

Residential proximity to school and the active travel choices of parents



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Introduction

With less than half of Australian adults sufficiently active for health benefits,¹⁻³ public health campaigns on physical activity aim to activate the most sedentary.⁴ In this context, walking is the behaviour that is most relevant.⁵⁻⁸

Walking for the purpose of transport is of particular interest to the health sector.⁹⁻¹¹ Australian population data show that more than 50% of adults report walking for transport at least once in the previous two weeks. Also, when compared with walking for recreation and exercise, fewer social inequalities in patterns of participation exist.¹² Daily school travel is an instance of walking for transport that offers parents an opportunity for regular physical activity. Previous school travel studies have found that most parents accompany children of primary school age to school.^{13,14} Four hundred metres is generally regarded by transport planners as a walkable distance to "necessary activity

centres",¹⁵ and studies of adults' travel behaviour commonly report walking trips to average two kilometres and to be around 15 minutes in duration.^{10,16,17}

An initial step in establishing effective approaches to increasing walking to school among parents is to understand the factors that may influence them to do so. For example, children for whom there are no barriers to walking or cycling to school are six times more likely to walk or cycle than their peers for whom one or more barriers exist.¹⁸ Although no studies have reported factors associated with school-travel choices among parents, commonly cited barriers to children's walking or cycling to school have included long distances,^{13,18,19} dangerous motor vehicle traffic,^{13,18,19} adverse weather conditions,¹⁸ hilly routes,¹⁹ safety,^{13,18} crossing busy intersections,^{19,20} poor access to pedestrian crossings,¹⁹ laziness,²¹ and having too much to carry.²¹ Attending a non-government school^{13,14} and unsupportive

Abstract

Issue addressed: Walking for transport can contribute significantly to health-enhancing physical activity. We examined the prevalence and duration of walking to and from school, together with perceived influences on doing so, among parents of primary school children.

Methods: Questionnaires were completed by parents from four primary schools (one government and three private) located in south-east Queensland (n=559; 40% response rate).

Results: Eighteen per cent of parents reported walking for at least 10 minutes during journeys to school. Significantly greater proportions of parents with only one car in their household, with a child who attended a government school, with no driver's licence, who had less than 11 years of education, and lived within two kilometres of the school walked for at least 10 minutes during the school journey. Factors perceived by parents most strongly to influence walking to school were: being physically active; safety concerns for the child walking alone; not having to park; walking being the child's preferred option; too much motor vehicle traffic; and their child's age and level of road sense.

Conclusions: Despite the overall low prevalence of walking to school by parents, health-enhancing benefits may be achieved even when other modes of transport are used in conjunction with walking.

Key words: Physical activity, walking, school, parent, barriers, enablers, correlates.

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So what?

Policies and campaigns on walking to school could target parents and children simultaneously. School proximity to residential areas and school catchment policies can help to promote a supportive environment for walking to school. Reduced traffic speed and volume and other physical and social innovations in schools and local communities that address influences will also be important.

school policies¹⁸ have also been reported to hinder active school travel. High residential density,²² small schools,²² being male,²³ older,²¹ from a non-English speaking background,¹⁴ from families in lower occupational categories,¹⁴ from a household that does not own a car,^{13,14,24} and having parents with no paid work¹³ have also been noted as contributors of children's active travel to school.

A recent review of adults' travel behaviour found walking for transport to be associated with perceptions of traffic and busy roads, the presence of pathways, highly walkable neighbourhoods, aesthetically pleasing environments, accessibility, safety, and weather.²⁵ Not possessing a driver's licence²⁶ and travel time⁹ are also associated with increased

likelihood of active commuting among adults.

While there have been several studies of children's school travel behaviour, ours is the first to focus specifically on school-related travel behaviour among parents. We examine the prevalence and socio-demographic variations in walking to and from school among parents of primary school children. The study also investigates factors that parents perceive to influence their decision to walk their children to and from school.

Methods

Setting of the study

The study is set in a rapidly developing, geographically defined

Table 1: Socio-demographic characteristics of participants.

Characteristic	Government school		Non-government school		Total	
	n	%	n	%	n	%
Child's year level						
Pre-school – 3	93	40	137	43	230	42
4–7	137	60	180	57	317	58
Child's sex						
Male	106	46	150	47	256	47
Female	124	54	169	53	293	53
Number primary school children						
1	121	53	190	60	311	57
≥2	108	47	128	40	236	43
Parent age group (years)						
18–29	22	10	17	5	39	7
30–44	185	81	241	76	426	78
≥45	22	10	58	18	80	15
Parent sex						
Male	28	12	33	10	61	11
Female	201	88	285	90	486	89
Parent education level						
10 years or less	72	32	41	13	113	21
12 years or TAFE	83	37	95	30	178	33
University or degree	72	32	182	57	254	47
Parent paid work						
Yes	133	63	204	69	337	66
No	79	37	94	32	173	34
Parent marital status						
Single	34	15	33	10	67	12
Married or de facto	192	85	284	90	476	88
Parent country of birth						
Australia	175	76	255	80	430	79
Non-Australian	55	24	63	20	118	22
Number of cars per household						
1	65	29	49	16	114	21
2	163	72	268	85	431	79
Parent valid driver's licence						
Yes	224	97	314	98	538	98
No	6	3	4	1	10	2
Distance to school						
<400 m	16	7	12	4	28	5
400 m to 2 km	88	38	42	13	130	24
2–5 km	39	17	63	20	102	19
>5 km	88	38	200	63	288	53
Whole sample	236	42	323	58	559	100

region of south-east Queensland. Four schools (one government and three non-government) located within two kilometres of each other took part. The area largely consists of low-density residential housing (separate houses) and a higher-than-average proportion of young families. This quantitative case study provides the opportunity to explore the relevant issues within a defined local community context. The data were extracted, with permission, from a broader community needs assessment by the State Government. Parents were informed that they could decline to take part in the survey, and relevant government department and school protocols were observed. In this context, formal ethical approval was not sought.

Procedures

Data were collected concurrently in the four schools over a two-week period during term two (autumn), 2004. Questionnaires were distributed to parents with regular school correspondence (e.g. newsletters). Completed surveys were returned to classroom teachers. Random prize draws and classroom prizes were offered as incentives to increase response rates. The survey was directed to the parent or carer who most often arranged school travel. Items were answered in relation to the oldest child. Survey questions were pilot tested with primary school parents who were not part of the targeted study sample.

Sample

All parents (n=1,360) with children attending one of the four schools were invited to participate. The response rate was 39% for the government school and 42% for the three non-government schools; the overall response rate was 40% (n=599).

Measures

Prevalence of walking and driving to and from school.

Two questions on mode of transport to school were used. The first asked about habitual modes of school travel (e.g. "On a

normal school day, what is the main form of transport your eldest primary school child uses to get to and from school?"). The second addressed the frequency over the previous school week (e.g. "In the last five school days, on how many days did your eldest primary school child walk or ride a bike either to or from school?"). Parents were also asked to identify the school journey distance from response categories provided (less than 400 metres; 400 metres to two kilometres; 2-5 kilometres; more than five kilometres). The usual duration of the journey was assessed using an open-ended question. They were also asked to record their preferred mode of transport for their child to travel to school. Those who usually travelled to school with their child were asked what the final destination of the trip was, whether any other stops were usually made and the purpose of these stops. The same set of questions was asked separately for the trip home from school.

Walking as a component of the journey to school

The duration of parents' walking during the school journey was assessed by asking: "If you usually travel with your eldest primary school child to or from school, how much time do you spend walking during the trip? Please record the total time walking to and from the car, bus stops and other stops, between home and primary school."

Factors that had an impact on walking to school

Three survey items examined factors that influenced school travel behaviour. First, parents were asked to rate the extent to which a list of factors affected whether they and their child walked to school on a four-point Likert scale ('a major impact', 'somewhat of an impact', 'not much of an impact' and 'not an impact at all'). Second, parents were asked to rate the reasons for using their usual mode of transport to school using a four-point Likert scale ('a major reason', 'somewhat of a reason', 'not much of a reason' and 'not a reason at all'). The list of potential reasons was adopted from earlier research.^{13,14,18,21,23,24} Third, they were

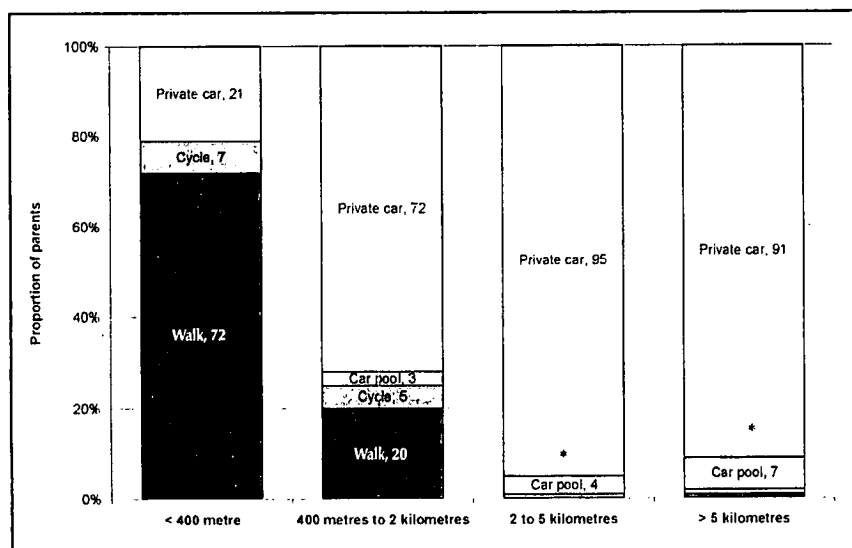


Figure 1: Main form of transport to school, by journey distance.

* for journeys greater than two kilometres, walking (1%), cycling (1%) and public transport (1%) were represented by small proportions of respondents.

asked to what extent a list of statements described the physical environment surroundings their child's primary school, modified from an earlier research study.²⁷ A four-point Likert scale was used ('strongly agree', 'somewhat agree', 'somewhat disagree', 'strongly disagree' and 'don't know').

Socio-demographic attributes of respondents

Parents were asked to report relevant socio-demographic characteristics (listed in Table 1).

Data analyses

Descriptive statistics (percentages, means and standard deviations) were used to summarise the characteristics of the sample and responses on walking versus driving less than two kilometres to school; duration of walking trips; parental accompaniment and distance to school; journey itinerary/stops; and perceived influential factors of walking to school. Two kilometres or less was considered a viable distance to walk to school. Chi-squared tests were used to examine the associations between categorical variables. T-tests examined the statistical significance of the difference between the mean scores of parents who walked and those who drove less than two kilometres to school, on items relating to influential factors (measured as continuous variables using four-point Likert scales). Statistical significance for all analyses was determined at the level of

$p < 0.05$. All statistical analyses were conducted using SPSS version 10.0.²⁸

Results

Socio-demographic attributes of respondents

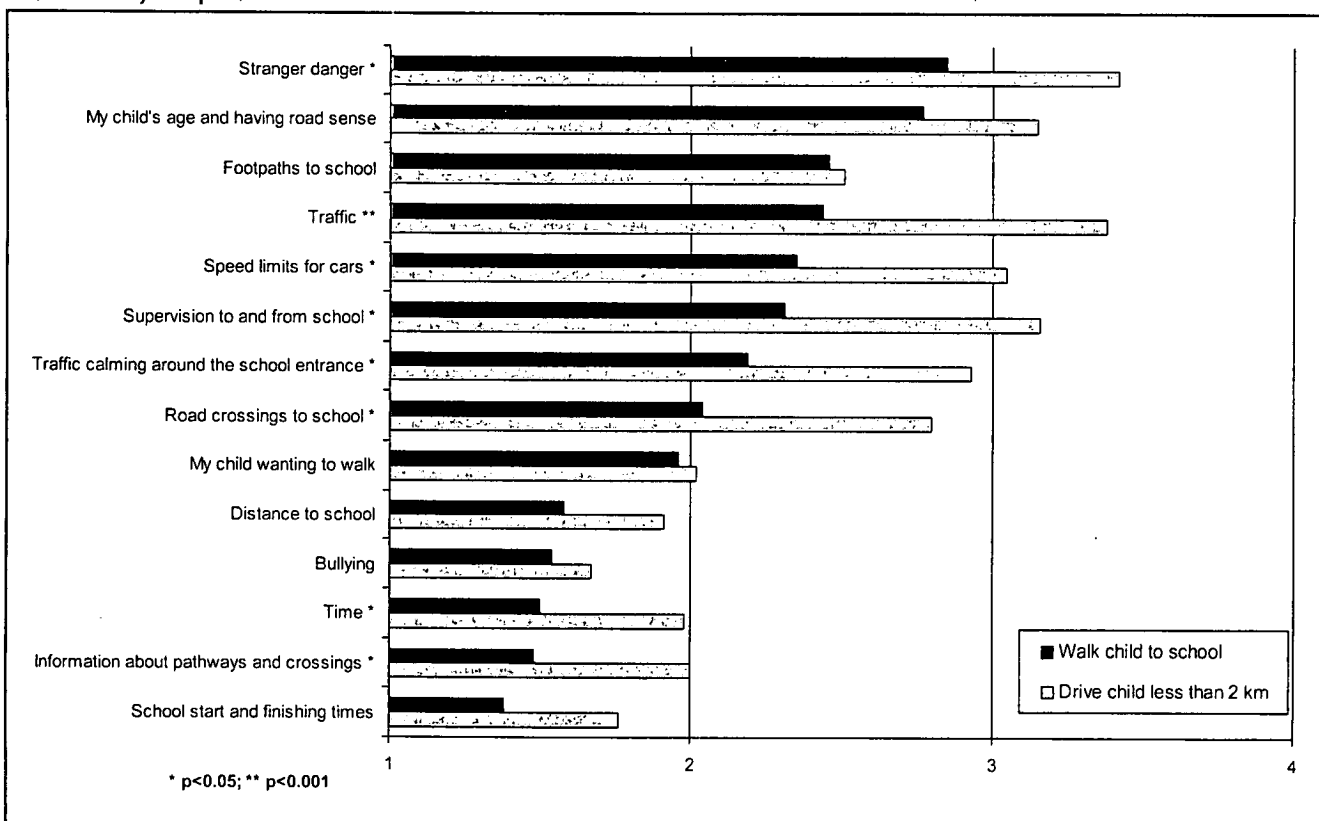
Respondents' demographic attributes are shown in Table 1. The mean grade level of children was Grade 5 (SD 2.1). The average number of children from each family attending primary school was 1.6 (SD 0.7).

Parents of children attending the government school were more likely to be younger (≤ 45 years; $\chi^2 = 10.584, p = 0.005$), to reside in a household with only one car ($\chi^2 = 13.656, p < 0.001$), and to have lower levels of education (lower than university qualification; $\chi^2 = 42.954, p < 0.001$) than those parents whose child attended a non-government school. Government school parents were also more likely to live closer to the school, specifically between 400 metres and two kilometres ($\chi^2 = 53.882, p < 0.001$).

Prevalence of walking and driving to and from school

Overall, for all school travel modes, 65% of parents reported usually accompanying their oldest child to school and 62% from school. Having one as opposed to more than one child at primary school (69% vs. 60%, respectively; $\chi^2 = 4.371, p = 0.023$), and

Figure 2: Factors reported to have an impact on walking to school, by usual main form of transport; mean rating (1 = not an impact at all; 4 = a major impact).



having a child in younger (pre-school to year three) rather than older year levels (74% vs. 59%, respectively; $\chi^2=11.689$, $p<0.001$) were significantly associated with accompanying a child to school.

Driving a private vehicle to school was the main form of transport for 85% of parents and from school for 80% of parents. Overall, 8% reported walking to school and 10% from school. Parents who walked did so on average 3.8 days per week.

Walking was the most commonly reported main form of transport to school for journeys less than a distance of 400 metres (see Figure 1). For this distance, walking to school took a similar time (mean 7 minutes; SD 2.9) that it took to drive to school (mean 8 minutes; SD 7.1). Twenty per cent of parents with school journeys between 400 metres and two kilometres reported walking to school. Walking this distance took twice as long (mean 12 minutes; SD 5.7) as it took to drive (mean 6 minutes; SD 4.9).

Well over half (67%) of the children who walked to school were accompanied by a parent, whereas only half (50%) of the children who walked home from school were accompanied by a parent. The proportion of parents who reported accompanying a child was greater for walking journeys between 400 metres and two kilometres (76%) than for journeys under 400 metres (56%).

For school trips under two kilometres, a significantly greater proportion of parents who drove went directly on to work after driving their child to school (56%) than did those who walked

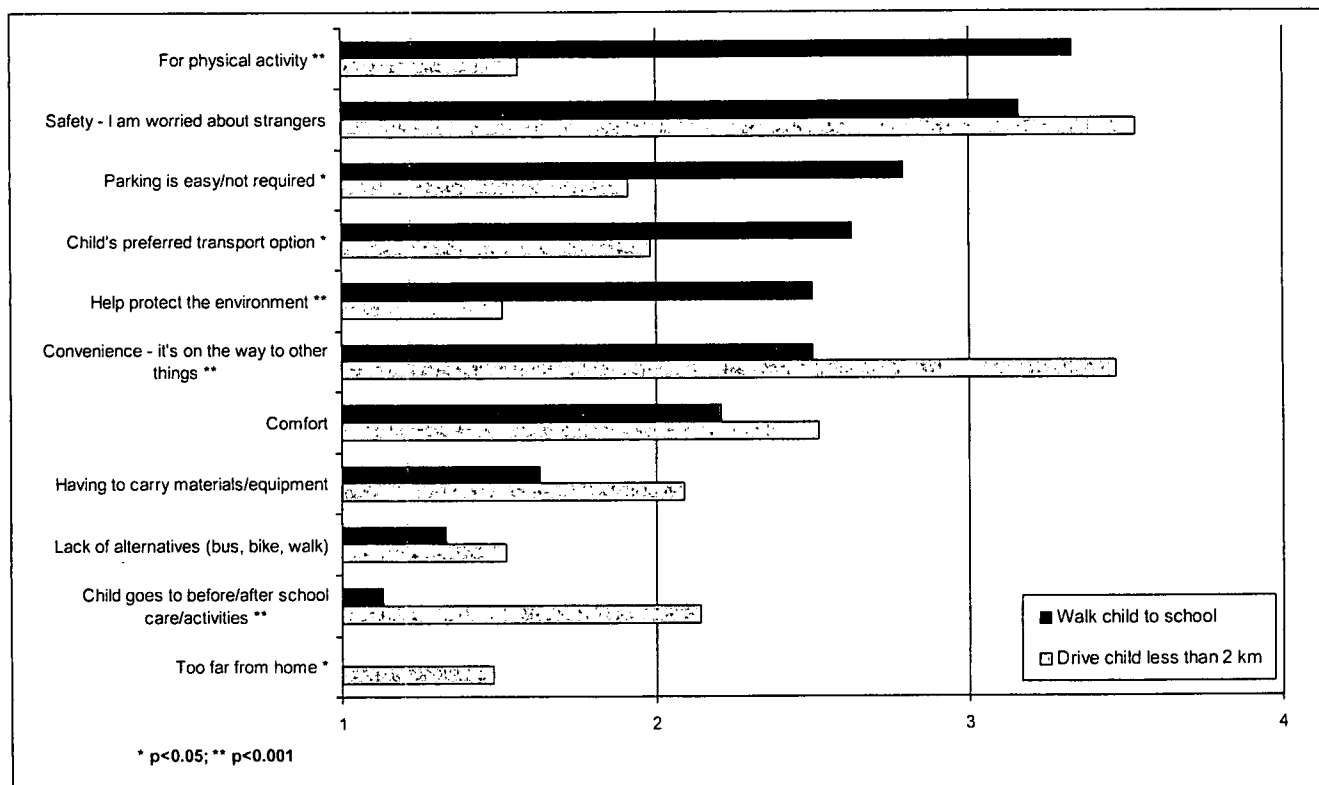
their child to school (19%; $\chi^2=9.410$, $p=0.002$). Comparable findings were identified for the trip home (47% and 8% respectively; $\chi^2=10.485$, $p=0.001$). There were no differences in the number of stops made during school trips under two kilometres (e.g. 31% for walking, 37% for driving). The most common stops were at shops, other schools, or child care facilities.

Walking as a component of the journey to school

Over all school travel modes, 18% of parents reported that the portion of the journey to school that they walked was 10 minutes or longer. An additional 73% of parents reported walking as a portion of the journey to school, but for less than 10 minutes. For parents whose main form of school travel was walking, two-thirds walked for 10 minutes or longer. For parents whose main form of transport to school was driving, 10% also walked for at least 10 minutes as a component of the journey.

Significantly greater proportions of parents reported walking for at least 10 minutes as a component of the journey to school (for all school travel modes) if their child attended a government school (27% vs. 11% for non-government; $p=0.002$), had only one car in their household (30% vs. 14% for two or more cars; $p=0.014$), did not have a driver's licence (60% vs. 14% with a driver's licence; $p=0.046$), had 10 years or less of education (32% vs. 15% for more than 10 years of education; $p=0.030$), and had school journeys less than two kilometres (33% vs. 11% for more than two kilometres; $p<0.001$).

Figure 3: Reported reasons for walking and driving to school; mean rating (1 = not a reason at all; 4 = a major reason).



Walking as the main form of school travel for journeys 10 minutes or longer were associated with child grade level (8% for years four to seven vs. 2% for pre-school to year three; $p=0.010$), and number of children attending the primary school (6% for one child vs. 3% for more than one child; $p=0.022$).

Factors reported as having an impact on parents walking to school

Of those parents who drove less than two kilometres to school, 40% reported that they would prefer their child to walk to school, 23% would prefer their child to cycle and 28% would continue to drive. Parents who walked to school and parents who drove less than two kilometres to school were compared in relation to a list of factors having an impact on whether they and their child walked to school (see Figure 2). Significant differences in responses were found for 'stranger danger', 'traffic', 'speed limits for cars', 'road crossings to school', 'information about pathways and crossings', 'time', 'supervision to and from school' and 'traffic calming around the school entrance'.

Parents who walked to school and parents who drove less than two kilometres to school were also compared based on the reasons for using their usual mode of transport to school (see Figure 3). Significant differences in responses were found for 'convenience – it's on the way to other things', 'for physical activity', 'parking is easy/or not required', 'child's preferred transport option', 'help protect the environment', 'too far from home' and 'child goes to before/after school care/activities'.

Finally, those who walked and those who drove less than two

kilometres were compared in relation to how they perceived the environmental surroundings (see Table 2). Parents who walked to school had significantly fewer traffic concerns and higher ratings on the item 'ease of walking to school' compared with those who drove less than two kilometres.

Discussion

School travel was found to be a daily activity for 60% of parents of primary school children in the geographically defined locality of our study. Encouragingly, walking to school for journeys of less than 400 metres was common among parents who accompanied their child to school (72%). Walking was also common for journeys over 400 metres and up to two kilometres; however, over this distance it was not as prevalent as has been reported in other Australian studies (e.g.^{13,14}). This may be because not all children who walked to school were accompanied by a parent and some of the barriers to walking to school over this longer distance may be more pronounced, especially for parents who accompany younger children to school. Based on the distances involved, we estimated that parents who walked would accrue an average of 14 minutes of walking per journey, or 106 minutes of walking per week, for journeys under 400 metres (estimates include a round trip back home from school). For journeys between 400 metres and two kilometres, we estimated an accrual of 24 minutes of walking per journey, or 182 minutes of walking per week (estimates again include a round trip back home from school).

Walking was also accrued during school journeys of more than

Table 2: Parents' perceptions of environmental attributes in the area surrounding the school.

Survey items	Mean rating (1 = Strongly agree; 4 = Strongly disagree)			
	Walk		Drive	
	Mean	SD	Mean	SD
It is easy to walk to school from my home ^b	1.08	0.27	1.79	1.00
You often see people out walking	1.38	0.64	1.47	0.63
There are bike/walking tracks that are easy to get to	1.50	0.76	1.89	0.99
There are pleasant natural features in the area (parks, rivers)	1.56	0.65	1.61	0.85
The area is attractive (buildings, trees, gardens)	1.62	0.64	1.61	0.73
The neighbourhood is friendly	1.65	0.54	1.89	0.79
There are footpaths on most of the streets	1.92	1.02	1.93	0.88
It is easy to walk to a school bus stop from my home	2.00	1.00	2.09	1.09
There are many alternative walking routes to primary school (I don't have to go the same way each time)	2.08	0.86	2.40	1.16
Busy streets have crossings and traffic signals to help walkers cross	2.19	1.06	2.49	1.23
Street crossings are at appropriate locations	2.38	0.98	2.50	1.11
There is so much traffic along most nearby streets that it makes it difficult or unpleasant to walk ^a	2.96	0.92	2.38	0.95
It is safe for children to walk alone in the area during the day	3.08	0.76	3.18	0.83

(a) $p<0.05$.

(b) $p<0.001$.

two kilometres and when other modes of transport were used; 10% of parents who drove to school walked for at least 10 minutes during each school trip. An additional 73% of parents who drove walked for less than 10 minutes as part of the school trip. For these parents, there may be scope to increase walking to health-enhancing levels. Increasing walking to at least 10 minutes during school journeys has the potential to achieve two-thirds of an individual's daily physical activity requirements, assuming the walking would be of moderate intensity (calculated using a round-trip scenario twice per day).

There are limitations to the self-reported measures used in this study, particularly in relation to recall bias. Transport behaviour was assessed by two questions based on previous research. Although they were tested, their validity and reliability have not been established. Also, our transport questions only considered parents' trips to and from school. It is likely that parents would complete a round trip home or walked elsewhere after dropping their child off at school. As a consequence, we were only able to estimate the duration of walking related to walking to school. Future research also needs to capture the walking intensity of school trips to obtain estimates of potential health benefits associated with promoting walking to and from school. Our survey recruited parents (some 40% of those initially approached) who were willing to participate. These respondents thus may not be representative of the overall attitudes and behaviours of the total school parent population in the region that we sampled. It may also be the case that this region and its residents may not be representative of the broader State or national population and may be different from residents of other regional areas. For example, our study had a higher proportion of parents whose child attended a non-government school, compared with the State average of around 70%.²⁹ However, our focus was not on prevalence, and we make no inferences about the representations of our data. We were more concerned primarily with associations within the data and patterns of differences.

Changing the travel behaviour of parents for journeys under two kilometres and increasing walking as a component of overall trips to and from school may be appropriate targets for health promotion campaigns on physical activity. We found that 40% of parents who drove less than two kilometres to school would prefer to walk, and may thus be receptive to travel behaviour change initiatives. Parents in this study who had children in lower grades and had only one child at school were more likely to walk to school. Previous studies have also found male students,²³ school type,^{13,14} being in a lower occupational category¹⁴ and the household not owning a car^{13,14,24} to be more likely to walk to school.

Our findings identify potential challenges to changing the travel behaviour of these parents in future initiatives. Consistent with previous studies,^{13,18,19} we found perceived vehicle traffic

volume and speed to be among the strongest perceived barriers to walking to school for parents who drove. Interventions may therefore include strategies such as parking and drop-off policies and pedestrian infrastructure separated from traffic; having low traffic speed environments with visible law enforcement; as well as having an official walking to school day or week or offering incentives to parent to walk.

Interventions targeting students may also be of value. Walking being the child's preferred mode of transport to school was commonly reported as an enabler of walking to school by parents. Consistent with previous studies,^{13,18} 'stranger danger', lack of adult supervision for walking to school and children being too young and not having road sense were commonly reported barriers to walking to school. It may be that, if children wanted to walk to school, parents may see this as a more feasible transport option. Interventions involving increased safety, incentive schemes, education and awareness-raising, advocacy programs, walk-to-school days and competitions may be viable investments. Previous studies have also demonstrated the importance of having school policies supportive of active commuting.¹⁸ Establishing walking school-bus programs may also generate social support for walking to school among parents who may not normally walk.

Only 28% of parents who drove less than two kilometres to school would prefer not to change their travel behaviour. Possible reasons for this included using the car to go straight to work, participating in before- or after-school care, and taking heavy items to school. We also found that if parking was perceived to be easy this was a reason for parents with journeys less than two kilometres choosing to drive to school. Not having to park was a common motivator for those parents who chose to walk. Parking and drop-off policies that require parents to walk five minutes each way at the end of a school trip may help to increase walking among parents who drive to school. Such policies may also be used to deter parents who travel less than two kilometres from driving. We found that having 10 years or less education, having no or only one car for the household, not having a driver's licence and attending a government school to be associated with walking for at least 10 minutes as a component of the journey to school.

To design appropriate campaigns, research is needed to identify subsets of parents who may be more amenable to change. More broadly, exploring the social benefits for families and schools, such as spending quality time together, socialisation with other parents, and being actively involved in the school, may be of value.

In conclusion, walking to school appeared to be an accessible form of physical activity for the parents. Our findings, from a quantitative case study in a regional area, reinforce the potential importance of urban design and geographic catchment policies

at schools that include building schools close and within walking distance (within 400 metres to two kilometres) to residential areas. Different approaches designed to motivate children and parents to walk to school should be considered. For example, for some parents, the idea that helping to protect the environment is a reason to walk may be a significant motivating factor. Increasing walking may still be feasible when other modes of transport are being used, and may be amenable to a range of travel behaviour change interventions. Approaches to school travel behaviour change among parents need to be holistic and comprehensive and integrated with campaigns targeting children. Such approaches would also have the additional benefits of affording increased opportunities for social interaction between parents and children. Parental role modelling and support may encourage children to walk to school.¹⁹

The descriptive information provided by this study broadens the understanding of the correlates of walking to school by parents. Further qualitative and quantitative data are needed to inform the development of strategies to influence walking to school as a key component of parents' overall health-enhancing physical activity. Data from large, population-representative samples would be particularly informative.

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