

The Proposal

Sustainable Fashion:

The Development and Construction of Sustainable Adjustable Clothes for Growing Children.

Be-Artha Petersen

BTECH: Fashion Design

Submitted in partial fulfilment of the requirements for the

Baccalaureus Technologiae in Fashion Design

Department of Fashion Design

Faculty of Informatics and Design,

Cape Peninsula University of Technology

April 2010

Supervisor: Avryl Dahl and Alletia Chistin

Co-supervisors: Bryan Ramilkilawan, Maryna Bezuidenhout and Karen Suskin

TABLE OF CONTENTS:

Table of Contents

1	Introduction	2
1.1	Key basic terms and concepts.	2
1.2	Statement of the Research Problem.	2
2.	Research Design	4
	Research Question	4
3.	Literature Review/ Conceptual Framework	5
4.	Research Design/ Methodology	7
5.	Delineation of Research	9
6.	Significance of Research	9
7.	Expected Outcomes, Results and Contributions of the Research.	9
8.	Summary	10
	LIST OF REFERENCES	10

Field: Sustainable Fashion

Title: The Development and Construction of Sustainable Adjustable Clothes for Growing Children.

1 Introduction

1.1 Key basic terms and concepts.

Adjustable – To adapt to new or different conditions or to make correspondent or conformable.

Slow Design- : "The mindset that decelerates the velocity of design, production and consumption." Van Dyke Lewis PH.

Sustainable – "To take out the same amount of energy and resources that you put in to a system, with no pollution or waste." Yvon Chouinard

Sustainability is the minimum use of natural resources that include the environmental, social and ecological resources. The fewer raw materials we as a society consume the more these resources will be spared.

Fast Fashion - "The excess production and consumption of clothes that is fuelled by ever changing trends and fads". Van Dyke Lewis PH

1.2 Statement of the Research Problem.

Due to the rapid growth rate of children, parents are faced with purchasing new garments every season, usually before the clothes have reached its maximum wear. This practice is not only wasteful financially but also lends a hand to the environmental problems, caused by the mass consumption that is predominant within contemporary society.

1.1 Background to the Research Problem

The Setting

Children grow at exponential rates and the implications thereof are that children outgrow their clothes in a matter of months (approximately 12 months) and as a result of this, parents are constantly replacing garments that no longer fit the child- Lengthwise.

Children's clothes are an expense born by many households across the country and the globe. As children are constantly growing, at a rate ranging from 5 to 8 centimetres per year from birth to adolescence. Parents are faced with the expense of replacing garments before they have reached its maximum wear ability. This fact is continually tried and tested as traditionally; parents have been handing down outgrown clothes to younger children for generations. This in general proves that children outgrow their clothes long before the garments have reached its maximum wearing potential, as the garments are in a good enough condition to be worn by another child thereafter. This process of handing down outgrown clothes is due to the fact that children's clothes are produced with strong, durable and good quality fabrics that are designed to withstand the wear and tear generally experienced with children (Aldrich, 1989:5). However, this is rarely tested as children out grow the clothes before it becomes worn. Through informal interviews with parents of young, growing children I have found that parents have a solution to this problem: by handing down out grown garments to younger children within or outside the immediate family or through donating outgrown items to charity. This system is good for reusing out grown items, but what does the constant replacing of clothes do for the household expenses?

The children's clothes industry is booming. Parents are presented with many more purchasing options for children's fashion that includes popular retail stores (Woolworths, Edgars), major brand names (Guess Kids and Gap Kids), and the emergence of specialized children's boutique stores (Pumpkin Patch and Naartjie) country wide. This proves that children's fashion is in high demand and with high demand comes price. In store visits carried out by my

Not only does the procurement of short life garments leave a dent in consumer wallets, it also contributes to the contemporary consumer habit of continually acquiring new fashions and discarding items which is mass/ overconsumption. Overconsumption is the consumption or attainment of unnecessary consumables, which in this case is clothing, that are not needed but merely wanted for the sake of fashion-ability.

Another option would be to dispose of the clothes which would be the easiest option, and is the most hazardous to the environment. The clothes consumers no longer have use for, usually gets sent to second hand stores, given to goodwill or are handed down but a majority of discarded items more often than not end up in landfills. Clothing and textile products usually take a long time to degenerate. In doing so it releases hazardous toxins into the earth causing immense damage to the environment (Hethorn et al, 2008:186).

Contribute growing awareness to living sustainably - designers and manufactures are looking to innovative and alternative design solutions to combat the issues of waste, overconsumption and the pollution it causes.

2. Research Design

Research Question

Can the adjustment, children's clothes, according to their natural growth , contribute to a more sustainable pattern of consumption in contemporary society?

Sub-Question 1

Why is there a need to extend the lifespan of children's clothing?

Sub- Question 2

What sustainable solutions are in place to increase the lifespan of clothing and reduce waste and overconsumption?

Sub-Question 3

How can the lifespan of children's clothing be extended for longer wear?

3. Literature Review/ Conceptual Framework

Society today is becoming increasingly aware of what is happening environmentally, socially and ecologically. Designers, architects, engineers, as well as industry users are driven towards a new found goal- and that goal is; to help society head for a more sustainable lifestyle (Hart, 1997:71).

Designers are being called upon to "design for sustainability", to create more sustainable clothes through innovation and technology, adopting a greener approach to design and manufacture (Strauss & Fraud Luke, 2008).

Sustainability is rapidly becoming the driving force with an increased amount of designers who are finding new ways of designing products without the environmental, ecological and social burden that product consumption has on the planet. Designers are striving to produce goods that have less impact environment, (through pollution, excessive waste, carbon emissions and depleting natural resources), and in keeping with this i hope to produce a more sustainable product that will result, possibly in reducing consumption (Hethorn et al, 2008: xix).

According to Strauss & Faud Luke, co writers of *The Slow design Principles: A new interrogative and reflexive tool for design research and practice*, 2002, Slow Fashion /Design is a reaction to the mass consumption of clothes and textiles sparked by the Industrial revolution. As a result clothes has become increasingly cheaper due to mass production and low labour costs sourced from developing countries, thus making fashion clothes more affordable and accessible. Consumers are consuming vast amounts of clothes per year due to rapidly changing fashions and trends. The fashion industry is responsible for this ever growing need to consume copious amounts of clothes dictated to the masses via media, celebrity, film and music (Chapman & Gant, 2007:119).

In recent years the clothes and textile industries are becoming increasingly aware of the impact that the mass production of clothes and apparel industry has on the environment and has

improved technology to find solutions to the pollution and waste it is causing (Chapman & Gant, 2007). Similarly, innovative designers are creating garments that tackle these issues.

Sustainable fashion focuses on designing for longer wear, recyclable, interchangeable, quality clothes that has the least impact on the environment during the products full life cycle, from the production of the fibres to the disposal and decomposition of the product (Hart, 2007:71). It focuses on pairing fashion with awareness and responsibility for the environment, ecosystems, the workers and communities. It encourages creativity and innovation, quality and long life products that are appreciated and enjoyed (Fletcher, 2008:119).

A way to achieve sustainable fashion is to design products for extended use through the introduction of quality based, high value products that are interchangeable, adjustable, reusable and recyclable. This can be achieved through various methods of design (Fletcher, 2008:119).

Designing interchangeable garments that can be converted into another style or silhouette, or designing adjustable garments, using technology, advanced pattern making and construction, or producing recyclable garments reduces the amount of clothes consumed by the population. This in turn will reduce waste and cause less impact on the environment. (Fletcher, 2008:119). And not only will this initiative help preserve our natural resources but will eventually in the long run, through the implementation of new technology be more economical (Hart, 1997:71). The action of re-use and recycling and long- life products will lighten the load of household expenses and the accumulation of waste products (Fletcher, 2008:121).

Designers are now challenged with a new design brief that not only encompasses designing for functionality, aesthetics, and purpose, but designing for sustainability (Strauss & Faud Luke, 2008). Research conducted on the internet suggests that many initiatives have been undertaken by fashion designers to find solutions to achieve sustainable fashion. Many designers have opted to design garments that are made of 100% natural, biodegradable materials that can easily decompose and even be recycled. Others opt for recycling synthetic fibres to be melted down and reused in other industries. Many retailers have become involved in the initiative of opening second hand stores and departments in which unwanted garments can be returned to the store and are sold at a discount rate.

An initiative found online, Growables website, founded by designer, mother and owner of the internet clothing company, Tiki Gauaghler, who designs a range of adjustable children's clothes. Her design inspiration stems from the constant need to purchase new clothes for her constantly growing children. She designed a range of girls and boys reversible adjustable clothes, though her focus was more on the constraints on household budgets than that of sustainability. She does however offer an exchange program where parents have the option to buy and sell pre-loved clothes via the website, bringing the reuse issue to light (Gauaghler, 2008).

These initiatives undertaken by designers, manufactures and community are put in to practice to create a more sustainable lifestyle and environment. "The key to change is to ensure that the government, industry and consumers work together to achieve a more sustainable clothing and textile industry" (Allwood, Laursen et al., 2006). Designing clothes for longer use by adjusting, recycling, and selling second hand falls into this paradigm. Using this concept I will endeavour to produce a range of clothing for children, that is adjustable according to their natural growth that will contribute towards sustainable fashion (Hethorn et al, 2008: 49).

4. Research Design/ Methodology

Through the use of children's size charts, (addendum A), I found that children s grow relatively fast in length, approximately 5 – 6 cm per year, though they only grow about 2cm around the waist during the same time. With only such a small amount of growth around the waist and such a large number in length, it would be safe to assume that children mainly experience growth lengthwise, while their girth remains relatively the same. This would mean that if it were not for the drastic increase in length the trousers would fit the child for a longer period. Waist increase is minimal and there are already children's garments that exist where the waistbands are adjustable, but what of the length?

I have found a solution to this problem. I intend on exploring methods of adjusting trouser and sleeve lengths through the adding of carefully hidden panels and allow for the slight adjustment at the waist and shoulders. This will enable longer wear of garments.

The range will need to address the sustainability concept of reuse, recycle and creating long life clothing items. I will attempt to achieve this through the use of an on-line second hand clothes exchange program where the customers will be able to buy and sell second-hand items. The fabrics used will need to be either 100% recyclable or natural, to accommodate sourcing if the garments are to be recycled. This will address sub question 2, which is: What sustainable solutions are in place to increase the lifespan of clothing and reduce waste and overconsumption?

The longer life issue will be addressed through the insertion of carefully placed extension panels that will allow the adaptation of lengths according to the child's growth. The product will be made fashionable through the addition of generic interchangeable motifs, badges and add-ons that will be made according to the latest seasonal trends in children's wear. This will prevent garments becoming old fashioned and outdated and will keep both the parent and child involved and satisfied.

The method of research will include an investigation into how much children grow per year, using children's size analysis charts, found in patternmaking and grading textbooks, as well as retail children's wear sizes. This information will enable me to establish roughly by how much the garments have to be lengthened by to enable the child to wear it for a prolonged period of time.

Secondly I will conduct surveys, which are to be completed by parents who are located in the Cape Town area, who have children between the ages of 4 and 7 years old. These surveys will be conducted to outline problems faced by parents due to the rapid outgrowth of the children's clothes, pricing, styling and quality standards. It will ascertain whether parents experience their children outgrowing garments and whether it poses as a problem for them. It will also highlight whether the clothes are in a wearable condition after the children have out grown them.

Thirdly I will research children's wear patternmaking and construction along with grading to ensure proper fit, proportions and adjustment methods that does not impose any harm or discomfort to the children or the overall aesthetics of the garment.

I will then find good quality fabrics and trims that are sustainable, not harmful to the environment, and completely recyclable. Included with my product I aim to create awareness on preserving our environment and sustainable habits. I shall do this through labelling, swing tags explaining sustainability and what consumers can do to support this lifestyle. These mediums will inform the customer of the possibilities after they have used the product, such as recycling, and second hand possibilities.

5. Delineation of Research

This project will have a main focus on boy's outerwear clothing, ranging from the age of 4 to 7 years old. This is due to the fact that children between these ages experience a considerable amount of growth in height, though they have less growth in the width. The reasons for designing an outerwear range is because outerwear garments, such as jackets and jeans, are much harder wearing than casual clothing such as t-shirts, shirts and shorts. I will however, include casual garments into the range to tie the range up and complete it.

6. Significance of Research

This research is significant as it will have a great impact on household budgets at a time where spending is down to a bare minimum, due to the economic recession. Children's clothes are relatively expensive and parents have to return to the stores regularly to purchase more clothes, as the children out grow the clothes quickly.

This research will also have a great impact on consumption and waste management, as children will be able to wear specific items for much longer than previously. This will reduce the need to purchase items to replace still new garments, with less out grown clothes ending up in landfills.

7. Expected Outcomes, Results and Contributions of the Research.

The main objective of the research is to promote sustainability, through decreasing waste and excessive consumption. The adjustable children's clothes will provide a practical solution to the *problem of reducing waste and consumption*. The aim of the research is to design and produce a comprehensive clothes range for boys that can be adjusted and worn for a number of years, lengthening its lifespan.

This research could then aid other designers in the quest to find sustainable solutions to designing fashion.

8. Summary

This proposal is an attempt to find sustainable solutions to design problems. As a society we are consuming profuse amounts of resources in a bid to remain fashionable and keep up with ever growing trends, contributing to mass and overconsumption. We are doing this regardless of the negative impacts our actions have on the ecology, the environment and hence on society as a whole.

Incorporating the concept of sustainability into garments can be achieved through innovative design, such as *recycling, re –use and extending the lifespan of clothing*. And with this mindset we can slow the wheels of overconsumption and inevitably reduce the waste and pollution the by-products thereof, impose on our planet. My initiative of designing adjustable children's clothes giving the garments a longer lifespan and eliminating excessive waste and consumption, target these problems and provide but a mere solution to aid society in its endeavour to *become more sustainable*.

LIST OF REFERENCES

Chapman, J & Gant, N. 2007. *Designers, Visionaries + Other Stories*. London: Earthscan.

Fletcher, K. 2008. *Sustainable Fashion and Textiles: Design Journeys*. London: Earthscan.

Gauaghler, T. 2008. Growables Unique Children's clothes. *Growables*. [Online]. Available: <http://www.growables.com/unique-reversible-childrens-clothing.php> (February 2010).

Hart, L. 1997. *Beyond Greening: Strategies for a Sustainable World*. Harvard Business Review. January – February 1997.

Hethorn, J & Ulasewics, C. et al. 2008. *Sustainable Fashion: Why Now?* New York: Fairchild Books.

Strauss & Fuad Luke, A. 2008. *The Slow design Principles: A new interrogative and reflexive tool for design research and practice*. In: An International conference on the role and potential of design research in the transition towards sustainability, Torino, 10th -12th July 2008.



**Cape Peninsula
University of Technology**

**The Development and Construction of Sustainable Adjustable Clothing for Growing
Children.**

by

BE-ARTHA PETERSEN

Dissertation submitted in fulfilment of the requirements for the degree

Bachelors of Technology: Fashion Design

in the Faculty of Informatics and Design

at the Cape Peninsula University of Technology

Supervisor: Alletia Chistin and Avryl Dahl

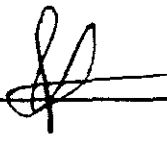
Co-supervisor: Maryna Bezuidenhout, Bryan Ramkilawan & Karen Suskin

Cape Town

25 October 2010

DECLARATION

I, Be-Artha Gaynor Petersen, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.



Signed

25 / 10 / 2010

Date

ABSTRACT

Children grow at fast rates. Due to this fact, parents constantly need to purchase new clothes as children out grow their clothes before it becomes fully worn. Parents spend thousands each year on children's clothing only to have them disposed of before it has reached its maximum wear ability.

The purpose of this research is to analyse children's growth patterns and investigate means of increasing the lifespan/ wear ability of children's clothing. The practise of increasing the lifespan/ wear ability of clothing lends itself to the Sustainable Design paradigm that encourages designers to create products (garments) with longer life-cycles and discourages waste at every stage of the products lifespan.

The process of "tossing out" clothes or not wearing it to its maximum utilization creates waste and fuels mass consumption. As a result masses of clothing end up in landfills and due to its mainly synthetic nature, it causes harm to the environment.

By incorporating innovative design and construction techniques I aim to explore methods of adjusting garments according to the growth experienced by children annually. This will allow children to wear the garments for a longer period eliminating the need for parents to purchase new clothing when the clothes no longer fit.

ACKNOWLEDGEMENTS

I wish to thank:

- The supervisors for their guidance in the research process and development of this dissertation
- I would like to show my gratitude to Maryna Bezuidenhout and Bryan Ramkilawan for their creative and technical input in the development and construction of the product range. They have made their support available in a number of ways.
- I wish to thank Gaironeesa Darries and Martha Nelson for their technical help and support throughout the years. Their expertise in the sewing room have helped me tremendously.
- I owe my deepest gratitude to my friends and peers who have been my encouragement and pillars of support through this enlightening experience. Thanking especially Lester Vermeulen, Puleng Khumalo and Nyra Negrao.
- This dissertation would not be possible without the love, confidence and faith of my family.

DEDICATION

For My nephews and nieces who inspire me with their growth.

TABLE OF CONTENTS

Declaration	ii
Abstract	iii
Acknowledgements	iv
Dedication	v
Glossary	viii

CHAPTER ONE:INTRODUCTION

1.1 The setting	1
1.2 Purpose statement	4
1.3 Sub- questions	4

CHAPTER TWO:CONCEPTUAL FRAMEWORK

2.1 Literature review	6
2.1.1 Over- consumption	6
2.1.2 Environmental impacts of over- consumption	7
2.1.3 Sustainability	9

CHAPTER THREE:CREATING AN EMPIRICAL SETTING

3.1 Reduce waste, contribute to sustainability	11
3.2 Modular or metamorphic clothing.....	14

CHAPTER FOUR:METHODOLOGY/ PRODUCTS

4.1 Methodology.....	15
4.1.1 Field approach and method of research	15
4.1.2 Information types / data gathering techniques:	16
4.1.3 Data analysis: findings	16

4.1.3.1 Sizing	17
4.1.3.2 Surveys and Informal Interviews	19
4.1.3.3 Empirical testing for the lengthening of garments	20
4.2 Products	22
4.2.1 Product type	22
4.2.2 Product description	23
Outfit 1	23
Outfit 2	24
Outfit 3	25
Outfit 4	25

CHAPTER FIVE: MARKET FEASIBILITY 27

5.1 Customers with need for product	27
5.2 Target market	27
5.3 Pester power	27
5.4 Competition	28
5.5 Competition strategy	28
5.6 Market- share goals	28

CHAPTER SIX: CONCLUSION 29

BIBLIOGRAPHY 30

APPENDIX 32

LIST OF FIGURES

Figure 1.1: Children's Growth Stages	2
Figure 2.1: Fast fashion, cheap fashion	7
Figure 3.2: Life Cycle Assessment of a T-Shirt	8
Figure 4.1: Armchairs from the Transformable Collection	12
Figure 3.2: Garment Extender	12
Figure 3.1: Patrick Cox 'Pieces' modular system of dressing.	14
Figure 4.1: Testing of Inverted Box Pleat Adjustment	20
Figure 4.2: Testing of Box Pleat Adjustment	20
Figure 4.3: Testing of Zip Adjustment	21
Figure 4.4: Jacket with Zip Adjustment	21
Figure 4.5: Extendable Cuff Adjustment	21
Figure 4.6: Design Board: Outfit 1	23
Figure 4.7: Inverted Box Pleat Adjustment	23
Figure 4.8: Design Board: Outfit 2	24
Figure 4.9: Box Pleat Adjustment	24
Figure 4.10: Design Board: Outfit 3	25
Figure 4.11: Zip Adjustment	25
Figure 4.12: Design Board: Outfit 4	25
Figure 4.13: Zip Adjustment	25

LIST OF TABLES

Table 4.1: Pattern Textbook Measurements	17
Table 4.2: Retail Store Measurements	18

Appendix: Survey on Children's clothing

GLOSSARY

Terms	Definition/Explanation
Adjustment	To change so as to match or fit; cause to correspond.
Mass production	The manufacture of goods in large quantities, often using standardized designs and assembly-line techniques.
Overconsumption	State or an instance of consuming/ utilizing too much food, drink, fuel, clothing, etc. Overconsumption is a result of mass production.
Sustainability	Using/ consuming only as much as what is necessary by placing as much resources back into the ecological system as one takes out.

(Farlex, 2010)

CHAPTER ONE

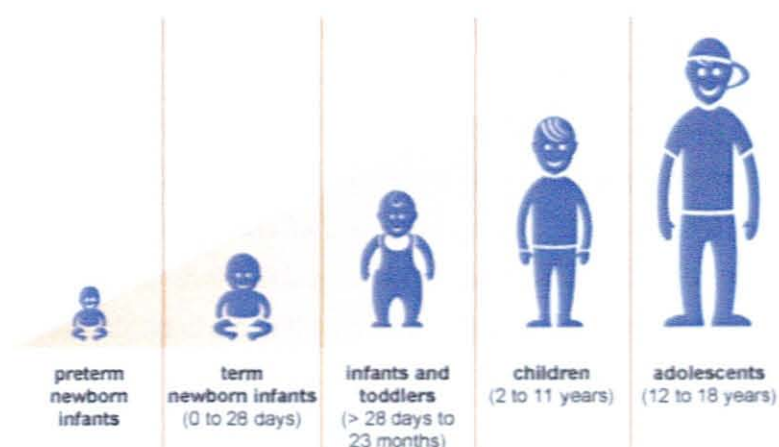
Introduction

The aim of this research is to explore methods of increasing the lifespan of children's clothing because children outgrow their clothes relatively quickly. With adequate research and experimentation, I aim to develop and construct a range of children's clothes that can be adjusted according to the natural growth of children. In doing so, I will rationalize the need to increase the lifespan of children's clothing by analyzing children's growth patterns and will explore sustainability practices which support the practice of extending the lifespan of garments.

1.1 The setting

It is clear that children grow relatively fast: according to children's size charts, commercial size ratings as well as published grading and pattern- making textbooks, children grow approximately 4 to 6 centimetres in height annually (see addendum A). The resultant effect of children growing at this rate is that they outgrow their garments within a matter of months, even though the garments are still in a wearable condition (Kaczynski, 2009).

This can be proven by the common fact that, traditionally, parents have handed down outgrown clothing items to younger children for generations. With this in mind would it not be fair to suggest that the clothes are in relatively good condition after the child has outgrown them? This proves that children outgrow their clothing well before it reaches its maximum wearing potential, as handed- down garments can be worn by yet another child for a long while thereafter. The process of handing down outgrown clothes is made possible because children's clothes are generally produced with strong, durable and good quality fabrics. Due to the nature of children, their garments are designed to withstand the wear and tear to which they constantly expose it (Aldrich, 1989:5). I therefore claim that when good quality materials and construction are used in the production of children's clothes, garments can withstand wear and tear and, with thoughtful design, can possibly surpass the usual time it takes for children to outgrow them.



**Figure 1.1 Children's growth stages,
(Children and Clinical Studies)**

The process of extending the lifespan of children's clothing should spare parents the expense of purchasing new garments once they no longer fit. Children's clothes are expensive, often costing as much as those of adults. The price of children's clothes in comparison to that of adults may seem unrealistic, but this is mainly due to the intricacy of the garments: the components are smaller and require longer handling times. With this in mind it would be safe to say that children's clothing is a considerable expense borne by many households, as parents have to purchase new garments frequently when the children outgrow them (Aldrich, 1989:5).

Another concern is the disposal of this clothing after it has been outgrown. Parents generally hand outgrown clothing down to younger children, either within or outside the immediate family. Alternatively it is handed down to domestic workers or donated to charity. The last resort is often to dispose of the clothing items via the dustbin. (Hethorn & Ulsewicz. 2008: xx)

The practice of designing garments for longer use, which is what I intend to achieve, lends itself to the Design for Sustainability movement. Janet Hethorn and Connie Ulsewicz claim that, "rethinking the process of garment creation, disposal or reuse with the focus on extending the lifespan of the garment, can be used to address the issue of sustainability" (Ulsewicz, C. 2008: xx). In the light of this quote, sustainability can be defined as the economical use of the resources available to us, which means using only as much of these resources as is necessary for survival, consuming on the basis of needs, not wants. These principles can be applied to clothing and many other consumables through innovative and thoughtful design. Consumption on this basis eradicates the accumulation of waste as whatever is needed is used to its full capacity and nothing is squandered (Welters, 2008:8).

The practice of replacing clothing items that have not reached their maximum period of wear ability, lends itself to the cycle of mass consumerism that is predominant within contemporary society. Mass production in a globalised economy ensures that society is constantly being bombarded with new, better products or fashions, through advertising, media features and the culture of celebrity. Society is consuming vast amounts of goods at an accelerated rate and is creating waste that is harmful to the environment. Waste is being accumulated at an alarming rate, so much so that society is starting to notice the harm it is causing, thus becoming more aware of the choices they make regarding the environment (Conca, Princen, Maniates. 2003:1)

In reaction to this awareness, conscientious consumers are seeking products that contribute to a more environmentally friendly society. The contemporary lifestyle trend of living sustainably is slowly but surely growing. The resultant effect: individuals, designers, industry leaders and brand makers are doing what they can to live more sustainable and environmentally friendly lifestyles. Sustainability involves the minimum use of natural resources, which include environmental, social and ecological resources. Various methods lend themselves to sustainability, such as recycling, reusing and reworking, thereby increasing the life cycle of resources already extracted from the earth.

Chapter two will provide a theoretical foundation for this research which is based on the theory of over-consumption; over-consumption being the practice of purchasing consumables that are not necessarily needed. This is directly linked to the wasteful practice of replacing garments that have not been used to their full potential. I will investigate what factors encourage over-consumption and the waste it generates along with its environmental implications. To support this I will define both 'Sustainability' and 'Slow Design'. These are the two theories that serve to reduce waste accumulation and the impact contemporary society has on the environment.

Chapter three will create an empirical setting for the products and link this to the theory. It will consider various methods of implementing the practices of sustainability and slow design in garments to extend the lifespan of such garments. I will also discuss modular and metamorphic clothing as a base for designing an adjustable range of clothing to increase the lifespan of garments.

Chapter four focuses on the development and construction of adjustable garments and is an extension of the theory discussed in chapter three. The aim of this practical component is to produce a range of children's clothing that is fully adjustable in order to accommodate the rapid growth of children and to extend the lifespan of their clothing. In this chapter I will

investigate children's sizes and their average growth per year to ascertain the necessary measurements to adjust the clothing. This chapter will analyze surveys conducted with parents to establish whether they experience rapid growth with their children and what happens to the clothes after their children have outgrown them. This survey will also give insight as to whether parents would consider the need for adjustable garments.

Chapter five analyses the market feasibility of the product. This includes the target market, the need for the product, the marketing and branding of the product as well as an analysis of the possible competition the range will face.

Chapter six concludes and gives a full summary of the research. This will include the findings, observations made and recommendations for future designers who wish to create garments for longer wear.

1.2 Purpose statement

The purpose of this research is to analyse children's growth patterns and explore methods of increasing the lifespan of garments to accommodate the rapid growth experienced by children.

1.3 Sub- questions

Sub- question 1:

Why is there a need to extend the lifespan of children's clothing?

In chapter 2 I will discuss the various reasons for the need to extend the lifespan of garments by investigating the adverse effects that over-consumption and waste have on the environment. I will also conduct an investigation of sustainability and slow design.

Sub- question 2:

What solutions are in place to increase the lifespan of clothing and reduce waste and over-consumption?

I will be looking at the various methods used by designers and other industry users to extend the lifespan of clothing that has already been produced, through recycling, reusing, restyling and extending the lifespan of these garments. This will include a definition of sustainability and the various ways of implementing sustainability in garment design, manufacture and the disposal of worn garments

Sub- question 3:

How can the lifespan of children's clothing be extended for longer wear?

Chapter three will focus on the methodology of the research and provide some insight to this sub- question. To accomplish this I will analyze children's size measurements to calculate the growth rate of children in order to estimate the average. I will also conduct pattern and construction experiments to test extension techniques required to extend the lifespan of children's wear garments.

CHAPTER TWO: Conceptual framework

2.1 Literature review

As discussed in chapter 1, children grow at a fast pace. Their growth rate per year varies from 8 centimetres at three years to 5 centimetres at ten years. Though this growth rate varies from child to child and age to age, children's clothing manufacturers have accepted the height interval of 6 centimetres per year for sizing purposes (Table 4.1 & 4.2). This then argues that children outgrow their clothes within a matter of months: the garment is bought at a particular length, the child grows about 6 centimetres over the next twelve months and the garment no longer fits. Parents are then faced with replacing an item of clothing that no longer fits but that they feel that is still in sufficiently good condition to be worn for several months longer. According to the concept of sustainability, the practice of discarding items before utilizing it to its full potential encourages waste accumulation and overconsumption.

In this chapter I will focus on overconsumption by consumers as a predominant trend within society today and how, by applying sustainability practices, we can overcome the negative effects this has on the planet. Why is the rate of consumption so high within contemporary society as compared to that of previous decades? How does over-consumption affect the environment? Theories and practices are in place to reduce the environmental, social and ecological damage caused by overconsumption: it is up to future designers to implement these theories in their products to create a cleaner and safer environment for the generations that follow ours.

2.1.1 Over- consumption

Fashion within contemporary society is fast moving. One day a trend is "in", the next it is "out" and consumers, designers and manufacturers are scrambling to keep up with the pace. In our globalised economy, it is possible for new fashions seen on the runways in Europe to reach consumers within days. And fashion trends are constantly changing. Therefore 'fast fashion' shoppers keep abreast of the latest trends which are accessible via digital television, the internet, magazines and social networks. They can purchase these new styles as soon as they are available in the stores. The media keeps society updated with changing trends, and the fashion designers, clothing manufacturers and retailers are all determined to meet the demand for new trends at cheap prices (Dickerson, 1999: 5).

The majority of clothing and textiles produced annually are manufactured in developing countries for very low prices, making these countries the cheapest places for production.

Globalization has allowed consumers, through cheap fabrics and low salaries, to afford ever-changing fashions as they hit the stores. Clothes are produced by the cheapest means possible in order for the retailers to receive a larger market share (Clark, 2008).



Figure 2.1 Fast fashion, Cheap Fashion
(Ethical Forum, 2010)

The cycle of mass production and consumption is driven by 'fast fashion', a term used to describe the pace of changing trends in today's society. 'Fast fashion' means that the latest trends become available as soon as they happen, and the desire for them is fuelled by the media, celebrities and the immediate awareness of these trends. Consumers are romanced into feeling that they 'must have' the latest trend. They purchase the garment and then quickly forget about it when the next fad hits the catwalk. Consumers over consume because they can: products are freely available and cheap, and purchasers usually experience a lack of understanding and appreciation for clothing because it is so readily available and disposable (Gill, 2008: 179).

2.1.2 Environmental impacts of over- consumption

As mass consumerism - especially in the fashion industry - is the over-consumption of products, what then happens to the by- products of all this production? Waste and toxins that accumulate in the manufacture, distribution and disposal of clothing and textiles are some of the largest producers of pollution on this planet (Gill, 2008).

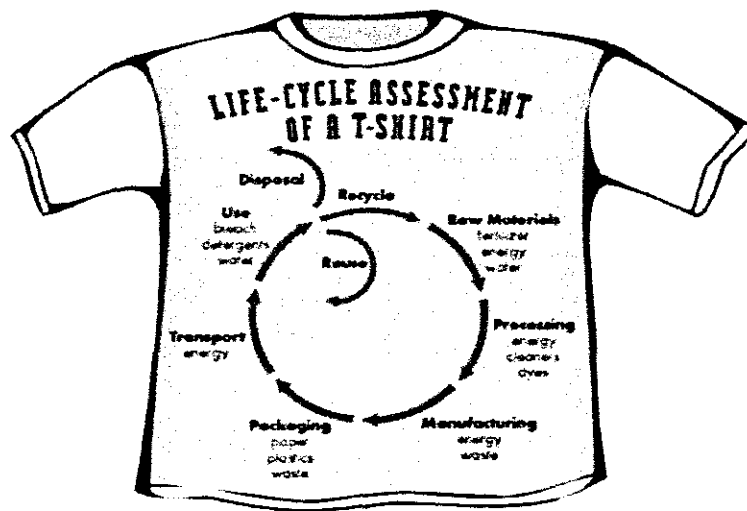


Figure 2.2 Life Cycle Assessment of a T-Shirt
(Worldwatch Institute, 2003)

The manufacture of textiles, natural or manmade, has drastic environmental implications. China for example, the frontrunner of textile and apparel manufacture is so badly polluted that workers in the factory environment are forced to wear masks to cover their faces. The pollution which is generated in producing the garments and textiles are chemicals, dyes and glues. These are extremely harmful to the environment and to the workers. These substances are literally making them sick (Gill, P. 2008: 180).

Products are shipped around the world and leave a large ecological footprint. The ecological footprint measures the environmental impact that this transportation has on the environment. Water and air pollution is caused at almost every stage, from manufacture to shipping and distribution and it is taking its toll on the environment (Gill, 2008: 179).

Post- consumer waste is another by- product of the fashion cycle, and is equally harmful to the environment. Large amounts of fabric waste end up in landfills and, according to the Environmental Protection Agency (EPA), an analysis conducted on the solid waste accumulated in the United States of America alone revealed an amount of 4 million tons per year. (Hawley, 2008: 211). Post- consumer waste is the used, outgrown, outdated, or damaged clothing that consumers no longer need. These items are usually disposed of either by giving them away to charity, friends and family, or by hosting a garage sale. But most of the fabrics end up in landfills. This is particularly harmful to the environment as the chemicals and toxins released from the decomposition and degradation of textile products seeps into the earth and causes immense damage (Gill, 2008: 179).

With the environment in mind, many initiatives have been put into place by individuals, as well as the major fashion companies, to reduce the waste caused by the over- consumption of fashion products. These initiatives include greener production practices, in which industry minimizes the use of toxic chemicals in fibre production and uses fibre sources that are easily renewable. Organic materials such as organic cotton, hemp, linen and ramie are being used instead of inorganic processed fibres that are grown and treated with toxic chemicals. With less toxic chemicals used in the production of these fibres, less harm is caused to the environment (Baugh, 2008:336).

2.1.3 Sustainability

Sustainability is the practice of the minimum use of natural resources which include environmental, social and ecological resources. The purpose is to reduce the environmental impact mass production and consumption has on this planet. Alastair Faud-Luke, an expert in the field of sustainability, claims that sustainability requires the adoption of a greener approach to design and manufacture through innovation and technology. He states that sustainability is "to take out the same amount of energy and resources that you put into a system, with no pollution or waste" (Faud Luke, 2007).

Products that are produced from good quality materials and high- value working ethics provoke an increased sense of awareness and appreciation in the consumer which encourages him or her to place more value on the product (Clark, 2008).

It is difficult to achieve full sustainability with fashion, as 'sustainable' means to slow down mass consumption, whereas 'fashion' means to change. According to Hazel Clark, Dean of the School of Art and Design History and Theory at the Parsons New School of Design, fashion by definition "... is concerned exclusively with the new and it relies totally on image and is seen as a choice rather than a mandate..." (Clark, 2008). This reinforces the argument that fashion is constantly changing and society as a whole is battling to keep up with these trends.

'Slow Fashion' is a concept that materialized as a reaction to the mass consumerism that predominates in contemporary society. It stems from the Slow Food movement which originated in Italy twenty years ago, and it provides a framework for more sustainable ways of approaching fashion. The slow design manifesto presented at the "Slow + Design" symposium which was hosted by Enzo Manzini, held in Milan in 2006, introduced some

methods and means to carry out design in a more sustainable way and thereby decrease the environmental, social and ecological harm caused by mass production. He claims that with slow design, garments need to be developed and produced with the garment's entire lifecycle in mind. This requires that garments should be produced with the intention of extended use, through the increase of the lifespan of that garment. To achieve this, products need to be produced with quality materials and have to be durable enough to withstand daily wear and tear. This process of extending the lifespan of garments is the theory I will implement in the development of my children's wear range to contribute to more sustainable design (Fletcher, 2008:190).

With all being said and done, the less we as a society consume, the more our resources will be spared: increasing sustainability by decreasing the amount of resources consumed and reducing the carbon footprint. Longer life products that are produced with good quality raw materials and high- value working ethics provoke an increased sense of awareness and appreciation and thus will encourage the consumer to place more value on the product (Clark, 2008).

CHAPTER THREE

Creating an empirical setting

To achieve sustainability we have to investigate methods of extending the lifespan of garments. This chapter will focus on how designers, major brand names and other industry users are using alternative means of implementing sustainability in their products through the increase of the product's life cycle. I will also test various methods of fabric and pattern manipulation to unearth the best possible techniques to use as a feature in designing adjustable clothes.

I aim to answer sub-question two, which is: what solutions are in place to reduce waste and over-consumption and how can these practices be implemented to produce a sustainable range of children's clothing?

3.1 Reduce waste, contribute to sustainability

The following section takes a look at the various sustainable solutions for over- consumption and waste, by not only increasing the lifespan and wear ability of clothing, but also by extending the lifecycle of garments - from fibre creation to decomposition. With the social implementation of these practices we can contribute to the creation of a more sustainable generation: namely, the practice in which the lifespan of clothes is increased through the handing down of clothing items from cradle to cradle. This design strategy is quite common amongst our society in general. Garments that are no longer needed by their owners are handed down, either for resale at second- hand stores or given away to charity or goodwill. These garments are given a second life and the action of someone purchasing a second- hand garment deviates from the purchase of mass- produced garments that are of the latest trend (Clark, 2008).

Another possibility of extending the lifespan of used clothing is by mending and reworking the garments to improve their fit, style and fashionableness. An example of such practices is that of one London- based organization, Junky Clothing. This organization deconstructs and then refurbishes previously worn clothing such as men's suits, shirts and jeans to give them a second life. This concept is developed to encourage slow design, which promotes longevity and diverts the users from conforming to fast fashion trends (Clark, 2008).

Designing garments for longer wear

Designers are incorporating permanence in their garments by designing for longevity. Suzan Loker, Professor of Fiber Science and Apparel Design at Cornell University, claims that in

order to reduce product and waste, we have to use garments for longer and purchase fewer of them. She says that in order to do this we have to design garments that have increased utility, such as transformable or adjustable clothing. These are garments that stratify multiple needs, as does Moreno Ferrari's 'Armchair' from his 'Transformable' range. The chair, as illustrated in Figure 3.1, has multiple uses: firstly it can be utilized as a raincoat and secondly it can be transformed into a couch.

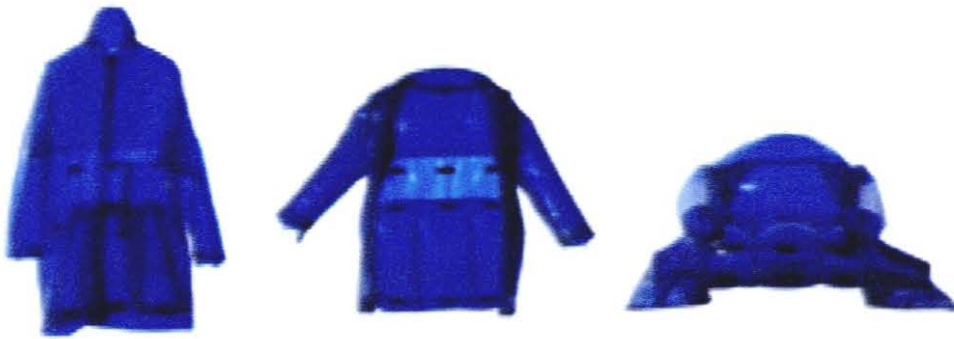


Figure 3.1 Armchairs from the 'Transformable' collection, 2001.
(Moreno Ferrari, 2001)

These designs broaden the use of products and are intended to be functional in more than one situation. By incorporating these qualities into their garments, designers are instilling more value into their products. By creating a more valuable product, consumers will use the products for a longer period (Loker, 2008:118). Adjusting or adapting clothing for longer use is yet another method of extending the lifespan of clothing. The "Garment Extender", made by One Step Ahead, is an extension piece that can be added to baby grows to allow for their longer use. This innovative design saves parents the trouble of purchasing new baby grows every couple of months.



Figure 3.2 Garment extender
(One Step Ahead, 2010)

The additional adjustment piece of the garment not only saves the parents money, it eliminates waste by not having to throw away items that are in good condition and can still be utilized (Loker, 2008:118).

In this way they design clothing that can be transformed and adapted according to style, silhouette and size. These clothing items can be worn in different ways to increase the consumer's wardrobe possibilities. Janet Hethorn, designer, writer and Professor at Delaware University, argues that the design of products that address consumer desires as well as integrating functional design practices, will lead to a satisfied customer who will keep the garments for longer. She claims that this already reduces the environmental impact that over-consumption has on the planet.

This information confirms that sustainability can be incorporated into clothing. Through the adjustment and adaptation of garments, clothing - especially children's clothing - can last longer, have increased wearing time and so reduce waste and consumption. I aim to use this theory as a backing for my research, to increase the lifespan of children's clothing through adjustment according to children's natural growth.

Recycling

Recycling of clothing and fibres is another solution to reducing waste sustainably. Recycling is the reuse of unwanted and discarded items, the means whereby a used item is given a renewed life cycle. Through recycling we are able to spare the amount of natural resources we take out of the earth. Recycling is simply the extension of a product's life cycle, utilizing it in every way possible before it diminishes. Similar too is the reuse of products as well as the longer use of products, extending the garment's lifespan (Clark, 2008). Polyester is one such fibre that can be reused. Polyester textiles are collected at various depots and then broken down into fibre form and reused. Companies such as the Patagonia and Teigin Group in Japan, have just such an initiative. The company recycles discarded polyester clothing and products, and returns it to its original virgin quality polyester state. This can then be spun and woven to make new textiles. This initiative is called a 'closed loop fibre to fibre' recycling system. It does not use any natural resources or produce excess pollution as in the production of virgin polyester, thus rendering recycling one of many sustainable solutions to waste (Loker, S. 2008: 123).

Similarly Martex Fibre Southern Corp, a US- based company that manufactures recycled industrial textile products, recycles cotton and cotton blends back to their fibrous state and produces various household and automobile products. These include mattress filler, under-carpet padding and sound insulation (Ulasewicz, C. 2007: 264).

With all these alternative methods of extending the lifecycle of garments, I claim that through research and experimentation I will be able to increase the lifespan of children's clothing through the adjustment and adaptation of garments. The process of doing so will be explained in the next section.

3.2 Modular or metamorphic clothing

Modular clothing is a system of dressing that applies the principles of separates and layering. This system is implemented for the adaptability and versatility of garments in a modern environment, where contemporary, urban society requires individuals to change several times a day according to their busy lifestyles. Modular clothing allows the wearer to mix and match clothing or clothing components to their liking in order to expand their wardrobe options (Bolton, 2002: 28).

Patrick Cox, a London shoe designer, took the modular clothing concept a bit further by creating metamorphic garments to increase the adaptability and versatility of garments. Metamorphic garments embody the concept of creating garments in which the components are completely interchangeable, allowing the user to transform the garment to their liking. Trousers are converted into shorts and jackets into vests by simply unzipping or unclipping a panel. These pieces are not only removable; they are also interchangeable, allowing for greater flexibility and use (Bolton, 2002:29).

The concept of modular and metamorphic clothing provides a model for the conceptualization and construction of the adjustable garments that I intend to produce to increase the lifespan of children's clothing. I will employ and develop the concept of unzipping and unclipping panels to elongate or lengthen particular areas of the garment.

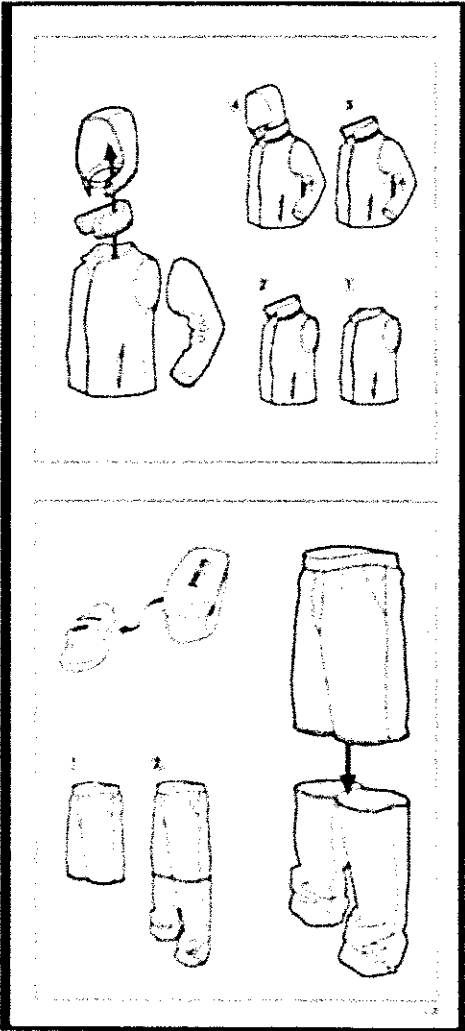


Figure 3.1: Patrick Cox 'Pieces' modular system of dressing. (Bolton, 2002)

CHAPTER FOUR

Methodology/ Products

4.1 Methodology

Sub- question 3: How can the lifespan of children's clothing are extended for longer wear?

The purpose of this chapter is to apply the knowledge gained from the previous chapters and use this information to formulate an answer to sub- question 3, which aims to solve the problem of how to create a range of garments that is able to surpass the "normal" lifespan of children's clothing. To answer this I will have to take into consideration the variables that are integral to increasing the lifespan of garments. The variables include:

- Materials
- Quality
- Pattern
- Sewing quality

4.1.1 Field approach and method of research

Field: Sustainable Fashion

Sustainable fashion is a means of creating garments sustainably. This includes producing garments from recycled materials, re-using clothing through the wearing of second- hand clothing and designing for longer wear. The essence of sustainable fashion is to create fashion with those materials that already exist, not to take any natural resources from the earth and cause no pollution. Designing for longer wear falls into this paradigm in which wearing a garment for an extended period of time deters the customer from purchasing a new garment, which has been produced from scratch, to replace it.

Approach: Qualitative Approach

- Empirical testing, using pattern and fabric manipulation with the use of trims to formulate means of adjusting garments.
- Tests are done on fabrics to test the quality and longevity of the fabrics used.
- Trend research – How to produce garments that are sufficiently trendy in order for the customer to react positively and buy the product.

Quantitative approach: Surveys

Is there a need for adjustable clothing? Do parents feel that their children outgrow their clothes before these clothes become outworn or obsolete? Will parents buy into the idea of longer- lasting clothing?

Method: Action research

The problem is addressed through the empirical testing of pattern, fabric durability and quality. This testing will be done by me (pattern manipulation) and the technology station (quality)

4.1.2 Information types / data gathering techniques:

The information to test the hypothesis which is that sustainability can be integrated in garments through the adjustment of children's clothing was collected primarily by me. This information was collected from various sources such as the internet, data bases, in-store visits and empirical testing.

The data collected is as follows:

- **Internet** – I mainly used the internet for trend research. The site visited for this was WGSN, which is a trend- forecasting site and includes key shapes, colours, styles and silhouettes for upcoming seasons.
- **Books** - I consulted a number of patternmaking books for guidance with regards to sizing, grading and pattern manipulation for the adjustment panels used in the making of the product.
- **Empirical testing** – Tests were conducted to generate means of adjusting the lengths of sleeves and trousers. Tests were also conducted at the Cape Peninsula University Technology Station to test the quality, longevity and durability of the fabrics used in the production of the garments. This testing is crucial to the research as the garments are created specifically for longer wear.
- **Surveys** – A survey was sent out via email to a group of mothers with children between the ages of 4 to 13 years, to find out whether they experience rapid growth with their children and if this calls for the need for adjustable clothing.

4.1.3 Data analysis: findings

The purpose of this research is to create a sustainable range of children's clothing for longer wear and extended use. In order to create a sustainable range of children's clothes I investigated what sustainable methods can be utilized to extend the lifespan of the garments. I found that, through the adjustment of children's clothing to lengthen the garments, I am able to extend the length of time children are able to wear a garment (Loker, 2008:118). To achieve this I needed to research children's growth patterns, how long they generally wear

the clothes before outgrowing them and if the clothes are still in good condition once they have outgrown them. The following sections address this process and document my findings.

4.1.3.1 Sizing

Firstly I had to ascertain how fast and by how many centimetres the average child grows. In order to get this information I had to consult with various pattern -making and grading books, such as Alice Defty's "Creating Patterns" and Winfred Aldrich's "Metric Pattern Cutting for Children's Wear"

Winfred Aldrich, author of "Metric Pattern Cutting for Children's Wear" (2009), claims that children's growth rate ranges from 8 centimetres at three years to 5 centimetres at ten years, in height per year. A comparison between the two pattern- making text books reveals that children between the ages of five and eight years grow an average of 6 centimetres in height per year.

Table 4.1: Pattern textbook measurements

Source		5 yrs	6 yrs	7 yrs	8 yrs
Alyce Defty	Height	109 cm	116cm	122cm	127cm
	Chest	58.5 cm	61cm	63.5cm	66cm
	Waist	61.5cm	64cm	66.5cm	69cm
Metric Pattern Cutting	Height	110cm	116cm	122cm	128cm
	Chest	59cm	61cm	63cm	66cm
	Waist	56cm	58cm	59cm	60cm

She finds that this growth rate occurs more in the child's limbs as they grow taller in stature, i.e. their legs and arms grow faster than the rest of their bodies. This strongly suggests that children's arms and legs can grow up to 4 centimetres per year.

Another observation is the difference between the rates of height to waist and chest growth rates. Children's chest and waist measurements change by a mere 2 centimetres per year, on average, in comparison to the greater increase in height and limb length. Aldrich explains this as the 'slimming down' process, where children between the ages of two and eight

years, grow faster in length than in girth, can maintain more or less the same waist measurement and still experience an increase in length.

They go on to explain that although in-depth research has been done on children's measurements and sizes, it is only a crude estimate as: "differing height and width dimensions are found in all age groups, so no basic average rules can apply to the age factor" (Defty, 2007: 470).

With this in mind, I examined industry sizes which I obtained from retail stores located in the Cape Town CBD. The stores visited were popular children's clothing outlets: Woolworths and Ackerman's. The table of industry sizes (Table 4.2) reveals a 6 centimetre height interval and an average of a 2 centimetre chest interval in each size.

Table 4.2: Retail Store Sizes

Source	M	4- 5 yrs	5- 6 yrs	6- 7 yrs
Ackerman's	Height	108- 114 cm	119 cm	120- 125 cm
	Chest	58 cm	61 cm	63 cm
	Waist	61 cm	63 cm	65 cm
Woolworths	Height	108- 114 cm	119 cm	120- 125 cm
	Chest	58 cm	61 cm	63 cm
	Waist	61 cm	63 cm	65 cm

These size differences have great implications for garments as the arm and leg length is crucial for the correct fit.

Implications for product

With this information I am able to confirm that children grow by an average of 4 to 6 centimetres in height per year, and up to 3 centimetres across the waist and chest. With these figures I am able to establish the amount needed to adjust the length and width of the garments in order to extend the wearing period of a garment beyond the usual time that the garments are worn. As the waist and chest measurement increase is small, the major adjustments will focus on lengthening the arms and legs of the garments, as this is where growth occurs more drastically.

4.1.3.2 Surveys and Informal Interviews

A survey was conducted with a group of 100 mothers who have young children between the ages of 4 and 13 years. The survey was constructed to:

- Find out how long children wear their clothing before it becomes outgrown.
- Discover what happens to the clothing after it has become outgrown.
- Find out what condition the clothes are in after the children have outgrown it.

(See Addendum A)

This is vital information because it gives insight into whether the development of adjustable garments is feasible and whether parents will buy into the product.

With the information gathered from the survey I found that:

- Children generally wear trousers and jackets for 12 months before the leg and arm length becomes too short.
- Though the length is too short the waist generally still fits.
- Parents find that though the clothes are outgrown the condition of the clothes is still good.
- As the condition of the clothes is still good, parents opt for handing it down to younger children either within or outside the immediate family.

In informal interviews held with parents of multiple children I was able to find that after the garment is handed down, the second child can wear the garment for a full cycle before the garment becomes worn and dated.

Implications for product

The survey and the interviews give insight as to whether the parents experience children outgrowing their clothing and if it poses any problems - both financially and economically. This information is vital as it gives me an indication as to how long the clothing is worn before it becomes outgrown and what kind of condition the clothing is in once it has become outgrown.

I aim to extend the wear ability of the garment from the usual 12 months up to 18- 24 months by making the clothes adjustable. This should be possible as parents explained that the clothes are still in good condition and can be worn for a full cycle by a second child.

4.1.3.3 Empirical testing for the lengthening of garments

Through the construction and manipulation of working patterns I have been able to extend the garments by 4 to 6 centimetres in length. Firstly I had to find the least expensive means of doing so, without compromising the style, quality and comfort of the garments. I observed that additional seams placed in garments increases the price of the garments so I had to experiment with using the least expensive alternatives. With this in mind I have incorporated horizontal pleats into the design of the garments.



Figure 4.1: Testing of Inverted Box Pleat Adjustment
(Be-Artha Petersen, 2010)

Through experimentation with pattern and fabric prototypes, I found that by using box pleats, inverted box pleats, knife pleats and zippers, that this is indeed possible. Folding the fabric or pattern in specific places gives the fabric an addition that can be extended or constricted according to the required length. Following this, I placed the pleats horizontally, allowing for the extension of the garment without unnecessary seams that add bulk to the garment.

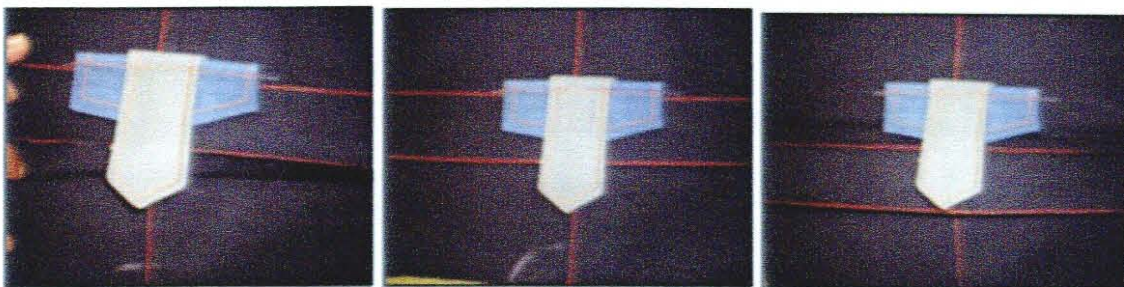


Figure 4.2 Testing of Box Pleat Adjustment
(Be-Artha Petersen, 2010)

The next step was to explore methods of making the adjustments permanent so as to secure the pleats before and after the adjustment is done. This will ensure that the garments have permanence and durability. I found that top-stitching the pleats on the fold lines secures the pleats before the garment has been adjusted and adds a good aesthetic appearance to the garments after it has been adjusted. With the pleats I incorporated the use of snaps, buttons and zippers to secure the garment before it is adjusted.

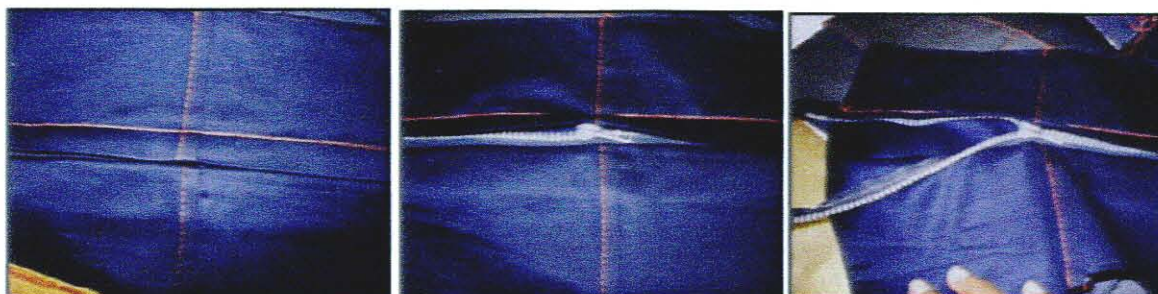


Figure 4.3 Testing of Zip Adjustment
(Be-Artha Petersen)

Zips are placed at the shoulder and armhole that unzips to reveal an extra length of fabric, to allow for extra space for movement of the arms and lengthens the across back measurement.



Figure 4.4: Jacket with Zip Adjustment
(Be-Artha Petersen)

The fabrication of the extra insert at the shoulder is stretch ribbing and is in contrasting fabric. This is to improve comfort ability and create less bulk under the arm pits.

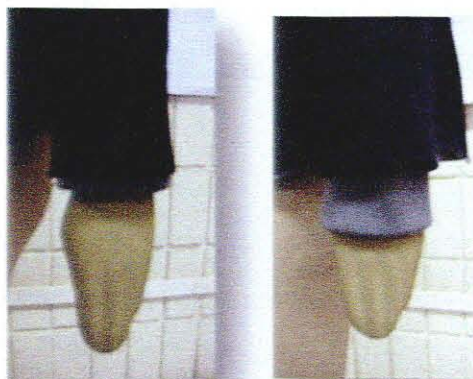


Figure 4.5: Extendable Cuff Adjustment
(Be-Artha Petersen)

Figure 4.5 depicts the cuff lengthening adjustment. For the smaller size the cuff is mainly inside the sleeve and is secured using a button, also located inside the sleeve. After the child grows, the cuff can be extended by unbuttoning the button that secures it. This extends the arm length by 2- 4 centimetres and adds a pleasant design detail to the garment.

The adjustment sections are not only functional but act as design details as well. They give the garment an aesthetic appeal and add a constructed element to the clothes, rendering the garments multi-functional. These adjustments will be included in the design and construction of all the outerwear garments, the reason being: outerwear garments are harder wearing and more durable.

4.2 Products

4.2.1 Product type

Boi Clothing designs and produces mainly outerwear that is hard- wearing and is priced at a higher price point, such as jackets, jeans and over- garments. We also design and supply basic t-shirts and tops, such as hoodies. The outerwear and higher priced items such as the anoraks, denims, etc, are produced from high-tech fabrics and come with an adjustment feature built into each garment to extend longevity and reduce waste.

Our basics, which include t-shirts, spencers and long- sleeved tops, are made from quality cotton blends, such as 98% cotton with 2% Lycra or Elastine to ensure that the garment maintains its structure and allows for longer wear. The *Boi* logo is printed, embroidered and appliquéd on to the t-shirts along with graphics. This gives the product an exciting edge and caters for the branding of the product.

Over- garments

Our over- garments consist of anoraks, parkas, denim jackets, windbreakers and puffa jackets. These garments are produced from high quality fabrics:

- Cotton Twill- Anoraks
- Quantec - Parkas
- Ripstop- Wind breakers
- Denim 100% Cotton – Denim jackets

These items all include adjustment layers that can be expanded to allow for the lengthening of garments. These garments are double- stitched and lined to provide for great comfort and durability. Problem areas such as elbows are reinforced with contrasting fabric so that when the garment is under stress and becomes worn out through negligence; the contrast will show through, creating a feature.

Jeans

Our jeans are made with the highest quality 100% cotton. We supply a variety of cuts for the winter season. Such as:

- Carrot Leg
- Straight leg
- Baggy
- Skinny leg

Our denim jeans come with knee and ankle adjustment methods. The garment is fully adjustable: the jeans can be lengthened and the waist band can be extended allowing for the jeans to be worn over two years. As with the jackets, the jeans stress areas are also reinforced with extra contrasting fabric to ensure that the product is still wearable if the knees are ripped. This will then double up as a design detail.

4.2.2 Product description

This section lists each outfit along with the adjustment panels for both the jackets and trousers.

Outfit 1



Figure 4.6: Design Board: Outfit 1

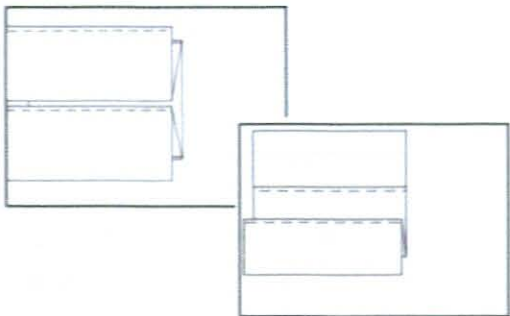


Figure 4.7: Inverted Box Pleat Adjustment

Cargo Pants

Fabric: Heavyweight cotton blend twill. The cotton is blended with polyester, making it strong and durable and able to handle a fair amount of stress. The twill is colour-fast and therefore allows for good wash ability, ensuring that the garment does not fade with time.

Figure 4.6: Design Board: Outfit 1

Adjustment: the pants have knee adjustment panels and are secured with top stitching and snaps placed on the inside and outside leg. The inside panel of the box pleat is 6 cm in length and, once folded out, allows for the pants to be lengthened by that same amount. The adjustment is masked with a pocket to add a finishing detail. The waistband is fully adjustable and can expand to 4 cm of extra length.

Puffa Jacket

The jacket is made with cotton blend quilting and has no adjustment detail. The jacket is, however, longer length with extra wide armholes that allow for movement and growth.

Outfit 2



Figure 4.8: Design Board: Outfit 2

Cargo Pants

Fabric: Heavyweight cotton blends twill. The cotton is blended with polyester making it strong and durable and is able to handle a fair amount of stress. The twill is colour-fast and therefore allows for good wash ability ensuring that the garment does not fade with time.

Adjustment: Snap adjustment

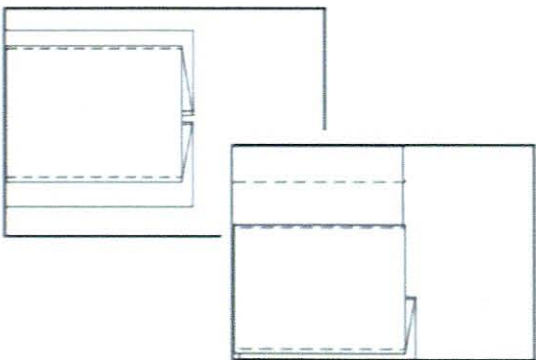


Figure 4.9: Inverted Box Pleat Adjustment

Snaps are placed on either side of the leg, each bearing 6cm of extra fabric. When done up (smaller size) the snaps form a box pleat and when undone the snaps act as a design detail.

Anorak

Adjustment: Elbow and Shoulder zip adjustment: Zips bearing an extra 6cm of fabric are placed just below the elbow and, when unzipped, lengthen the sleeve by 6cm.

Outfit 3



Figure 4.10: Design Board: Outfit 3

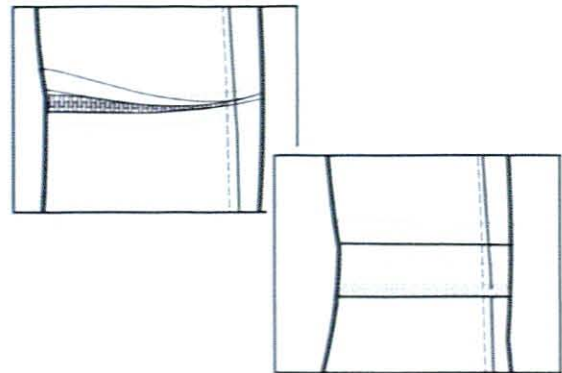


Figure 4.11: Zip Adjustment

Denim jeans

Fabric: Jeans are made from 100% cotton denim which is durable and colour- fast.

Adjustment: Zip adjustment

The pants adjustment is located just below the knee and can be both lengthened and converted to shorts.

Outfit 4



Figure 4.12: Design Board: Outfit 4

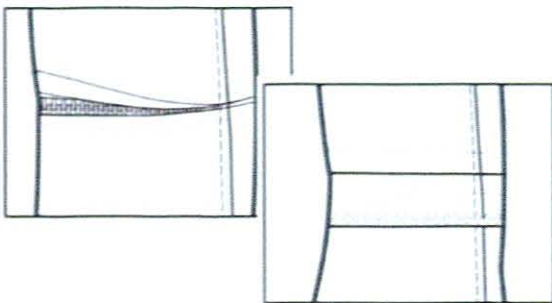


Figure 4.13: Zip Adjustment

Denim pants/ Shorts and Jacket

Fabric: Denims are made from 100% cotton durable and colour- fast denim.

Adjustment: Zip adjustment

The pants adjustment is located just below the knee and can be both lengthened and converted to shorts.

The jacket adjustment is located at the armhole. The sleeve head contains an extra piece of fabric that is 6cm long and which can be unzipped to reveal the extra length.

Sourcing

Boi Clothing sources all of its raw material from several local agents situated in the greater Cape Town area. The agents supply fabrics and trims that are both imported and local.

Through good contacts Boi Clothing has found excellent sources of specialized fabrics such as water- resistant Quantec and Ripstop which is used in the production of its jackets. Top of the range YKK zips are used in all the garments and only top quality denim and cotton jersey are used in the production of our basic range.

CHAPTER FIVE

Market feasibility

Boi clothes intend to target children, both boys and girls, in the Western Cape area who require competitively priced, branded clothing. Within all groups, there are no colour barriers and customers have diverse backgrounds. These consumers range between three months to fifteen years.

5.1 Customers with need for product

Mothers control 93% of what is spent on children's wear. As well as wanting them to have the best and latest look, the quality of children's clothes is important to a mother or guardian because this makes it last longer and therefore decreases the need to replace the clothes.

5.2 Target market

Children and teenagers represent an important demographic to marketers because they have their own purchasing power and influence their parents' buying decisions. They are the adult consumers of the future and therefore the availability and choice of sustainable clothing helps to condition them into becoming selective when they themselves reach the years of parenthood.

Parents today are willing to buy more for their children because trends such as smaller family size, dual incomes and the postponement of having children until later in life, mean that families have more disposable income. Guilt, as well, can play a role in spending decisions! Time-stressed parents may often substitute material goods for time spent with their children. These are some examples of marketing strategies used for our target market.

5.3 Pester power

Children today have more autonomy and decision-making power within the family than in previous generations, so it follows that they can be vocal about what they want their parents to buy. "Pester power" refers to children's ability to nag their parents into purchasing items they may not otherwise buy. Marketing to children is all about creating pester power, because advertisers know what a powerful force it can be.

There are two categories of pester power:

Persistence – a plea that is repeated by the child over and over again until the parent gives in and purchases the product.

Importance – parents desire to provide the best for their child and to be seen to do so.

5.4 Competition

Strengths – Our strength is our unique design that eliminates the constant purchasing of children's clothes by allowing the parent to adjust the clothes they have already acquired from our store.

Weakness – Using fabric that is more expensive to ensure that our clothes last for up to four years, in perfect condition; the intricate engineering that goes into the design of the adjustable clothes puts us at a disadvantage because of the extra costs incurred to make the clothes

5.5 Competition strategy

Boi Clothing will have some intense competition from some of the other leading children's stores. At Boi Clothing we are hoping that our unique idea of using environmentally friendly clothing in an age where consumers are more aware of what consumerism and waste do to our planet, will make the consumer more likely to want to spend their money at our store, thus feeling that they are doing their part to conserve our earth.

Our other positive feature is that of making adjustable clothing: this gives the garments a longer life span. Children grow faster than adults and as a result their clothes need replacement quickly. Usually this causes parents to opt for the cheaper brands of clothes and therefore contributes to waste - the parent having to purchase more clothes after a shorter period of time. Our expandable clothes allow the parent to make adjustments and the quality of fabric is more durable and longer lasting.

5.6 Market- share goals

The children's wear industry has grown considerably in recent years, but still remains a small market segment and so it can be a difficult one for small manufacturers to enter. Since children's wear trends increasingly reflect those of adult apparel, children's clothes must not only please children, but also be very similar to current trends in the adult market. This calls for steady monitoring of the market and good flexibility and quick adaptation on the part of the manufacturer. Major firms that market adult collections at the same time as children's copies have a head start in this regard.

CHAPTER 6

CONCLUSION

This research is an attempt to find sustainable solutions to designing problems. As a society we are consuming far too many resources in a bid to remain fashionable and keep up with ever- growing trends. We are doing this regardless of the negative impact our actions have on the ecology, the environment and society as a whole.

As future designers it is our responsibility to take action and design for a better tomorrow, by implementing sustainability and by using fewer natural resources, through creativity and innovation. Design initiatives should be carried out with the least impact on nature possible, considering not only the production of such goods but the life cycle, end- use and disposal of the products.

My initiative in designing adjustable children's clothing, thus giving the garments a longer lifespan and eliminating excessive waste and consumption, targets these very problems and provides but one solution to aid society in its endeavour to become more sustainable.

BIBLIOGRAPHY

Baugh, G. 2008. Fibres: Clean and Green Fibre Options. In: *Sustainable Fashion: Why Now?* Edited by: J. Hethorn & C. Ulasewicz. New York: Fairchild Books: 326- 357.

(Bolton, 2002:29).

(Dickerson, 1999: 5).

(Fletcher, 2008:190).

(Welters, 2008:8).

Chapman, J & Gant, N. 2007. *Designers, Visionaries + Other Stories*. London: Earthscan.

Clark, H. 2008. Slow + Fashion – An Oxymoron or a Promise. *Fashion Theory*, 427(20): 12.4, December 2008.

Conca, K. et al. Confronting Consumption. *Massachusetts Institute of Technology*, 1(3): 1-10. August 2001.

Defty, A. 2004. *The Fascinating Art of Creating Patterns*. South Africa: Durban Institute of Technology.

Ethical Forum. 2010. *Fast fashion, Cheap Fashion*. [Online].

Available: http://www.ethicalfashionforum.com/assets-uploaded/images/fast_fashionS.jpg. [20 July 2010]

Farlex. 2010. The free online dictionary. [Online]. Available: <http://www.thefreedictionary.com> [10 October 2010]

Fletcher, K. 2008. *Sustainable Fashion and Textiles: Design Journeys*. London: Earthscan.

Gysin, K. 2003. Moreno Ferrari for CP Company, "Armchair from the Transformable Collection. [Online]. Available:

http://www.dutchdesignevents.com/images/strangelyfamiliar/ferrari_armchair_lg.jpg&imgrefurl=http://www.dutchdesignevents.com/strangelyfamiliar.html&usg=__hbHzGj-NieQfvNCL3Uizl0uefss=&h=346&w=800&sz=102&hl=en&start=5&zoom=1&um=1&itbs=1&tbnid=k8-PmRIW3mDaYM:&tbnh=62&tbnw=143&prev=/images%3Fq%3Dtransformables%26um%3D1%26hl%3Den%26tbs%3Disch:1

Hart, L. 1997. *Beyond Greening: Strategies for a Sustainable World*. Harvard Business Review. January – February 1997.

Hethorn, J. 2008. Consideration of Consumer Desire. In: *Sustainable Fashion: Why Now?* Edited by: J. Hethorn & C. Ulasewicz. New York: Fairchild Books. 53- 76.

Kuczynski, A. 2009. The Best Dressed List. *New York Times Magazine*, 11/08/2009:32, November 2009.

Lewis, VD. 2008. Developing Strategies for a Typology of Sustainable Fashion Design. The Fashion of Sustainability. In: *Sustainable Fashion: Why Now?* Edited by: J. Hethorn & C. Ulasewicz. New York: Fairchild Books. 233- 261.

Loker, S. 2008. A Technology- Enabled Sustainable Fashion System: Fashion's Future. In: Sustainable Fashion: Why Now? Edited by: J. Hethorn & C. Ulasewicz. New York: Fairchild Books.

Reay, D. 2009. Inconspicuous Consumption. *New Scientist*, 204(2376): 43-47, November 28.

Strauss & Fuad Luke, A. 2008. *The Slow design Principles: A new interrogative and reflexive tool for design research and practice*. In: An International conference on the role and potential of design research in the transition towards sustainability, Torino, 10th -12th July 2008.

The Fashion of Sustainability. In: Sustainable Fashion: Why Now? Edited by: J. Hethorn & C. Ulasewicz. New York: Fairchild Books.

Ulasewicz, C. 2008. Fashion, Social Marketing, and the Eco- Savvy Shopper. In: Sustainable Fashion: Why Now? Edited by: J. Hethorn & C. Ulasewicz. New York: Fairchild Books. 30-51.

Welters, L. 2008. The Fashion of Sustainability. In: Sustainable Fashion: Why Now? Edited by: J. Hethorn & C. Ulasewicz. New York: Fairchild Books. 7- 29.

Children and Clinical Studies. 2010. Children's Growth Stages. [Online]. Available: <http://www.nhlbi.nih.gov/childrenandclinicalstudies/whydo.php&usq=kWQK0nInff4rhpGmVgxMLBRzHew=&h=273&w=480&sz=21&hl=en&start=1&zoom=1&um=1&itbs=1&tbnid=z4D1YVvBDH9sXM:&tbnh=73&tbnw=129&prev=/images%3Fq%3Dchildren%2Bgrowth%2Bstage%26um%3D1%26hl%3Den%26tbs%3Disch:1>

Worldwatch Institute, 2003. *Worldwatch Paper 166: Purchasing Power: Harnessing Institutional Procurement for People and the Planet*. [Online]. Available: <http://reviewsofaswisslondoner.blogspot.com/&usq=ax1nzKyHd4Kmpevuyo61NOZWSw=&h=450&w=600&sz=46&hl=en&start=5&zoom=1&um=1&itbs=1&tbnid=usYuir4zX1I0JM:&tbnh=101&tbnw=135&prev=/images%3Fq%3Doverconsumption%2Bfashion%26um%3D1%26hl%3Den%26tbs%3Disch:1> [20 July 2010]

APPENDIX

Children's Clothing Survey

I am currently studying Fashion Design at CPUT; I am in my fourth year and doing my thesis on children's clothing. To aid me in my studies I need to find out a few details from parents regarding children's clothing. It would be greatly appreciated if you could answer these simple questions and mail them back to me as your input will be appreciated.

Thank you

Please mark answers with colour below.

1. How many children do you have?

1-2	2-3	3-4	More
-----	-----	-----	------

2. What age/s?

0-3	3-5	5-8	8-13
-----	-----	-----	------

3. Where do you purchase your child's clothes?

Ackerman's/ Mr. Price	Edgars/	PEP
Kids Boutiques (e.g. Naartjie, Phoebe &	Woolworths	

4. What price range? (Denims, cargo's, jackets, etc.)

R80-	R100- R150	R150- R200	R200- R350
------	------------	------------	------------

5. What are important factors when purchasing children's clothing?

Quality	Style	Durabilit	Price	Brands
---------	-------	-----------	-------	--------

6. How long does your child wear his/her pants for before they outgrow it?

6- 8 Months	8- 12 Months	12- 18 Months
-------------	--------------	---------------

7. How long does your child wear his/her jacket for before they outgrow it?

6- 8 Months	8- 12 Months	12- 18 Months
-------------	--------------	---------------

8. Are the clothes still in a good condition after they outgrow it?

YES	NO
-----	----

9. What happens to the clothes after the child has out grown it?

Hand down to younger	Charity	Recycle	Throw
----------------------	---------	---------	-------

10. If there was a way to lengthen children's clothing according to their growth would you be interested in it?

YES	NO
-----	----

Thank you; your answers will be put to good use.