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Original Research

Parental views on active commuting and choice of mode of school transport

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Abstract

Background: Over the last three decades, there have been dramatic changes in the independence and mobility of school-age children, compared to prior generations. A few decades ago, a majority of children routinely roamed their neighborhoods and walked or biked to school and other destinations. Today, parents chauffeur their children to nearly all their activities, often under the pressure of multiple family obligations or out of fear for their safety. In order to encourage active commuting among school-age children, it is critical to understand how parents' views and concerns influence commuting practices.
Methods: We examined parents' views on active commuting and their association with children's actual commuting practices. We analyzed parents' survey responses (N=63,078) collected in October 2010 from the Safe Routes to School (SRTS) program in California.
Results: Children whose parents viewed active commuting as fun, healthy, or encouraged by their child's school were around three times more likely to actively commute than those whose parents did not hold these views. Children whose parents were open to allowing their child to actively commute if their safety and convenience concerns were addressed were as much two times more likely to actively commute than those whose parents were not open to this change.
Conclusions: Parental views on active modes of school transport play a key role in children's commuting practices. A more thorough investigation of their perspectives could inform community health and transportation policies action and increase parental support for SRTS efforts, thus help implement successful and sustainable programs.

INTRODUCTION

There has been a growing interest in promoting physical activity among school-age children as researchers worldwide document increasing rates of obesity in youth, concurrent with decreasing active modes of school transport (hereafter referred to as 'active commuting'), such as walking or biking. In the United States, obesity among youth is a major public health problem, with rates among children more than doubling, and among adolescents, tripling over the last three decades [1, 2]. From 1976-1980 to 2007-2008, obesity rates among children ages 6-11 years old increased from 6.5% to 19.6% and among adolescents ages 12-19 years old increased from 5.0% to 18.1% [1].

The relative imbalance between calories incorporated and calories spent is largely seen as causing these unprecedented numbers of obese youth, thus researchers have investigated the association between reduced physical activity and children's commuting practices in societies dominated by motor vehicle transportation [3-5]. Because school attendance is the most regular activity for school-age children, active commuting to school is seen as a critical opportunity to help children build physical activity into their daily routines and meet the recommended minimum of 60 minutes of daily moderate to vigorous exercise [1, 2,

6]. Indeed, evidence suggests that active commuting is associated with higher energy expenditure in children [7-10]. However, the percentage of children adopting active commuting has been declining over the last few decades [11-15].

Multiple barriers to active commuting have been documented, such as travel time [16]; spatial distances [17, 18]; engineering-related factors like sidewalk presence [19, 20]; and neighborhood design aspects like lack of cross-walk signals [18, 21]. Thus, active commuting has not been popular among school-age children, and their recommended physical activity needs remains largely unmet [8, 22].

In response, a number of organizations – including the U.S. Centers for Disease Control and Prevention, the Robert Wood Johnson Foundation, the National Highway Traffic Safety Administration, and the Pedestrian and Bicycle Information Center – provide promotional materials to implement active commuting strategies in community settings [3, 23]. Additionally, an international movement, called Safe Routes to School (SRTS), has emerged which provides funding for a range of projects whose goal is to remove barriers to, and encourage, active commuting [19, 20, 24-28].

In the United States, SRTS programs draw their federal funding from Section 1404 of the Safe, Accountable, Flexible, and Efficient, Transportation Equity Act: A Legacy for Users, and California is a leading state implementing SRTS efforts. In 1999, the California Department of Transportation (Caltrans) made a $189 million investment for improving community infrastructure and for promoting active commuting by awarding funding to agencies, non-profit organizations, schools, and school districts to implement SRTS projects.

Parents play a critical role in children's commuting practices; therefore the promotion of active commuting must take into account the concerns parents have regarding the safety or convenience of not driving their child to school [16, 29-31]. While we do not have a full understanding of the factors involved in decisions about modes of school transport, such information is necessary if successful and sustainable interventions are to be designed and implemented, and actual commuting practices modified. In this cross-sectional, exploratory study we examine parents' views on active commuting and their association with actual commuting practices. We also discuss the implications of our findings for community health and transportation policies.

METHODS

Funded SRTS programs in California voluntarily submitted evaluation data to the California Department of Public Health. The Institute for Health & Aging at the University of California in San Francisco – a partner in the evaluation of SRTS projects in the state – received de-identified data for analysis.

Two instruments developed by the National Center for Safe Routes to Schools (NCSRTS) to standardize data collection on parents' views on active commuting and children's school transport modes were used to elicit information. The "Parent Survey about Walking and Biking to School" sought to gather information about children's usual mode of travel to and from school and about factors influencing parents' views about active commuting. These included whether parents' viewed active community as encouraged by the school or not, healthy or not, and fun or not. Parents were also asked about their safety and convenience concerns and their willingness to allow their child to actively commute if their specific concerns were addressed.

Parent surveys for the SRTS program were brought home from school by children in grades pre-K through 12th, with only one per household. However, only parents of children in grades K through 8th were specifically encouraged to complete and return the surveys. Teachers were encouraged to give extra-credit to students who returned the completed survey. Alternatively, parents were told that they could fill out the survey as part of their parent-teacher conferences. For schools that communicate with parents through email, an electronic version of the survey was available.

The "Arrival and Departure Tally Sheet" sought to gather information about students' commuting practices, and included questions about weather conditions, safety-related measures along routes to school, and other background school travel data. In the future, this survey will be used to identify changes in students' school commuting practices after implementation of SRTS efforts. To survey students' arrival and departure at baseline, teachers in Kindergarten through 8th grade were asked to poll their students' commuting patterns at least two out of three days of the week (between Tuesday and Thursday). In the mornings, teachers were requested to ask, "How did you arrive at school today?" and at the end of the school day, "How do you plan to leave for home after school?" and record the number of hands raised for each response category – family vehicle, walk, carpool, school bus, bike, transit, or other.

As of October 2010, both surveys had been administered to collect baseline data and 20% (N=42) of grantees from 219 federally funded programs in California voluntarily submitted evaluation data pertaining to 392 schools, including 63,078 unique

parent records. We only report associations between parental views and active commuting *to* school. The findings *from* school are similar and are available upon request.

RESULTS

As we documented in more detail elsewhere [32], the survey of students' mode of transport identified that regardless of weather conditions, day of week, or time of day, the relative proportion of school transport mode was consistent. A majority (57.08%) of children were driven to school in their family vehicle, followed by those who walked (22.36%), carpooled (9.29%), took the school bus (6.49%), biked (3.26%), or used public transportation (0.51%).

In terms of general demographic data, a majority (70%) of children whose parents returned surveys were in elementary school (K through 5th at 10% per grade). The remainder were from parents of children in grades 6th through 12th, and participation dwindled significantly from middle to high school (9.85% of 6th grade parents, 7.59% of 7th grade parents, 6.66% of 8th grade parents, and <1% of 9th through 12th grade parents). Most parents (86.7%) reported having one or two children in grades K through 8th, followed by some with three children (10.28%), few with four children (1.76%), and very few with five or more (<1%). Finally, the majority (59.22%) of parents reported that the distance their child lives from school was 1 mile or less, a portion lived 1-2 miles away (17.43%) as well as over 2 miles away (18.14%), and the remainder did not know (5.22%). The majority of parents reported that the time it took their child to commute to school was 10 minutes or less (75.79%), followed by 11-20 minutes (18.31%), over 20 minutes (4.64%), and the remainder did not know (1.25%). These travel times were not reported in relationship with type of commuting.

In terms of parents' views on active commuting, a majority (51%) felt that their child's school neither encouraged nor discouraged it, yet still felt that it was very fun/fun (55.79%) and very healthy/healthy (86.93%) for their child. Safety concerns in decreasing order included: safety of intersections and crossing (43%), speed of traffic along route (36%), amount of traffic along route (35 %), violence or crime (34%), sidewalks or pathways (20%), crossing guards (17%), and adults to bike/walk with (16%). Convenience concerns in decreasing order included: distance (41%), weather or climate (28%), time (23%), child's before/after-school activities (14%), and convenience of driving (11%). When asked whether they would allow their child to actively commute if these concerns were addressed, between two to four times as many parents agreed than disagreed that they would (Table 1).

Table 1. Parental views of safety and convenience concerns toward active commuting

Safety concerns that affect parents' decision to allow or not allow your child to actively commute to/from school*	%	Freq	Would let child actively commute to/from school if safety concerns were changed or improved (%)*	Yes	No	Not sure	No reply
Safety of Intersections and Crossings	43	27202	Adults to Bike/Walk With	54.97	10.24	8.85	25.94
Speed of Traffic Along Route	36	22646	Crossing Guards	50.52	10.62	8.09	30.77
Amount of Traffic Along Route	35	21852	Safety of Intersections and Crossings	46.18	14.65	12.1	27.07
Violence or Crime	34	21661	Speed of Traffic Along Route	44.38	19.01	15.28	21.23
Sidewalks or Pathways	20	12615	Amount of Traffic Along Route	43.59	18.52	14.77	23.12
Crossing Guards	17	10645	Sidewalks or Pathways	42.79	12.31	8.78	36.12
Adults to Bike/Walk With	16	10187	Violence or Crime	36.57	23.08	15.84	24.51

Convenience concerns that affect parents' decision to allow or not allow your child to actively commute to/from school*	%	Freq	Would let child actively commute to/from school if convenience concerns were changed or improved (%)*	Yes	No	Not sure	No reply
Distance	41	25678	Distance	41.96	18.29	12.57	27.18
Weather or climate	28	17363	Time	41.28	17.06	12.06	29.6
Time	23	14471	Child's before/after-school activities	37.68	21.52	14.33	26.46
Child's before/after-school activities	14	9126	Weather or climate	33.76	19.52	13.24	33.48
Convenience of driving	11	6919	Convenience of driving	33.62	23.92	16.94	25.52

NOTE: (*) Multiple responses are allowed; therefore, percentage does not add up to 100%

Interestingly, while the two highest ranked safety concerns included 'safety of intersections and crossings' and 'speed of traffic along route', and the two lowest ranking ones were having 'adults to walk/bike with' and having 'crossing guards', when parents were asked if they would allow their child to actively commute if safety concerns were addressed, the trends were reversed – the two lowest ranked safety concerns, having 'adults to walk/bike with' and 'crossing guards', appeared as the two top ranked answers, while 'safety of intersections' and 'speed of traffic along route' ranked 3rd and 4th, respectively (Table 1).

Importantly, our data indicated that these views were significantly associated with children's actual commuting practices. We found that children whose parents viewed walking or biking as fun, healthy, or encouraged by the school were about three times more likely (95% CI, p<0.0001) to actively commute than those whose parents viewed it as boring, unhealthy, or not encouraged by the school (Table 2). Similarly, children whose parents reported that they would allow their child to actively commute if their concerns were addressed were between 1.60 and close to 2.5 times more likely (95% CI, p< 0.0001) to actively commute than those whose parents were not open to this change (Table 3).

Table 2. Likelihood of actively commuting against parental views on active commuting

Parental views on active commuting		Actively commuting Yes % (n)	Actively commuting No % (n)	Odds ratio (95% CL)	Chi-square p-value
Fun/ Boring	Fun	**34.23** *(10,504)*	**65.77** *(20,185)*	2.93 *(2.65 - 3.25)*	<.0001
	Boring	**15.06** *(461)*	**84.94** *(2,600)*		
Healthy/ Unhealthy	Healthy	**28.48** *(13,923)*	**71.52** *(34,971)*	3.13 *(2.45 - 4.02)*	<.0001
	Unhealthy	**11.27** *(71)*	**88.73** *(559)*		
Child's School Encourages/ Discourages	Encourages	**35.03** *(8,919)*	**64.97** *(16,544)*	3.17 *(2.81 - 3.57)*	<.0001
	Discourages	**14.53** *(327)*	**85.47** *(1,923)*		

Table 3. Likelihood of actively commuting against parental openness to change regarding safety and convenience concerns

Parental concerns / Safety Concerns		Actively commuting Yes % (n)	Actively commuting No % (n)	Odds ratio (95% CL)	Chi-square p-value
Crossing Guards	*Yes*	**21.53** *(1,111)*	**78.47** *(4,050)*	2.46 *(2.00 - 3.04)*	<.0001
	No	**10.02** *(109)*	**89.98** *(979)*		
Sidewalks or pathways	*Yes*	**15.69** *(819)*	**84.31** *(4,401)*	2.29 *(1.86 - 2.81)*	<.0001
	No	**7.52** *(113)*	**92.48** *(1,389)*		
Adults to walk or bike with	*Yes*	**15.27** *(828)*	**84.73** *(4,593)*	1.67 *(1.34 - 2.09)*	<.0001
	No	**9.72** *(98)*	**90.28** *(910)*		
Violence or crime	*Yes*	**15.49** *(1,183)*	**84.51** *(6,453)*	1.74 *(1.55 - 1.95)*	<.0001
	No	**9.54** *(461)*	**90.46** *(4,372)*		
Safety of intersections and crossings	*Yes*	**15.22** *(1,852)*	**84.78** *(10,319)*	2.02 *(1.78 - 2.29)*	<.0001
	No	**8.15** *(315)*	**91.85** *(3,550)*		
Speed of traffic along route	*Yes*	**14.11** *(1,373)*	**85.89** *(8,355)*	2.02 *(1.78 - 2.30)*	<.0001
	No	**7.53** *(315)*	**92.47** *(3,870)*		
Amount of traffic along route	*Yes*	**13.30** *(1,226)*	**86.70** *(7,995)*	1.93 *(1.69 - 2.21)*	<.0001
	No	**7.35** *(289)*	**92.65** *(3,645)*		
Convenience Concerns					
Weather or climate	*Yes*	**15.50** *(873)*	**84.50** *(4,760)*	2.01 *(1.74 - 2.32)*	<.0001
	No	**8.35** *(273)*	**91.65** *(2,995)*		
Child's before or after school activities	*Yes*	**12.31** *(411)*	**87.69** *(2,928)*	2.29 *(1.85 - 2.86)*	<.0001
	No	**5.76** *(110)*	**94.24** *(1,801)*		
Distance	*Yes*	**11.26** *(1,180)*	**88.74** *(9,299)*	2.09 *(1.82 - 2.41)*	<.0001
	No	**5.71** *(261)*	**94.29** *(4,312)*		
Time	*Yes*	**11.11** *(645)*	**88.89** *(5,162)*	2.38 *(1.94 - 2.90)*	<.0001
	No	**5.00** *(120)*	**95.00** *(2,281)*		
Convenience driving	*Yes*	**9.74** *(219)*	**90.26** *(2,029)*	1.67 *(1.30 - 2.14)*	<.0001
	No	**6.08** *(98)*	**93.92** *(1,515)*		

Finally, while parental consent for active commuting increased with each grade and peaked at 6th grade, notably, a significant proportion of parents reported feeling uncomfortable with it at any grade (42.21%). Further, in the majority of cases (52.82%), parents reported that their children did not ask them for permission to actively commute.

LIMITATIONS

Our study has several limitations. First, our data did not differentiate among community types (e.g. rural vs. urban). Thus, we have no information on what other factors in addition to parental concerns (e.g. urban design, public transit systems, vehicular accidents/fatalities rates) [4, 19, 20, 33, 34] may influence mode of school transport choices. Further, there is some evidence that socioeconomic status is associated with mode of school transport, with lower-income children tending to adopt active commuting more than higher income children [35], yet our study did not include socioeconomic variables.

Second, the feedback we received from parents may not be fully representative of the universe of parents' views, both because parents of younger students (56% were in K through 3rd grade) were disproportionately represented and because, as mentioned earlier, participation in the parent survey was voluntary. Also, because of the voluntary and self-reported nature of our data, the participants in this study may not be representative of the California population at large. To partially address this limitation, our analysis included all the surveys we received rather than a sample.

Third, the self-reported nature of the survey may have led to other types of bias. One is recall bias [36], i.e., inaccuracies due to the fact that survey respondents misremember the issues they are asked to report on. The other is social desirability bias, i.e., parents' providing the answers they thought the researchers desired – which may have affected their replies [37] and constitutes a limitation of studies where there is reason to believe that participants may wish to please researchers. We have reason to believe that both types of bias may have occurred because an analysis conducted by the National Center for Safe Routes to Schools (NCSRTS) found variations between parent and child reported mode of school transport taken on a particular day [13]. Specifically, the NCSRTS found higher estimates of walking and biking to school and lower estimates of driving to school for the parent-reported information compared to the child-reported information. This finding is compatible with recall bias (both parent and child cannot be right, so at least one must misremember) and with social desirability bias (it is likely that parents', but not children, are aware that active commuting is seen as good for the child's health, so parents may tend to over report, so as to be seen as 'good' parents).

Fourth, there may be problems of reliability. While a study that assessed the reliability of the standardized parent survey administered by the NCSRTS found the questions on travel mode, travel time, education, and income to have substantial reliability, the study also found variations in response patterns, and deemed the test-retest reliability to be "unacceptably low" for subjective attitudinal questions, such as the grade level at which parents would allow children to actively commute and barriers to walking and biking [38]. This limitation is shared by our study, since we used the same standardized parent survey provided by the NCSRTS.

DISCUSSION

Despite limitations in our data set and in the cross-sectional design of this study which does not allow us to draw any causal links between the identified associations, our findings replicate other studies that found that most parents are concerned with issues of safety or convenience when it comes to their children walking or biking to school [16, 29, 39]. Our findings, however, go further by showing a strong association between parental views on active commuting and actual children's commuting practices.

Our findings also suggest questions worth additional exploration because they could inform community health and transportation policy actions and increase parental support for SRTS efforts. The observed phenomenon that parents ranked some of their safety concerns in reverse depending on the question asked (Table 1) is an example of a finding that could be explored further. A possible explanation for this reversal may be that parents perceived their top-ranked concerns – 'speed or traffic along route' and 'safety at intersections and crossings' – to be out of their immediate control because they are related to driver behaviors and street design. Thus, their expectations that these concerns would be addressed may be low. While these concerns may still influence children's commuting patterns, they clearly require structural changes, such as engineering changes incorporating traffic calming strategies on neighborhood roads or construction changes necessary to build sidewalks and pathways. By contrast, the availability of adults to actively commute with their child or the presence of crossing guards may be seen as more amenable to immediate change, which could explain why parents ranked them highly as improvements they would like to see addressed.

Also, a majority of parents reported that their child did not request their permission to actively commute to school. This raises the question of the role children play in influencing decision making power within families concerning mode of school transport choices, and how this influence may change with the child's age.

Last, the literature shows that lower, rather than higher, socioeconomic status generally appears to be associated with a health behavior and practice, i.e., active

commuting, presumed advantageous to health [40, 41]. However, our data did not include any socioeconomic variables that could help understand this relationship better. Thus, it may be important for future studies to examine how socioeconomic status influences families' commuting choices and subsequently child health outcomes.

Whichever the case may be, our findings suggest that to encourage active commuting among school-age children, it is critical to understand how parents' views and concerns influence commuting practices and which strategies could help them develop positive views regarding active commuting. Understanding parents' views could include the qualitative exploration of family routines between home, school and work; of parents' views about active commuting as a strategy for improving their child's health; or of parents' views about matters of safety or convenience generally as they influence their decision-making and/or risk perception about commuting practices [30, 31].

Moreover, active commuting endeavors could be worth implementing to address not only health but also other family needs. For example, in a Walking School Bus (WSB) program – where children are accompanied by one or more adults while walking to and from school – the recruitment of parents to participate as chaperones was a recognized challenge. However, the parents who were able to participate positively valued the WSB as an opportunity to engage with their child in discussions about school and family issues [42].

Parents play a critical role in children's commuting practices. Therefore, a more thorough investigation of their perspectives would allow a better understanding of what policy courses could increase parental support for SRTS efforts and help implement successful and sustainable programs.

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