The role of parental self-efficacy, parental feeding practices and home food environment in influencing preschool aged children's diet.

Student: Sarah Duncan BPsych (Hons)

The University of Newcastle

Thesis submitted for: Professional Doctorate in Clinical and Health Psychology

December 2011

Supervisor: Associate Professor Jenny Bowman

University of Newcastle

Supervisor: Dr Luke Wolfenden

University of Newcastle

Supervisor: Dr Leah Brennan

Monash University Centre for Obesity Research and Education

### Statement of Originality and Declarations

This dissertation contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my dissertation, when deposited in the University Library\*\*, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

#### Acknowledgements

In many ways this thesis has been a long time in coming. There have been many people along the way that have contributed, even if just by offering me words of encouragement and empathy. And of course there has been the significant and hugely appreciated contribution of each of my research supervisors in offering not only encouragement, but wisdom, practical advice and feedback. To Associate Profession Jenny Bowman, thank you for your constancy in being there, the balance you provide in perspectives, your sympathy, understanding and enthusiasm. To Dr Luke Wolfenden, thank you for your willingness to take me on board as a student and for your flexibility and generosity with your time and my section of this project. To Dr Leah Brennan, your keen expertise and exceptional feedback have been essential in making this thesis work for which I am truly grateful. And also my thanks to the rest of the research team for your time and patience with me throughout this process.

To my family and friends, who for a long time heard very little else except my stresses, worries, mumbles about timeframes and workload issues relating to this thesis. Your loving support and absolute confidence in me carried me through. My parents specifically, Sue, Greg, Barb and Robbie have been amazing throughout this whole process. To my best friend Julie, who has accepted my social absence on many occasions and to Flora for her support and care throughout (we made it<sup>©</sup>). And to my fiancé Graham: for nagging me when I needed it and not nagging me when I needed it. For being accepting of the impact my post-graduate study has had on *our* lives and cheering me up with hugs, love and one polar bear cub. I love you all so much.

Last, but not least, I'd also like to acknowledge my fellow students. From the girls who I started this long journey with back in 2006, Jane, Danielle, Lyndell and Denise, to those who I met along the way including Paula, Rickie-leigh, Rebecca and Kath from the clinic and on the work circuit Sarah C, Kimberley and Michelle. To all the commiserations, advice, catch ups and general support that I found essential to continuing on and completing this colossal goal of post-graduate study,

Thank you,

Sarah L. Duncan.

Statemen	t of Originality and Declarations	ii.
Acknowle	edgements	iii.
List of Ta	ables	.viii.
List of Fig	gures	X.
Abstract .		xi.
Introducti	ion	1.
1. D	iet and Health	1.
1.	1. The impact of fruit and vegetable consumption on health	2.
1.	2. The impact of diets high in fat, sugar and salt on health	4.
1.	3. The impact of full fat dairy intakes on health	8.
2. Tł	he Development of Dietary Patterns and Eating Behaviours: the	
ir	mportance of intervention in childhood.	9.
2.	1. Parental influences on the development of dietary patterns: targeting	
	parents as a mechanism for improving child diet.	11.
2.	2. The impact of home food environment on the development of	
	dietary patterns in children.	13.
2.	3. The impact of parental feeding practices on the development	
	of dietary patterns in children.	15.
3. M	lodifiable intervention targets for parental influences on child diet: a	
re	ole for parental self-efficacy?	21.
4. A	bigger picture model: linking multiple aspects of parental influence	
0	on child dietary outcomes.	31.
5. Tł	he Present Study: Aims and Hypotheses	37.
Method		40.
6. D	esign and Setting	40.
7. Pa	articipants	40.
8. Pr	rocedures	41.
8.	1. Recruitment.	42.
8.	2. Conduct of baseline interviews/data collection	43.
9. M	leasures/Materials	43.

## Table of Contents

9.1. Demographic questions	43.
9.2. Children's Dietary Questionnaire (CDQ; Magarey et al., 2009)	44.
9.3. Healthy Home Survey (HHS; Bryant et al, 2008)	45.
9.4. Family Food Environment Questionnaire (FFE; Campbell et al,	
2006)	47.
9.5. Parental Self Efficacy for Child diet (PSEC).	48.
10. Data Analysis	
10.1.Sample size/power estimate.	49.
10.2. Sample characteristics and participant reports of parental	
influences and child dietary intake.	
10.3. Examining the psychometric properties of the instruments used	50.
10.4. Analyses undertaken to address the research questions and test	
hypotheses	51.
1. Ethics Approval	54.
ılts	55.
2. Sample Characteristics	55.
3. Parent self-report of self-efficacy, use of parent control strategies in	
feeding, availability and accessibility of foods and child dietary intakes	56.
4. Scale properties of the Parental Self Efficacy for Child diet (PSEC) scale	57.
5. Are there relationships between parental feeding practices, home food	
environment and child diet?	59.
6. Are there relationships between parental self-efficacy and parental feeding	
practices, home food environment, and, child diet?	61.
7. Parental self-efficacy, home food environment and parental feeding	
practices as predictors of child diet	62.
17.1. Fruit and Vegetable Index.	62.
17.2. Fat from Dairy Index	63.
17.3. Sweetened Beverage Index.	64.
17.4. Non-core Foods Index.	65.
8. Do parental feeding practices and home food environment mediate the	
relationship between parental self-efficacy and child diet?	66.

18.1.Fruit and Vegetable Index67
18.2. Non-core Foods Index
19. Can any variables be identified which act as moderators of the
relationships between parental self-efficacy, home food environment,
parental feeding practices and child diet?72
19.1. Fruit and Vegetable Index as the outcome measure for moderation
analyses73
19.2. Fat from Dairy Index as the outcome measure for moderation
analyses74
19.3. Sweetened Beverage Index as the outcome measure for moderation
analyses75
19.4. Non-core Food Index as the outcome measure for moderation
analyses76
Discussion
20. Relationships between home food environment and child diet78.
21. Relationships between parental use of control strategies and child diet82.
22. Parental self-efficacy for child diet: relationships with child diet, home food
environment and parental feeding practices
23. Parental feeding practices and home food environment as mediators of the
relationship between parental self-efficacy and child diet
23.1. Fruit and Vegetable Intake as the outcome measure in multiple
mediation analyses
23.2. Non-core Food Intake as the outcome measure in multiple
mediation analyses
23.3. Fat from Dairy and Sweetened Beverage Intakes: not suitable for multiple
mediation analyses
24. Can any variables be identified which act as moderators of the relationships
between parental self-efficacy, home food environment, parental feeding
practices and child diet?94
24.1. Moderators for child fruit and vegetable intake
24.2. Moderators for child non-core food intake

24.3. Moderators for child fat from dairy and sweetened beverage intakes	97.
25. A brief summary of findings related to the five research questions	99.
26. Some implications for practice and research	101.
27. Study limitations and strengths	104.
28. Conclusions	108.
References	110.
Appendices	139.
Appendix A: Egger and Swinburn (1997) influences on diet and	
physical activity and an ecological model	139.
Appendix B: Full baseline survey uploaded into the CATI system	141.
Appendix C: Full items of the PSEC	194.
Appendix D: The Parenting Sense of Competency Scale	195.
Appendix E: Correlates of parent and child demographic variables	196.
Appendix F: Magarey et al.'s (2009) Child Dietary Questionnaire (CDQ)	
cut off scores for meeting NHMRC dietary guidelines for healthy diet	198.

### List of Tables

Table 1: Summary of studies which demonstrate direct, mediating and
moderating relationships between parental self-efficacy, home food
environment, parental controlling feeding practices and child dietary intakes
Table 2: Relative Validity of CDQ subscales including Spearman correlations,
bias, limits of agreement and regression slope measures reproduced from
Magarey et al., (2009)45.
Table 3: Participant Demographic Information. 55.
Table 4: Descriptive statistics for non-demographic dependent and independent
variables56.
Table 5: Frequency data for non-demographic categorical variables
Table 6. Results of Principal Axis Factoring with Direct Oblimin Rotation for
the PSEC
Table 7: Pearson Correlations between Child Dietary, Environmental and
Parental Factors
Table 8: Pearson Correlations between Parental Self Efficacy measures and
Environmental and Parental Factors61.
Table 9: Stepwise and Backward Regression final model results for the FVI not
including demographic predictors (Model 1) and including demographic predictors
(model 2)63.
Table 10: Stepwise and Backward Regression final model results for the FDI not
including demographic predictors64.
Table 11: Stepwise and Backward Regression final model results for the SBI not
including demographic predictors (Model 1) and including demographic predictors
(model 2)
Table 12: Stepwise and Backward Regression final model results for the NCFI
not including demographic predictors (Model 1) and including demographic predictors
(model 2)
Table 13: Bootstrapping results and normal theory tests for multiple mediation
model for CDQ FVI69.
Table 14: Bootstrapping results and normal theory tests for multiple mediation

model for CDQ NCFI	72.
Table 15: Individually calculated interaction effects using significant predictors	
and selected potential moderators for FVI	74.
Table 16: Individually calculated interaction effects using significant predictors	
and selected potential moderators for FDI	75.
Table 17: Individually calculated interaction effects using significant predictors	
and selected potential moderators for SBI	76.
Table 18: Individually calculated interaction effects using significant predictors	
and selected potential moderators for NCFI	77.
Table A1: Physical, economic and socio-cultural environment influences on diet	
and physical activity (adapted from Egger & Swinburn, 1997)	139.
Table E1: Pearson Correlations between Parent Demographics and Dietary,	
Environmental and Parental variables	196.
Table E2: Pearson Correlations between Child Demographics and Dietary,	
Environmental and Parental variables.	197.
Table F1: Magarey et al.'s (2009) Child Dietary Questionnaire (CDQ) cut off	
scores for meeting NHMRC dietary guidelines for healthy diet	198.

# List of Figures

Figure 1: Model of parenting including practices and styles and their influence	
of child eating (behaviour, preferences, intake) and child weight taken from	
Ventura and Birch (2008)17	7.
Figure 2: Golan & Weizman's (2001) model of child obesity treatment	
involving parent and family intervention targets	•
Figure 3: Model reproduced from Kratt et al. (2000) representing the	
Relationships between parent and child psychological variables and fruit and	
vegetable intake for home food environments where fruit and vegetables are	
of Medium/High availability vs low availability	•
Figure 4: EnRG framework model proposed by Kremers et al. 2006	•
Figure 5: Proposed mediating and moderating relationships to be examined in	
this study	•
Figure 6: Scree plot of eigenvalues for the PSEC	).
Figure 7: Multiple Mediation Model for the Fruit and Vegetable Index where	
paths marked* p<.05 and paths marked ** p<.0168	3.
Figure 8: Multiple Mediation Model for the CDQ Non-core Food Index where	
paths marked $* p < .05$ , paths marked $** p < .01$ and paths marked bs (borderline	
significant) .1>p>.05	
Figure A1: An ecological model of obesity which takes into account biological,	
behavioural and environmental factors from Egger and Swinburn's (1997)	
discussion of environmental influences on diet and physical activity	).

#### Abstract

*Background:* Significant health consequences in adulthood and childhood are related to poor diet quality (National Health and Medical Research Centre, 2003a). Dietary patterns developed in childhood often persist into adulthood (Lau, Quadrel & Hartman, 1990) and parents are among the most important influences on the development of dietary patterns in childhood (Birch & Fisher, 1998). This study aimed to explore relationships between parental factors that impact upon child dietary intakes. Method: Cross-sectional data was collected by telephone interview for 202 parents of children aged 3-5 attending preschools in the Greater Newcastle Area, New South Wales, Australia. Multiple mediation analyses (Preacher & Hayes, 2008) were conducted to examine for indirect and direct effects of parental self-efficacy for managing child diet, through availability and accessibility of fruits vegetables and other foods and use of parental control strategies on four child dietary intakes (fruit and vegetables, fat from dairy, sweetened beverages and non-core foods). In addition, parent socio-economic status and child gender were examined as potential moderators. *Results:* This study found significant mediation effects of fruit and vegetable availability and parental control strategies on the relationships between parental selfefficacy for managing child diet and child fruit and vegetable intake and non-core food intakes. Moderation effects were found for the relationships between child non-core food intake with parental use of restriction and parental self-efficacy respectively. Surprisingly, fruit and vegetable availability were significant moderators rather than the expected parent and child demographic factors of socio-economic status or child gender. Conclusions: This study provides support for significant direct and indirect effects of parental self-efficacy on child intakes of fruit and vegetables and non-core foods. Furthermore, moderation effects found for child non-core food intake are supportive of a displacement effect of child fruit and vegetable intake on non-core food consumption. Parental self-efficacy is an important target for family based interventions to improve child diet and prevent poor dietary outcomes.