Research and Ethics Board purposes) which includes a link to the survey and authentication password. There is also more information about my work in this letter and exactly what is requested of you.

Thank you very much for your time and consideration, I look forward to your reply.

N.B.

This research is supported by the Social Sciences and Humanities Research Council.

Appendix K: Online Consent Form to Participate in Electronic Questionnaire

Dear Participant,

Before agreeing to participate in this research, we strongly encourage you to read the following explanation of this study. This statement describes the purpose and procedures of the study. Also described is your right to withdraw from the study at any time. This study was approved by the Research Ethics Board of Ryerson University on November 3rd 2011.

Researcher: Sarah Portway, Graduate Student, Ryerson University, School of Fashion, Faculty of Communication & Design.

Research Supervisor: Tasha Lewis, PhD, Assistant Professor, Ryerson University, School of Fashion, Faculty of Communication & Design.

Study Title: Fast and Sustainable Fashion: An Ideal Model for Toronto Fashion Supply-Chains

Explanation of Procedures

This study examines Toronto apparel manufacturing in relation to sustainability, speed, and agility, to determine the best-practices. These best-practices will be used to develop a supply-chain model that could be put into use by Toronto designers wanting to incorporate these core values into their business.

Participation in this study involves completion of an online questionnaire which will request information specific to the production, design, and transportation methods of your fashion business. The questionnaire will take approximately 30 minutes to complete, but this will vary depending on the depth and length of the answers provided. The results of the questionnaire will be analyzed for recurring themes and ‘best-practices’ by the researcher (Sarah Portway) and research supervisor (Dr. Tasha Lewis). Only the researcher and research supervisor will have access to the un-edited responses and these can also be made available to you by e-mail request. You will retain the right to strike any comments from the records as needed.

Potential Risks and Benefits

Potential risks include only the academic dissemination of information related to production techniques within your facility. The potential benefits include an increase in the transparency of your business and participation in sustainable, solutions-based, fashion research.

Confidentiality

The information gathered during this study will remain confidential in a password protected computer for the duration of this study. Only the researcher and research supervisor will have access to the study data and information. You may be requested for permission to use your name and/or business affiliation in future publications that result from this study. This request will come in writing and will be accompanied by a full transcript of your questionnaire which you can read, edit, or revoke before consenting. The results of these questionnaires will be analyzed and re-presented through the lens of the researcher (i.e. they will be edited in some form). The results of the research will be published in the form of an academic paper and may be published in a professional journal, book, or presented at professional meetings. The digital files

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of all responses will be retained by the researcher (Sarah Portway), and may be used for professional purposes only, and will be kept on a password protected computer upon completion of this study. Data may be used in further studies with full consent and disclosure to the participants concerned.

Withdrawal without Prejudice

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University or the researchers. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty.

At any particular point in the study, you may refuse to answer any particular question or if you do not wish to participate you may exit the survey at any time by closing your browser.

Further Questions and Follow-Up

If you have any questions, please do not hesitate to ask at any time by e-mail or by phone. You are also welcome to ask the researchers any questions that occur to you during your completion of the questionnaire. If you have further questions once the questionnaire is completed, you are encouraged to contact the researchers using the contact information given below.

Researcher:
Sarah Portway Researcher:
Sarah Portway
Graduate Student
Ryerson University
School of Fashion
Faculty of Communication & Design
350 Victoria Street
Toronto, ON M5B 2K3
647.832.0132

Research Supervisor:
Tasha Lewis, PhD
Assistant Professor
Ryerson University
School of Fashion
Faculty of Communication & Design
350 Victoria Street
Toronto, ON M5B 2K3
416.979.5000 x 4843
416.979.5227

If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

Research Ethics Board
c/o Office of the Vice President, Research and Innovation
Ryerson University
350 Victoria Street
Toronto, ON M5B 2K3
416-979-5042

By clicking on the link below you are indicating that you have read and understand the consent information and are indicating your agreement to participate in the research project.

(Link was provided in original electronic document sent to participants)

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