



BEATS Study Symposium 2016 Proceedings

BEATS Study Research Team

Thursday, 21 July 2016

**School of Physical Education, Sport and Exercise Sciences
University of Otago
Dunedin, New Zealand**



www.otago.ac.nz/beats

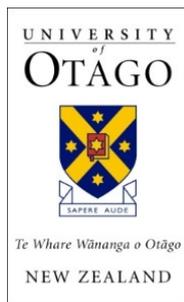
Acknowledgments

The BEATS Study is a multidisciplinary and multi-sector collaboration between the University of Otago, the Dunedin Secondary Schools' Partnership and the Dunedin City Council.

The BEATS Study has been funded by Health Research Council, National Heart Foundation of New Zealand, Lottery Health Research Grant, University of Otago Research Grant, Dunedin City Council and internal grants from the School of Physical Education, Sport and Exercise Sciences.

The BEATS Research Team would like to express the gratitude to all project team members, advisory board members, external collaborators, study coordinators, research assistants, students, volunteers, schools, and study participants for their time and contributions to the BEATS Study.

Finally, we would like to thank the School of Physical Education, Sport and Exercise Sciences for funding this symposium.



BEATS Study Symposium 2016 Proceedings
Author: BEATS Study Research Team
Publisher: University of Otago, Dunedin, New Zealand
Publication date: July 2017

Available on the Active Living Laboratory website:
www.otago.ac.nz/active-living

ISBN: 978-0-473-36213-3

Table of Contents

BEATS Research Team	4
BEATS Study Symposium 2016 Programme	6
Abstracts.....	7
Clustering of (Un)Healthy Behaviours and Weight Status in New Zealand Adolescents	8
Factors that Influence Walking to School among Adolescents in Dunedin	9
Adolescents' Perceptions of Cycling versus Walking to School: Understanding the New Zealand Context	10
Is Walking to School Enough to Achieve Recommended Levels of Physical Activity for Adolescents?.....	11
How Heavy are School Bags of Dunedin's Secondary School Students?.....	12
Parental Perceptions Favour Walking Compared to Cycling to School in Adolescents: Preliminary Findings from Dunedin, New Zealand.....	13
Perceptions of Cycling amongst High School Students and Their Parents	14
A Tale of Two New Zealand Cities: Influences on Cycling to High School in Christchurch and Dunedin	15
The Misfits: Adolescents Who Should Use Active Transport to School, But Don't ...	16
Attitudes Towards Cycle Skills Training in New Zealand Adolescents	17
Visualising Active Transport to School Route Data for Dunedin	18
Routes to Dunedin Secondary Schools and Adolescents' Perceptions of Safety along the Route	19
Parental Perceptions of Driving and Taking a Bus to School: Why or Why Not?.....	20
Adolescents and Their Aspirations for Motorised Transport	21
Students' and Parental Perspectives on School Choice: Who Decides and Which Factors Influence the Decision?	22
Enrolling in the Closest School within Walkable Distance - or Not? Factors Influencing School Choice	23
Implications of School Choice on Transport to School: Results of a Simulation of Closest School Enrolment in Dunedin	24
How to Get Involved.....	25
BEATS Study Publications to Date	26
Short Biographies of the BEATS Research Team Members	28
Contact Details	31

BEATS Research Team

Principal Investigator:

Dr Sandy Mandic, School of Physical Education, Sport and Exercise Sciences, University of Otago

Associate Investigators:

Dr Antoni Moore, School of Surveying, University of Otago

Dr John Williams, Department of Marketing, University of Otago

Dr Debbie Hopkins, Transport Studies Unit, School of Geography and the Environment, University of Oxford, United Kingdom

Prof John C Spence, Faculty of Physical Education and Recreation, University of Alberta, Edmonton, Canada

Dr Enrique García Bengoechea, Participatory Research at McGill, McGill University, Montreal, Canada

Mrs Charlotte Flaherty, Safe and Sustainable Transport Coordinator, Dunedin City Council

Dr Jillian Frater, Canterbury University, Christchurch

Advisory Board:

Mr Gordon Wilson, Chair, Dunedin Secondary Schools' Partnership

Dr Susan Sandretto, Senior Lecturer, College of Education, University of Otago

Mr Andrew Lonie, Recreation Planning Officer, Dunedin City Council

Ms Ruth Zeinert, Project Manager, Getting Dunedin Active (2013-2016)

Dr Tara Duncan, Lecturer, Department of Tourism, University of Otago

Dr Janet Stephenson, Director, Centre for Sustainability: Agriculture, Food, Energy, Environment, University of Otago

Research Students:

Kek Chiew Ching (Master's student)

Leiana Sloane (Honours student)

Lauren Keaney (Honours student)

Tessa Pocock (Summer research student)

Alex Mintoft-Jones (Summer research student)

Ashley Mountfort (Summer research student)

Research Assistants:

Judith Rodda, PhD
Daniela Aldabe, PhD
Alex Mintoft-Jones
Tessa Pocock
Emily Brook, BSc PGDip
Candice Perring, BPhEd
Daria Gibbons, BSc
Ashley Mountfort, BSc
Hayley Horwood, MPhEd
Claire Hodge, PGDip
Angela Findlay, PhD student
Chelsea Cunningham, BPhEd
Madeep Kaur, PhD student
Lizhou Liu, PhD student
Priya Kannan, PhD student
Arum Balasundaram, PhD student
Kareem Diab, PhD
Manal Aziz, PhD

Volunteers:

Dana Lawrie
Susie Ferkins
Paige Clarke
Megan Mendenhall
Shanyn Ruthe
Nicole O'Loughlin
Edee Harris
Brady Gore
Zoe Willis
Kayla Inwood
Julia Flett
Sam Babe
Dayne Tiffany
Aliesha Shutte
Rachel Storer
Nykia Miles
Tegan McNeish
Paige Aichenson
Alana Cannistraci
Luiza Gheorghe

BEATS Study Symposium 2016 Programme

Thursday, 21 July 2016

School of Physical Education, Sport and Exercise Sciences, Seminar Room 213/214
University of Otago, Dunedin, New Zealand

Time	Speaker	Title
8:30am		Registration with tea & coffee
9:00 am		Welcome
9:05 am	Dr Sandra Mandic	Clustering of (Un)Healthy Behaviours and Weight Status Factors that Influence Walking to School among Adolescents in Dunedin Adolescents' Perceptions of Cycling versus Walking to School: Understanding the New Zealand Context
9:30 am	Dr Daniela Aldabe	How Heavy are School Bags of Dunedin's Secondary School Students?
9:45 am	Kek Chiew Ching	Is Walking to School Enough to Achieve Recommended Levels of Physical Activity for Adolescents?
10:00 am	Garrick Hatley	Parental Perceptions Favour Walking Compared to Cycling to School in Adolescents: Preliminary Findings from Dunedin
10:15 am	Dr Debbie Hopkins	Perceptions of Cycling amongst High School Students and Their Parents
10:30 am		Morning tea
10:45 am	Dr Jillian Frater	A Tale of Two New Zealand Cities: Influences on Cycling to High School in Christchurch and Dunedin
11:00 am	Tessa Pocock	Attitudes Towards Cycle Skills Training in New Zealand Adolescents
11:15 am	Dr John Williams	The Misfits: Adolescents Who Should Use Active Transport to School, But Don't
11:30 am	Dr Judy Rodda	Routes to Dunedin Secondary Schools and Adolescents' Perceptions of Safety along the Route
11:45 pm	Dr Antoni Moore	Visualising Active Transport to School Data for Dunedin
12:00 pm		Light lunch
12:45 pm	Dr Debbie Hopkins	Adolescents and Their Aspirations for Motorised Transport
1:00 pm	Dr Sandra Mandic	Parental Perceptions of Driving and Taking a Bus to School: Why or Why Not?
1:10 pm	Dr Susan Sandretto	Students' and Parental Perspectives on School Choice: Who Decides and Which Factors Influence the Decision?
1:25 pm	Dr Sandra Mandic	Enrolling in the Closest School within Walkable Distance - or Not? Factors Influencing School Choice Implications of School Choice on Transport to School: Results of a Simulation of Closest School Enrolment in Dunedin
1:45 pm		Discussion and feedback
2:00 pm		Symposium closes
2:00 pm		Informal discussions and light refreshments

BEATS Study Symposium 2016

Abstracts



www.otago.ac.nz/beats

Clustering of (Un)Healthy Behaviours and Weight Status in New Zealand Adolescents

Sandra Mandic, Enrique García Bengoechea, John C. Spence.

Background: Forming healthy habits during adolescence is essential for setting the stage for healthy behaviours in adulthood. This study examined clustering of health behaviours (physical activity [PA] habits, screen time, fruit and vegetable [F&V] intake) and weight status in New Zealand adolescents.

Methods: Adolescents from all 12 secondary schools in Dunedin (New Zealand) (n=1,300; 49.0% male; age: 15.3±1.4 years) completed an online questionnaire. Participants self-reported PA, screen time outside school, and F&V intake. Height and weight were measured. Analysis included a two-step cluster analysis.

Results: Less than one third of adolescents met current national guidelines for PA (17.9%), screen time (14.2%), or F&V intake (29.8%). Only 2.5% met all three guidelines and 86.3% had multiple risk behaviours. Weight status was 3.2% underweight, 69.6% normal weight, 20.5% overweight and 6.8% obese. Six clusters were identified: 1) non-compliant (not meeting any of the three guidelines) adolescents with healthy weight (38.8%) 2) non-compliant adolescents with unhealthy weight (15.4%); 3) semi-compliant (meeting some guidelines) adolescents with unhealthy weight (11.8%); 4) physically active with healthy weight (13.4%); 5) low screen time with healthy weight (7.1%) and 6) healthy F&V intake with healthy weight (13.5%).

Conclusion: More than half of adolescents in Dunedin (New Zealand) did not meet any recommended guidelines for PA, screen time and F&V intake, and a substantial portion of these had healthy weight. The findings have implications in terms of the relevance of current guidelines for adolescents. Identifying clusters of adolescents based on selected characteristics could help tailor future health promotion interventions.

Keywords: Adolescents, health behaviours, physical activity, healthy eating, screen time, weight status

Related abstract presented at the American College of Sports Medicine Annual Meeting in San Diego, CA, USA in May 2015.

Factors that Influence Walking to School among Adolescents in Dunedin

Sandra Mandic, Enrique García Bengoechea, John Williams, Charlotte Flaherty, Antoni Moore, Debbie Hopkins, John C. Spence.

Background: Multiple factors influence rates of walking to school (WTS). This study examined personal, social and environmental correlates of WTS among Dunedin adolescents.

Methods: Adolescents ($n=1,090$; 15.3 ± 1.5 years; 45.6% boys; using single mode of transport to school) from 12 secondary schools completed an online survey about transport to school, perceptions of WTS and the Neighbourhood Environment Walkability Scale for Youth (NEWS-Y) questionnaire (9 NEWS-Y factors determined using principal component analysis with a varimax rotation). Distance to school was determined using Geographic Information Systems network analysis. WTS correlates were examined using Proportional Odds Logistic Regression with school as a cluster variable. Odds ratios are reported by quartiles.

Results: Overall, 28.7% of adolescents regularly walked to school. Average distance to school was 6.2 ± 7.6 km. Positive multivariate correlates of WTS were parental encouragement [OR (95%CI): 5.83 (3.84, 8.85)], peers walking to school [1.33 (1.06, 1.67)], opportunity to socialize with friends [1.63 (1.44, 1.85)], WTS perceived as interesting [1.35 (1.10, 1.66)], low neighbourhood traffic speed/volume [1.31 (1.11, 1.53)] and uninteresting route to school [1.59 (1.21, 2.10)]. Negative multivariate correlates were greater distance [0.04 (0.02, 0.07)], perceived convenience of being driven to school [0.57 (0.43, 0.75)], WTS taking too much time [0.60 (0.43, 0.84)], an after-school schedule [0.43 (0.29, 0.64)] and lack of interest [0.73 (0.63, 0.85)].

Conclusions: Taking into account distance and time constraints, beliefs about WTS and traffic safety were important correlates of WTS among adolescents in Dunedin. Positive parental and peer support could be effective routes for intervention.

Keywords: Adolescents; walking; school; barriers; social support; built environment; traffic safety

Related abstract accepted for a presentation at the International Congress on Physical Activity and Public Health in Bangkok, Thailand in November 2016.

Adolescents' Perceptions of Cycling versus Walking to School: Understanding the New Zealand Context

Sandra Mandic PhD, Debbie Hopkins, Enrique García Bengoechea, Charlotte Flaherty, John Williams, Leiana Sloane, Antoni Moore, John C. Spence.

Background: Cycling to school is less common than walking in many developed countries. This cross-sectional study compared perceptions of walking versus cycling to school in Dunedin adolescents living ≤ 4 km from school.

Methods: Adolescents ($n=764$; 44.6% males; 15.2 ± 1.4 years) from 12 secondary schools completed an online survey about perceptions of walking and cycling to school. Distance to school was calculated using Geographic Information Systems network analysis.

Results: Overall, 50.8% of adolescents walked and 2.1% cycled to school, 44.1% liked cycling for recreation and 58.8% were capable/able/confident to cycle to school. Adolescents expressed more positive experiential (walking: 45.9%; cycling: 34.9%) and instrumental beliefs (walking: 74.2%; cycling: 59.2%) towards walking versus cycling to school ($p<0.001$). Compared to walking, adolescents reported that cycling to school was perceived as less safe by themselves (cycling vs walking; 61.3% vs 89.8%) and their parents (71.4% vs 88.6%) and was less encouraged by their parents (23.0% vs 67.0%), peers (18.8% vs 48.4%) and schools (19.5% vs 30.8%) (all $p<0.001$). The route to school had fewer cycle paths compared to footpaths (37.2% vs 91.0%; $p<0.001$). Cycle friendly uniforms (41.4%), safer bicycle storage at school (40.1%), slower traffic (36.4%), bus bicycle racks (26.2%) and bicycle ownership (32.7%) would encourage cycling to school.

Conclusions: Compared to walking, cycling to school among Dunedin adolescents was less common, perceived as less safe and had less social and infrastructure support. Future interventions should focus on creating supportive physical and social environments, and improving road safety for cyclists in New Zealand.

Keywords: Adolescents, active transport, walking, cycling, attitudes, perceptions, social support, environment

Related abstract accepted for a presentation at the International Congress on Physical Activity and Public Health in Bangkok, Thailand in November 2016.

Is Walking to School Enough to Achieve Recommended Levels of Physical Activity for Adolescents?

Kek Chiew Ching, Enrique García Bengoechea, John C. Spence,
Sandra Mandic.

Purpose: Using active transport (AT) to school has been associated with a higher level of moderate-to-vigorous physical activity (MVPA) compared to motorized transport (MT) in adolescents. This study compared MVPA during weekdays, before/ after school, and on weekend days in adolescents using AT, MT or combined active and motorized transport (AT+MT) to school.

Methods: Adolescents (n=314; age: 14.7±1.4 years; 32.8% boys) from 12 schools in Dunedin (New Zealand) wore an accelerometer for 7 days (≥3/≥1 valid weekdays/weekend days) and self-reported travel to school.

Results: Transport modes to school included 58.9% MT, 23.2% AT and 17.8% AT+MT. Overall, 39.2% of adolescents met physical activity guidelines (AT: 47.9%, AT+MT: 46.4%, MT: 33.5%, $p<0.048$). Compared to MT, AT engaged in more MVPA/day (AT: 61.2±22.4, MT: 54.4±19.1 min, AT+MT: 63.2±21.9, $p<0.05$ AT vs MT) and MVPA/weekday (AT: 63.5±21.6, MT: 53.9±18.6 min; AT+MT: 64.1±23.3, $p<0.05$ AT vs MT). Before school MVPA (08:00am-09:00am) was highest in AT and lowest in MT (AT: 12.7±7.2, AT+MT: 9.8±6.7, MT: 5.6±4.3 min; $p<0.05$ for all comparisons). After school (3:00pm-4:00pm), AT engaged in more MVPA compared to other groups (AT: 13.3±6.4, AT+MT: 9.9±5.3, MT: 8.4±5.1min; $p<0.05$ vs. AT). No differences in MVPA between the groups were observed on weekday afternoons/evenings (4:00pm-8:00pm) or on weekend days.

Conclusion: AT accumulated more MVPA during the commute time to and from school compared to MT and AT+MT, but on average engaged in 26 min of MVPA during the commute time. Other physical activity opportunities should complement AT to school.

Keywords: Adolescents, physical activity, active transport, accelerometers

Related abstract accepted for a presentation at the International Congress on Physical Activity and Public Health in Bangkok, Thailand in November 2016.

How Heavy are School Bags of Dunedin's Secondary School Students?

Daniela Aldabe, Sandra Mandic.

Background: To reduce the risk of developing musculoskeletal disorders, the current recommendations state that school bag weights in children and adolescents should not exceed 10%-15% of the body weight. This study examined school bag weights in adolescents attending a secondary school in Dunedin.

Methods: A total of 467 adolescents (age: 15.2 ± 1.3 years; 56.3% boys; non-boarders) completed an online survey and anthropometry measurements (height, weight) and had their full school bag measured (absolute weight and normalized by body weight).

Results: The average school bag weight was 5.1 ± 2.1 kg (range: 0.8 kg to 12.9 kg) representing $9.1 \pm 3.9\%$ of the adolescents' body weight (range: 1.4% to 29.3%). In 34.3% of adolescents, the school bag weights exceeded 10% of the body weight (90.1% of underweight adolescents; 39.9% of normal weight adolescents). In 6.4% of adolescents, school bag weights exceeded 15% of the body weight (36.4% of underweight adolescents). School bag were heavier for boys versus girls (boys: 5.6 ± 2.1 kg, $9.7 \pm 4.3\%$ body weight; girls: 4.7 ± 1.6 kg; $8.2 \pm 3.1\%$ body weight; both $p < 0.001$) and in adolescents' boys attending e-schools versus traditional schools (e-schools: 8.1 ± 2.3 kg; traditional school: 5.3 ± 1.8 kg; $p < 0.001$; no data in girls). No significant differences in school bag weight were found among adolescents using different modes of transport to school (active: 5.3 ± 2.1 kg; motorized: 5.4 ± 1.9 kg; combined transport: 5.6 ± 2.1 kg; $p = 0.388$).

Conclusion: In one third of adolescents, school bag weights exceeded the recommended threshold. Underweight and normal weight adolescents, especially boys, and those attending e-schools are particularly at an increased risk of developing musculoskeletal disorders.

Keywords: Adolescents; school bag; school bag weight

Parental Perceptions Favour Walking Compared to Cycling to School in Adolescents: Preliminary Findings from Dunedin, New Zealand

Garrick Hately, Debbie Hopkins, Enrique García Bengoechea, John Williams, Charlotte Flaherty, John C. Spence, Sandra Mandic.

Background: Parental perceptions influence how adolescents travel to school. This cross-sectional study compared parental perceptions of adolescents' walking versus cycling to school.

Methods: Thirty-nine parents (age: 48.6 ± 6.0 years; 84% females; living ≤ 4 km from their child's school) from Dunedin, completed an online survey on their children's (age: 13-18 years) transport to school habits and parental perceptions of walking and cycling to school.

Results: Most common modes of children's travel to school were walking (53.8%), being driven (25.6%) and cycling (12.8%). Compared to walking, parents perceived cycling to school as more unsafe (5.1% walking, 35.9% cycling) and less desirable (76.9% walking, 35.9% cycling), provided less encouragement for cycling (56.4% walking; 28.2% cycling) and preferred their child not to cycle to school (10.3% walking; 56.4% cycling) (all $p < 0.001$). Many parents believed that decisions about their child's walking or cycling to school should be made by parents only (40.7%) or parents and adolescents together (40.7%). Overall, 38.5% could not estimate the time required to cycle to school and 12.8% did not allow their child to leave home alone with a bicycle. Although half of parents (56.4%) perceived that their child had very good/excellent cycling skills, 71.8% believed their child would benefit from cycle skills training.

Conclusions: Perceptions of safety and parental preferences about adolescent's transport behaviours favoured walking compared to cycling to school. Combined with the perceived parental responsibility in decision making about walking or cycling to school, parental influences may in part explain low rates of cycling to school in Dunedin.

Keywords: Parents; adolescents; travel to school; walking; cycling; perceptions; decision making

Perceptions of Cycling amongst High School Students and Their Parents

Debbie Hopkins and Sandra Mandic

Background: Cycling is a healthy, low-cost, and low-carbon alternative to motorised transport. As a relatively fast active mode of transport, cycling can overcome the distance barrier of walking, whilst also providing cardiovascular exercise and reducing demand for motor vehicle travel. The 'cycling renaissance' has seen an increase in the number of cyclists in urban spaces, and there is evidence of increased investment in cycling infrastructure and cycle skills training in some places. Yet the number of high school students cycling to school is declining in many industrialised countries. Transport to school is a major contributor to daily traffic congestion, resulting in both local and global environmental concerns. High school students have been relatively overlooked in cycling research to-date.

Method: We present the empirical findings from a qualitative study of high school students (n=54; 10 focus groups) and parents (n=25; 6 focus groups) in Dunedin, Aotearoa New Zealand. Focus group sessions were conducted during 2014-2015 with students and parents separately, to explore their perceptions of transport to school decisions and modes of travel.

Results: Key findings relate to perceived safety, implicit messages, and social norms. We find that a complex range of factors contribute to perceptions of cycling safety, including features and perceptions of the built environment, traffic safety (including behaviours of other road users), previous cycling experiences (including accidents) and adolescents' cycling skills and on-road experiences.

Conclusions: Overcoming concerns through behavioural and cultural interventions coupled with skill development and thoughtful infrastructure may present a pathway to increasing rates of cycling.

Keywords: Cycling; transport to school; qualitative research; New Zealand; safety; parents; students

A Tale of Two New Zealand Cities: Influences on Cycling to High School in Christchurch and Dunedin

Jillian Frater, Sandra Mandic, John Williams, Debbie Hopkins, Charlotte Flaherty, Antoni Moore

Background: In recent decades, New Zealand transport to school has been characterised by increased rates of driving, and reduced rates of active and public transport, with some regional differences. This study compared attitudes, injunctive norms (what people ought to do), descriptive norms (what people do), perceived behavioural control, intention and past behaviour of cycling to school in Christchurch and Dunedin adolescents.

Methods: Adolescents (n=803; school years 9, 11 and 13; living ≤ 4 km from school; non-boarders) from Dunedin (n=430; 12 schools; population: 120,249) and Christchurch (n=373; 7 schools; population: 348,459) were surveyed about cycling to school.

Results: Compared to Christchurch, Dunedin's sample was older (15.0 ± 1.6 versus 14.3 ± 1.6 years; $p < 0.001$) with more females (55% versus 37%; $p < 0.001$) whereas average distance to school did not differ (1.9 ± 1.0 km). Unlike Christchurch, fewer Dunedin adolescents cycled to school (2% vs 18%; $p < 0.001$) and more were driven to school (38% vs 17%; $p < 0.001$). Although both samples scored similarly for attitudes towards cycling to school, the Dunedin sample scored lower for all measures of injunctive norm (parents: 3.3 ± 1.9 vs 4.3 ± 2.0 ; friends: 3.3 ± 1.9 vs 4.0 ± 1.9), descriptive norm (parents: 1.8 ± 1.7 vs 2.4 ± 2.0 ; friends: 0.3 ± 0.7 vs 1.7 ± 1.6), perceived behavioural control (confidence/capability/ability score: 4.7 ± 2.1 vs 5.7 ± 1.2 ; autonomy: 5.3 ± 2.0 vs 5.8 ± 1.7), and intention (1.5 ± 1.3 vs 2.7 ± 2.2) with respect to cycling to school (all $p < 0.001$).

Conclusions: Despite similar attitudes, differences in the influence of injunctive and descriptive norms (for both parents and friends), perceived behavioural control and intention may in part explain lower rates of cycling to school in Dunedin versus Christchurch adolescents.

Keywords: Adolescents; transport to school; cycling; Theory of Planned Behaviour; attitudes; social support

Related abstract presented at the Energy Cultures Conference in Wellington, New Zealand, in July 2016.

The Misfits: Adolescents Who Should Use Active Transport to School, But Don't

John Williams.

Background: A model of students who use of active transport (AT) versus motorised transport (MT) has been described elsewhere in this symposium. Of the 308 students who were predicted to use AT, 43 (14%) used MT. Is this just random error, or is there something that *systematically* differentiates the between the “fits” and the “misfits” of this model?

Methods: Student's *t* test and the Mann-Whitney-Wilcoxon *U* test were used to examine the differences in the covariates, including those eliminated from the final model.

Results: Misfits were likely to live further from school, and hence perceive that the school is too far and it would take too much time to use AT; agree that they often cannot be bothered to use AT; did not have friends that encouraged AT; often felt too tired to use AT; and agreed that they got driven to school because their parents do not encourage AT. The injunctive norm of friends and tiredness factors were eliminated from the model at an early stage, and when they are added back they remained non-significant. While these variables cannot differentiate between using AT or MT on the journey to school, they *can* strongly differentiate between the fits and misfits.

Conclusions: Apart from factors directly related to distance, the major factors for differentiating “fits” from “misfits” were injunctive norms, tiredness and convenience. Hence it appears that lifestyle factors leading to tiredness, as well as peer support, may be fruitful avenues to explore for policy interventions.

Keywords: Logistic regression; Goodness of fit; misfits; adolescents; transport to school; active transport

Attitudes Towards Cycle Skills Training in New Zealand Adolescents

Charlotte Flaherty, Tessa Pocock, Alex Mintoft-Jones, Jillian Frater, Palma Chillón, Enrique García Bengoechea, Sandra Mandic.

Background: Cycle skills training (CST) increases cycling skills in children. Whether CST could be beneficial to adolescents and whether adolescents would be interested in taking on such training remains unknown. This study examined correlates of adolescents' perception that CST could make them safer in traffic.

Methods: A total of 1,453 adolescents (age: 15.1±1.4 years; 44.9% boys) from 12 secondary schools in Dunedin (New Zealand) participating in the BEATS Study completed an online survey in 2014-2015. Questions assessed demographics, travel to school habits, attitudes towards cycling and CST, normative beliefs, perceived behavioural control and behavioural intention for cycling to school. Data were analysed using linear mixed models.

Results: Out of 38.5% of adolescents who perceived that CST could make them safer in traffic, nearly half would take CST at their school (43.1%). In a multivariate analysis, enjoying cycling for recreation, perceiving cycling to school as being useful, cycling frequently with parents, school's encouragement, and desire to cycle to school were positively associated with adolescents' perception that CST could make them safer in traffic (all $p < .05$).

Conclusions: Enjoyment of cycling for recreation, finding cycling to school useful, desire to cycle to school, frequent cycling with parents, and encouragement from schools were associated with favourable perceptions of CST in adolescents. Therefore, raising adolescents' awareness of the benefits of CST and potentially offering such training in secondary schools could be beneficial. Future interventions should involve parents and schools and aim to increase adolescents' interest in taking CST at school.

Keywords: Adolescents; cycling; cycle skills; cycle skills training; safety; attitudes; perceptions

Related abstract accepted for a presentation at the International Congress on Physical Activity and Public Health in Bangkok, Thailand in November 2016.

Visualising Active Transport to School Route Data for Dunedin

Antoni Moore, Judith Rodda, Sandra Mandic.

Background: It is now commonplace for spatial data to be generated in high volume with high velocity, variety and veracity. These form the 'four Vs', commonly held characteristics of Big Data. These data therefore form a challenge for both analysis and visualisation. The BEATS study has generated a large amount of space-time route data and this paper will feature visualisation techniques that perform the representation task effectively.

Data: Adolescents from the 12 Dunedin schools (n=1,463; age: 15.1±1.4 years; 44.7% boys) provided address data as part of an online survey which was geocoded into coordinate form, subsequently used in Geographic Information Systems network analysis. The product of this was a shortest path route from home to their school for each student. Assumptions about time of travel to and from school (timed to arrive at school at the same time, prior to the first lesson) adds a temporal element to this data.

Results: The data were visualised using spatial (routes arranged and aggregated on a map so that there was no overlap) and spatiotemporal (abstracted in an Adaptive Relative Motion schematic lending emphasis to the temporal and relational elements of the journey; animation) methods.

Conclusions: Using spatial and space-time visualisation can reveal patterns in a complex route dataset (i.e. the BEATS dataset) that would otherwise be hard to make visible or would otherwise be invisible.

Keywords: Geographic Information Systems; network analysis; visualisation; active transport; adolescents

Routes to Dunedin Secondary Schools and Adolescents' Perceptions of Safety along the Route

Judith Rodda, Antoni Moore, Sandra Mandic

Background: Perception of the safety of the route to school is one of the key factors determining whether adolescents use active modes of transport to school. This study examined the spatial distribution of adolescents' routes to schools and the recorded adolescents' observations regarding the perception of 'safety' along those digitised routes.

Methods: High school students (n=740; age: 15.5±1.4 years; 53.4% females) hand drew their route to school on a paper map which was subsequently digitised. Total area encompassed by digitised routes for each school was calculated. Adolescents were asked to mark 'safe' and 'unsafe' areas along the route and provide comments for 'unsafe' segments.

Results: Out of 1462 digitised route to school segments, 347 (23.4%) were marked as 'unsafe'. Adolescents provided comments about safety of the route to school on 235 (67.7%) of 'unsafe' segments (16.1% of all digitised segments). Adolescents comments indicated four distinct perceptions of 'unsafe' areas: 1) built environment characteristics (roads/intersections/lack of footpaths; 118 (50.2%) of unsafe segments; 60.2% females), 2) traffic safety (vehicles/traffic; 93 (39.6%) of unsafe segments; 57.0% females); 3) personal safety (people/dogs/street lighting; 60 (25.5%) of unsafe segments, 55.0% females) and 4) other (weather-dependent/winds/glare; 15 (6.3%) of unsafe segments, 20.0% females).

Conclusions: Built environment features, traffic safety and to a lesser extent personal safety concerns were the main factors influencing Dunedin adolescents' perception of safety along the route to school. Therefore, modifying built environment and addressing traffic safety is necessary for promoting active transport to school in adolescents.

Keywords: Adolescents; route to school; maps; safety; perceptions

Parental Perceptions of Driving and Taking a Bus to School: Why or Why Not?

Sandra Mandic, Charlotte Flaherty, Debbie Hopkins, Enrique García Bengoechea, John C. Spence.

Background: In New Zealand, the rates of driving to school have increased while the rates of walking, cycling and public transport have decreased in the last few decades. This study examined perceptions of driving and taking a bus to school in parents of Dunedin secondary school students.

Methods: Seventy-six parents (age: 48.7 ± 6.2 years; 78.9% females) completed a survey (online or paper) about their adolescents' transport to school and perceptions of driving or taking a bus to school.

Results: Among 49 (64.5%) parents who drove their adolescents to/from school ≥ 1 day/week, most common reasons for driving were convenience of driving to school on the way to something else (79.6%), an adolescent having too much to carry (65.3%), distance to school being too far for walking or cycling (61.2%), time constraints (42.9%), road safety (42.9%) and personal safety (42.9%). The rates of using public/school bus to school were 15.8% most or all of the time, 31.9% sometimes and 51.3% never. Most surveyed parents (88.2%) lived within a 10-minute walk to the closest public bus stop. The most frequently reported barriers to bus use were cost (53.9%), adolescents' activities before/after school (53.9%) and perceived convenience of driving (50.0%), followed by bus trip duration (27.6%) and lack of free-of-charge bus bike racks (27.6%).

Conclusions: Perceived convenience of driving, having too much to carry and distance were the main reasons for Dunedin's parents driving their adolescents to school. Cost, adolescents' out-of-school activities and convenience of driving were main barriers for using school bus or public transport.

Keywords: Adolescents, parents, transport, school, driving, bus, barriers, motivations

Adolescents and Their Aspirations for Motorised Transport

Debbie Hopkins and Sandra Mandic

Background: The need to transition away from the current car-dominated transport system is well documented in climate change, health and transport literatures. Despite growing interest in active and public transport modes, the car still dominates travel preferences for most age groups. There is, however, evidence of declining preferences for car-based travel for younger generations. Adolescents might be less likely to learn to drive and aspire to personal car ownership than earlier generations.

Method: We used empirical material gathered through a multi-method study of high school students in Dunedin, New Zealand to explore the aspirations of adolescents for motorised forms of transport. Drawing from the Theory of Planned Behaviour and the Energy Cultures Framework, we present and interpret findings from a quantitative survey of high school students (n=1373) and qualitative focus groups (n=10 focus groups, 55 participants).

Results: We find evidence of on-going preference for car-based transport, and intentions to learn to drive amongst the cohort. Overall, car-based transport was the preferred mode, either driven by others (46.6%), or driving themselves (28.7%). There was also a clear aspiration to learn to drive, with 19.5% already having a licence, 78.1% wanting to get a licence, and just 2.3% not wanting a licence. Focus group participants articulated a diverse range of motivations for learning to drive, with independence from family, and public transport timetables often cited. There was also strong evidence of parental and family influences in preferences to learn to drive.

Conclusions: Preference for motorised transport amongst adolescents is still strong, and may challenge attempts to encourage the uptake of low-carbon, active transport modes.

Keywords: Adolescents; driving; learning to drive; transport system; youth trends; automobility

Related abstract was presented at the Otago Energy Research Centre annual symposium in November 2015.

Students' and Parental Perspectives on School Choice: Who Decides and Which Factors Influence the Decision?

Susan Sandretto, Sandra Mandic, Gordon Wilson, Debbie Hopkins.

Background: School choice in Aotearoa New Zealand is a complex and contested field, with multiple factors impacting how parents and/or students select a school. The 1989 Education Act and subsequent legislation, which removed school zones, radically reshaped school choice. These school reforms underpinned by neo-liberal ideologies that emphasise the importance of individual choice, resulted in increased stratification between low- and high-decile schools and a culture of parental school choice frequently driven by social factors (e.g. characteristics of the school population) rather than distance to school.

Methods: This paper reports students' and parental perspectives on school choice. Secondary school students (n=1465; 44.7% boys) and parents (n=77; 78.7% females) from 12 secondary schools in Dunedin, New Zealand, completed an online survey about school choice.

Results: Students reported most school choice-decisions were made by students and parents together (46.1%) followed by students only (34.1%), parents/guardians only (19.1%) and others (0.7%). Overall, 45.3% of students enrolled in the closest school. Students' most common reasons for school choice included: preference for co-educational school (68.6%; among students attending co-educational schools), school's facilities (52.3%), positive comments from parents (51.9%) and students (51.3%) from a particular school, school's sports programmes (46.3%) and friends' enrolment (50.7%). Parents' most common reasons for school choice included child's friends' enrolment (69.3%), positive comments from parents (64.0%), cultural (64.0%) and sports programmes (50.7%) and school's facilities (44.0%).

Conclusions: Social factors (friends' enrolment; positive comments) and school programmes/facilities rather than distance to school influence secondary school choice decisions in Dunedin (New Zealand).

Keywords: Secondary schools; school choice; New Zealand; parents; adolescents

Enrolling in the Closest School within Walkable Distance - or Not? Factors Influencing School Choice

Sandra Mandic, Debbie Hopkins, Susan Sandretto, Antoni Moore, Judith Rodda, Gordon Wilson.

Background: Absence of requirements to attend the local school combined with social factors driving school choice diminish the perceived importance of distance to school in school choice decisions. This study compared school choice decisions in Dunedin adolescents living within walkable/non-walkable distance to the closest non-integrated school and enrolling in the closest/distant secondary school.

Methods: Students (n=1,465; age: 15.1±1.4 years; 44.7% boys) from 12 schools completed an online survey about school choice. Distances to schools were calculated using Geographic Information Systems network analysis. Four groups were formed: enrolled in the closest school within walking distance (Walkable-Closest); enrolled in the distant school whereas the closest school was within walking distance (Walkable-Distant); enrolled in the closest school beyond walkable distance (Non-Walkable-Closest) and enrolled in the distant school whereas closest school beyond walking distance (Non-Walkable-Distant).

Results: Demographic characteristics were similar across four groups. Rates of active transport were highest in the Walkable-Closest group (66.6%) compared to three other groups (range: 3.9% to 18.6%). Key drivers of school choice across four groups were preference for a co-educational school (64.2%-76.6%; in students attending co-educational schools only), enrolment of friends (47.8%-55.4%), positive comments from parents (44.0%-58.2%) and students (41.5%-57.0%) and school's facilities (41.6%-59.9%). Distance to school was important for students enrolling in the closest school (63.2%-71.7%). Schools' sports were important consideration for enrolling in the distant school (49.9%-51.3%).

Conclusions: With the exception of school's proximity to home and school sports, similar social factors are influencing adolescents/parental decisions to enrol in the closest/distant school or walkable/non-walkable school.

Keywords: School choice; secondary school; adolescents; parents; distance; enrolment

Implications of School Choice on Transport to School: Results of a Simulation of Closest School Enrolment in Dunedin

Sandra Mandic, Debbie Hopkins, Susan Sandretto, Antoni Moore,
Judith Rodda, Gordon Wilson.

Background: New Zealand legislation does not require students to attend their closest school. With distance to school being the strongest predictor of walking and cycling to school, school choice has significant impact on transport patterns and public health. This study examined the effects of a simulated enrolment in the closest non-integrative school on transport to school in Dunedin adolescents.

Methods: Adolescents (n=1,463; age: 15.1±1.4 years; 44.7% boys) from all 12 Dunedin secondary schools completed an online survey about travel to school and school choice. Distances from home to the current and closest non-integrated school were calculated using Geographic Information Systems network analysis.

Results: Overall, 37.8% of students enrolled in the closest school. Average distance to school was 6.2±7.4 km with 33.3% of students living within walking (≤2,300 m) and 53.0% living within cycling distance to their school (≤4,000 m). Current transport to school included motorized (60.4%), active (24.0%, mostly walking) and combined modes (15.6%). In a simulated enrolment scenario, distance to school decreased to 4.4±6.5 km and proportion of students living with walking and cycling distance increased to 51.4% and 71.9%, respectively. Using the current distance-based transport to school habits, the simulated scenario increased rates of active transport to 33.6% and reduced rates of being driven/driving to school from 45.4% to 37.6%.

Conclusions: Policies that encourage enrolment in the closest school could lead to increased rates of active transport, reduced rates of driving to school and therefore may contribute to addressing obesity epidemic, traffic congestion and sustainability concerns.

Keywords: Secondary school; school choice; adolescents; parents

How to Get Involved...

There are opportunities for academics, parents, students, policy makers, community and sports groups to get involved in the BEATS Study.

RECRUITMENT

Parents

We are currently recruiting for parents of Dunedin secondary school students to participate in the BEATS Parental Survey. Parents can get involved by participating in the study, and sharing it with their friends and relatives.

Community and Sports Groups

Community and sports groups can help us to recruit participants for the parental survey by spreading the word about the study and passing on information through their various networks. Recruitment fliers and materials can be requested from the BEATS Study Coordinator.

RESEARCH

Prospective Postgraduate University Students

Students interested in this field of research should contact Dr Sandy Mandic as there are opportunities for honours, Masters and PhD-level study.

Undergraduate University Students

We are always looking for student volunteers willing to help with the data management. This research experience is a great addition to students' CVs. Anyone interested should contact the BEATS Study Coordinator.

Academics

Academics interested in getting involved in the BEATS Study should contact Dr Sandy Mandic. There are opportunities to expand the study to other cities and we are keen to hear from anyone interested.

DISSEMINATION

Policy Makers

Anyone interested in receiving more information on the findings of the BEATS Study as they become available should register their interest by emailing beats@otago.ac.nz.

BEATS Study Publications to Date

Journal articles

Mandic S, Williams J, Moore A, Hopkins D, Flaherty C, Wilson G, García Bengoechea E, Spence JC. Built Environment and Active Transport to School (BEATS) Study: protocol for a cross-sectional study. *BMJ Open* 2016;6:e011196. doi:10.1136/bmjopen-2016-011196
<http://bmjopen.bmj.com/content/6/5/e011196.full.pdf+html>

Mandic S, Mountfort A, Hopkins D, Flaherty C, Williams J, Brook E, Wilson G, Moore A. Built Environment and Active Transport to School (BEATS) Study: Multidisciplinary and multi-sector collaboration for physical activity promotion. [El estudio *Entorno construido y desplazamiento activo a la escuela (BEATS)*: Colaboración multidisciplinaria y multisectorial para la promoción de la actividad física] Retos: Nuevas tendencias en Educación Física, Deporte y Recreación' ('Challenges: New tendencies in Physical Education, Sport, and Recreation'). Invited article for special edition. 2015; 28:197-202
<http://recyt.fecyt.es/index.php/retos/article/view/34955/19222>

Conference abstracts

(Accepted or presented at national or international conferences)

Mandic S, García Bengoechea E, Chiew Ching K, Spence JC. Physical activity in adolescents using active, motorized or combined active and motorized transport to school: Results from Dunedin, New Zealand. The 6th International Congress on Physical Activity and Public Health, Bangkok, Thailand, November 2016 (Accepted for verbal presentation)

Mandic S, Flaherty C, Pocock T, Mintoft-Jones A, Frater J, Chillón-Garzón P, García Bengoechea E. Attitudes towards cycle skills training in New Zealand adolescents. The 6th International Congress on Physical Activity and Public Health, Bangkok, Thailand, November 2016 (Accepted for verbal presentation)

Mandic S, García Bengoechea E, Williams J, Flaherty C, Moore A, Hopkins D, Spence JC. Individual, social and environmental correlates of walking to school in adolescents from Dunedin, New Zealand. The 6th International Congress on Physical Activity and Public Health, Bangkok, Thailand, November 2016 (Accepted for poster presentation)

Mandic S, Hopkins D, García Bengoechea E, Flaherty C, Williams J, Sloane L, Spence JC. Adolescents' perceptions of walking versus cycling to school: Informing future interventions for promoting cycling to school. The 6th International Congress on Physical Activity and Public Health, Bangkok, Thailand, November 2016 (Accepted for poster presentation)

Frater J, Mandic S, Williams J, Hopkins D, Flaherty C, Moore A. A tale of two cities: Influences on cycling to school in Dunedin and Christchurch. The Energy Cultures Conference, Wellington, New Zealand, July 2016 (Accepted)

Hopkins D, Mandic S. Decarbonising the transport system by promoting active modes: a qualitative investigation. Proceedings of Otago Energy Research Center Symposium 2015, p.22

Mandic S, Sloane L, Flaherty C, García Bengoechea E, Spence J. Adolescents' perceptions of walking versus cycling to school: Informing future interventions for promoting cycling to school. *Proceedings of Otago Energy Research Center Symposium 2015*, p.21

Flaherty C, Mandic S. Cycling habits and cycle skills in Dunedin adolescents: Should cycle skills training be available to New Zealand adolescents?. (Verbal presentation) TRAFINZ Conference, Transport Futures: The Changing Face of Transport, Dunedin, New Zealand (August 2015)

Mandic S, García Bengoechea E, Brook E, Mountfort A, Spence JC. Clustering of (un)healthy behaviours and weight status in New Zealand adolescents. *Medicine & Science in Sports & Exercise*. 2015; 46:(5, Suppl.):S372.

Mandic S, García Bengoechea E, Williams J, Mountfort A, Brook E, Flaherty C, Spence JC. Personal, social and environmental factors influencing adolescents' walking to school in Dunedin, New Zealand. *Medicine & Science in Sports & Exercise*. 2015; 46:(5, Suppl.):S420.

Hopkins D, Mandic S. What factors incentivise or deter learn to drive behaviours for generation Y? Reporting on a study of Dunedin high school students. Otago Energy Research Center Annual Conference, November 2014 (Presented)

Flaherty C, Mountfort A, Mandic S. Attitudes towards cycle skills training in Dunedin adolescents. 2 Walk and Cycle Conference, October 2014, Nelson, New Zealand (Presented)

Mandic S, Hodge C, Flaherty C, Horwood H, Mountfort A, Hopkins D, Brook E, Duncan T. Comparison of sociodemographic, family and environmental factors as motivations and barriers for walking to school among adolescents in Dunedin, New Zealand. *Global Heart*, 2014;9(1, Suppl.):e298-e299 doi:10.1016/j.gheart.2014.03.2305

Hopkins D, Williams J, Mandic S. Changing youth mobility practices: a transformative pathway towards transport efficiency? The Energy Conference 2014, National Energy Research Institute, Wellington, March 2014 (Verbal presentation)

Mandic S, Hodge C, Flaherty C, Horwood H, Mountfort A, Hopkins D, Brook E, Duncan T. Cycling to school among adolescents in Dunedin: Perceptions and barriers. *Proceedings of the New Zealand Sport and Exercise Science Conference*, 2013, pp. 52-53

Mandic S. Built environment and active transport to school: Insights from Otago. *Proceedings of the New Zealand Sports Medicine and Science Conference*, 2013, pp. 22

Hopkins D, Williams J, Mandic S. Adolescent mobility practices: The relationship between attitudes to driving and information communication technologies. *Proceedings of Otago Energy Research Center Symposium*, 2013, pp. 8

Technical Reports

Fourteen technical reports (49-50 pages each) reported findings from the BEATS Student Survey prepared for the individual schools that took part in the study (12 Dunedin secondary schools and 1 Christchurch school) and Dunedin Secondary Schools' Partnership.

Short Biographies of the BEATS Research Team Members

Dr Sandy Mandic is a Senior Lecturer in the School of Physical Education, Sport and Exercise Sciences, University of Otago. Her research expertise is in the area of Physical Activity and Health. Current research encompasses multidisciplinary and multi-sector approach to physical activity and health with implications for transport, urban design and education sectors. Sandy is the primary investigator for the BEATS Study and an academic leader of the Active Living Laboratory at the University of Otago. Sandy has extensive experience in implementation and coordination of research projects, establishing collaborations with local organizations, and working in multidisciplinary research teams.

Dr Antoni Moore - Ph.D. in Geographical Information Science. Tony is a Senior Lecturer at the School of Surveying, University of Otago. His research interests have always included a strong social decision support element, namely the use of technology (Geographic Information Systems (GIS), spatial analysis, geographic visualisation) to help coastal zone managers in the UK, to empower Bluff community members at the grassroots level and latterly to help manage planting of flora with medicinal properties on an Iwi-owned farm on Banks' Peninsula. He has experience in both supervising and conducting questionnaires (and follow up interviews) that elicit both quantitative and qualitative data. More recently, he has been involved with network spatial analysis to provide built environment data for an active transport to school project, in collaboration with Dr Mandic.

Dr John Williams is a Senior Lecturer at the Department of Marketing, School of Business, University of Otago. His research and scholarly interests include research methods and philosophy of science; consumer behaviour; tourism; business ethics and 'social' marketing; and information technology and its impact on business and society. His PhD thesis was about a new statistical technique that combines cluster analysis with structural equation modelling, and he continues to collaborate internationally in this field.

Dr Debbie Hopkins is a Research Fellow in Low Carbon Mobility and Energy Demand at the Transport Studies Unit, School of Geography and the Environment, University of Oxford, United Kingdom. Debbie is an environmental social scientist and human geographer, working on socio-spatial experiences and practices of mobility with a particular focus on socio-technical transitions to a low-carbon transport system. Debbie previously worked at the Centre for Sustainability at the University of Otago on the Energy Cultures II project. Her research interests include modal shift from motorised to active modes, urban freight delivery, and the emergence of automated vehicle technologies. Debbie is an associate investigator on the BEATS Study, leading qualitative investigations of active transport to school.

Prof John C Spence is Associate Dean (Research) in the Faculty of Physical Education and Recreation at the University of Alberta (Edmonton, Canada). He has expertise in measurement, and determinants, of physical activity and sedentary behaviour. His research projects are primarily focused on examining environmental influences on physical activity and obesity among children.

Dr Enrique García Bengoechea is a researcher affiliated with Participatory Research at McGill, McGill University (Montreal, Canada). Formerly a Research Associate with the Alberta Center for Active Living (Edmonton, Canada), he has held appointments at the level of Associate Professor at McGill University and the University of Western Sydney (Australia). Enrique's research interests include community-based physical activity and health promotion, and youth development and socialization in sport. Enrique is a member of the Kahnawake Schools Diabetes prevention Project (KSDPP) research team. In this capacity, he is currently involved in participatory projects aiming at designing, implementing, and evaluating policy and active transportation interventions to mobilize the school and broader community and increase physical activity opportunities for indigenous children.

Mrs Charlotte Flaherty works as Safe and Sustainable Travel Coordinator for Dunedin City Council. Her role involves working with schools to develop travel plans. Travel plan parent surveys show parents are reluctant to allow their child to ride on the road, citing safety concerns and lack of cycle skills. Charlotte has set up a cycle skills training programme for Dunedin primary and secondary schools, was involved in the Young People and Bus Use section of the recently completed Otago School Students Lifestyle Survey and has been involved in the BEATS Study since inception.

Dr Jillian Frater has recently completed her PhD in the Geography Department at the University of Canterbury. Her research considered the influences on cycling to school among teenagers in Christchurch, New Zealand using the theory of planned behaviour and the prototype willingness model. She previously worked as a town planner for 18 years, both for councils and as a consultant. She has been on many cycle touring trips around the world with her family and hopes to do many more in future. Her PhD enabled her to combine her interests in cycling, children's geographies and sustainability. She is now considering her options for the future.

Dr Susan Sandretto works at the University of Otago where she contributes to education studies and teacher education programmes at the undergraduate and postgraduate levels, teaches qualitative research and supervises at the postgraduate level. Her research interests include critical multiliteracies, critical literacy, gender issues in education, educational policy, second language acquisition and practitioner research. She is a member of the University of Otago Human Ethics Committee (Non-Health). Her book, *Planting seeds: Embedding critical literacy into your classroom programme* (NZCER Press, 2011) was the result of three years of research with primary and secondary teachers. Susan is a former primary school teacher.

Dr Judith Rodda is a recent PhD graduate in spatial ecology. Judy completed a Bachelor of Science degree in Physics and Master's of Science in Oceanography in the United States. She was awarded the Environmental Systems Research Institute (ESRI) Young Scholar Award for 2016. Judy is currently working as a research assistant responsible for the Geographic Information Systems analysis for the BEATS Study.

Dr Daniela Aldabe completed a Bachelor in Physiotherapy, Masters in Human Movement Science in Brazil and recently graduated from the University of Otago with a PhD in Clinical Biomechanics. She has experience with musculoskeletal disorders and rehabilitation for over 10 years. In Brazil, she worked as a lecturer in Physiotherapy and Physical Education and supervised undergraduate students. She is currently working as a research coordinator for the BEATS Study.

Kek Chiew Ching is currently a postgraduate student undertaking her Masters in Physical Education at the School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin. She graduated with a Bachelor in Arts (Diploma in Education – Physical Education) in Singapore, National Institute of Singapore, Nanyang Technological University of Singapore in 2001 and has been a teacher specializing in Physical Education in 2 primary schools in Singapore from 2001 to 2015. Her area of research is on active transport to school, physical activity levels and weight status in adolescents.

Garrick Hately is a Masters student at the School of Physical Education, Sports and Exercise Sciences at the University of Otago. Prior to beginning his Masters, Garrick completed a Bachelor degree in Human Physiology at the University of Otago in 2015. Garrick's research interests include physical activity, public health promotion, cardiac rehabilitation and quality of life.

Alex Mintoft-Jones is a 4th year Pharmacy student who completed the summer research programme at the Active Living Laboratory in 2015/2016 and has worked as a research assistant on the BEATS Study in 2016.

Tessa Pocock is a 4th year Bachelor of Physical Education Honours student who completed the summer research programme at the Active Living Laboratory in 2015/2016.

Leiana Sloane graduated with the Bachelor of Physical Education with Honours in 2016. Leiana completed her Honours project as a part of the BEATS Study and worked as a research assistant in 2015.

Contact Details

For all queries about the BEATS Study and how to get involved, please contact the Study Coordinator, Principal Investigator or Active Living Laboratory.

BEATS Study Coordinator: Dr Daniela Aldabe

School of Physical Education, Sport and Exercise Sciences
University of Otago, PO Box 56, Dunedin 9054, NEW ZEALAND
Phone: +64 3 479 9112
E-mail: beats@otago.ac.nz
Website: www.otago.ac.nz/beats

Principal Investigator: Dr Sandy Mandic

School of Physical Education, Sport and Exercise Sciences
University of Otago, PO Box 56, Dunedin 9054, NEW ZEALAND
Phone: +64 3 479 5415
E-mail: sandra.mandic@otago.ac.nz
Website: www.otago.ac.nz/sopeses/staff/academic/sandra_mandic.html

Active Living Laboratory

School of Physical Education, Sport and Exercise Sciences
University of Otago
55 Union St West, Room G112, PO Box 56, Dunedin 9054, NEW ZEALAND
Phone: +64 3 479 9112
E-mail: active.living@otago.ac.nz
Website: www.otago.ac.nz/active-living

HOSTED BY



Active Living Laboratory

otago.ac.nz/active-living

BEATS Study Symposium 2016 Proceedings
Author: BEATS Study Research Team
Publisher: University of Otago, Dunedin, New Zealand
Publication date: July 2017
Available on the Active Living Laboratory website:
www.otago.ac.nz/active-living

ISBN: 978-0-473-36213-3