

Understanding Parental Support of Child Physical Activity Behavior

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Objective: To examine parental support of child physical activity with an adapted theory of planned behavior model. **Methods:** A representative sample of Canadian mothers (N = 663) who completed measures of family priorities, social cognition, and child physical activity. **Results:** An assessment of family priorities showed that mothers ranked physical activity almost as high as homework and far higher than other activities. **Attitude about providing sup-**

port for child physical activity predicted intention, yet only perceived control over support predicted behavior. Conclusions: Mothers perceive great import of physical activity for their children but they are inhibited by a low perception of control.

Key words: pediatric health, perceived behavioral control, intention, attitude, exercise

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Physical activity is associated with the reduction of several chronic diseases in adults, including breast cancer, colorectal cancer, CVD, stroke, high blood pressure, type 2 diabetes, osteoporosis, and hypertension.¹ In children 5 to 17 years old, physical activity and high physical fitness protect against high blood pressure, high blood cholesterol, metabolic syndrome, low bone density, depression, and obesity.² Unfortunately few children in developed countries are sufficiently active to reap these benefits. For instance, less than 10% of Canadian children and youth accumulate 60 minutes of moderate- to vigorous-intensity physical activity on a daily basis.³ This alarming prevalence of inactivity suggests that promotion efforts must be improved.

School-based physical activity initiatives have shown some efficacy in behavior change,^{4,5} but there is clearly a need to move to additional settings for physical activity interventions among children and youth. One obvious focus for promoting physical activity is within the family unit.⁶ Children spend considerable time within the care of their parents, and indeed parents appear to be

the “gatekeepers” of children and their experiences during family time.^{7,8} At present, physical activity interventions focused on the family are limited and have resulted in negligible changes.⁶ A recent review of these studies demonstrated very low success in producing behavior change⁶ – considerably lower than the success described in the comparable adult literature.⁹

Effective interventions are dependent on a sound theoretical understanding of the potential determinants of a behavior.¹⁰ To this end, a better understanding of parental influence on child physical activity can inform the design of successful family interventions in the future.¹¹ Models of parental influence have received considerable attention in terms of comparing various mechanisms through which parents may influence their children. These generally include role modeling (performing physical activity themselves), persuasion (eg, providing information and pressure to be active), and active support (eg, facilitating physical activity, signing children up for activities, transportation to activities).¹² Of these forms of influence, direct empirical comparisons^{11,13,14} and systematic reviews^{7,15,16} show that active support of children is the most reliable parental influence of child physical activity behavior. Indeed, a review on this topic found that parental support was synonymous with physical activity in their children.⁷ Thus, attention to parent support as a means to changing youth physical activity appears a necessity for successful family-based intervention.

Despite the overwhelming evidence for the importance of parental support for child physical ac-

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tivity, few studies have contributed to our understanding of the parental-support construct. Previous research has produced mixed results as to whether attitudes about the benefits/importance of child activity are a predictor of parental support whereas most other predictors, such as enjoyment of physical activity, gender of parent, age of parent, and perceptions of child competence, have been either null or small in effect size.^{11,13,14} Parental support is ostensibly a collection of behaviors that may require intervention in order to produce the eventual goal of changes in child physical activity. An alternate approach to understanding parental support of child physical activity may be to apply a behavioral theory focused on parental support as a behavior onto itself with specific motives and barriers.

The purpose of this paper was to examine parental support within the context of an adapted theory of planned behavior¹⁷ model in an attempt to extend our understanding of the determinants of child physical activity. The theory of planned behavior suggests that the proximal determinant of behavior is one's intention to perform that behavior and intention is predicted by attitude (evaluation of the behavior), subjective norm (perceived social pressure), and perceived behavioral control (ease/difficulty of performing the behavior). Additionally, perceived behavioral control may predict behavior directly to the extent that the behavior in question is not completely under one's volition.¹⁷ The theory of planned behavior has been established as a strong predictive model in the physical activity domain, and it has been repeatedly demonstrated that intention is a large correlate of behavior whereas attitude and perceived behavioral control, but not subjective norm, are subsequent predictors of intention.^{18,19}

Our adaptation of this model focused on intention to provide parental support and its prediction of parental-perceived physical activity of their child. Further, based on prior research,^{11,13,14} our adaptation included attitude about child physical activity as well as attitudes and perceptions of control about parental support behavior as predictors of physical activity. We hypothesized (1) that parents would likely have very positive attitudes about physical activity for their child, but (2) their attitudes and perception of control to provide parental support would be the strongest predictors of child physical activity.

METHODS

Study Design and Participants

A national Canadian cross-sectional online panel survey was conducted via a hired vendor, Angus Reid Public Opinion, in March 2011. The research team was not involved in the selection process of participants. Instead, Angus Reid has a consumer mail panel database of approximately 110,000 people who agree to answer surveys in return for small gifts. For the present study, Angus Reid randomly

selected 663 mothers with children who were between the ages of 5 and 11 years old. Mothers of this age-group were considered a target sample for understanding parental support for physical activity because children/tweens are more likely to require active support from their parents than are adolescents, who can conceivably navigate transportation and leisure-time activities by themselves or with their peers.⁷ Further, mothers often represent the key respondent in family-based physical initiatives^{6,20} so they were chosen to represent the family unit (in comparison to fathers) in this survey. The sample was stratified by province and population density. A secondary data-analysis and dissemination waiver was approved by the human research ethics board of the institution of the first author.

Measures

Physical activity for children was defined as activity of at least 60 minutes of moderate- to-vigorous-intensity physical activity accumulated throughout the day.²¹ It was described that children can be physically active in sports, school activities, playing with friends, or walking to school. Physical activities were considered any movement that increases heart rate and makes a child out of breath some of the time. Examples of activities, such as running, brisk walking, dancing, swimming, in-line skating, skateboarding, soccer, basketball, and football were provided. When parents had more than one child within the 5-11 year range, they were asked to think of their child whose birthday is closest to the date of the study as the referent for the questions.

Value of physical activity. Mothers were asked to rank how they would like their children to spend their family leisure time (nonschool time). Participants were asked to rank 1 (most important priority) to 5 (least important priority) among the options of participating in daily physical activity, completing their homework, participating in music and art activities, socializing with friends, and participating in family time activities.

Attitude about child physical activity. This was measured by using an aggregate of 3 specific behavioral beliefs about the benefits of physical activity in a format similar to that recommended by Ajzen²² for indirect measures of attitude. The items included the stem "Participating in physical activity helps my child..." and the specific content of "to be healthy," "to have more self-confidence," and "to have a chance to be with friends." The items were evaluated on a 5-point Likert-type scale from strongly agree (5) to strongly disagree (1). This measure has had prior validation in past research,²³ and the reliability of the measure was adequate ($\alpha = .68$).

Attitude about child support of physical activity. Two items specifically created for this study measured this attitude because the construct has no precedent in prior research. Our

items were created based on the direct assessment technique for measuring attitude in the theory of planned behavior and included both instrumental (eg, importance) and affective (eg, enjoyment) properties of an attitude as recommended.²² These items were (1) “supporting my child (through driving, participating, or paying for their activities, etc) in physical activity is important to me,” and “I would enjoy the time spent helping my child get active (eg, driving my child to a sport practice, watching my child participate in activities, etc)”. The items were evaluated on a 5-point Likert-type scale from strongly agree (5) to strongly disagree (1) and the reliability of the measure was adequate ($\alpha = .77$).

Perceived behavioral control over child physical activity support. This was measured using an aggregate of 3 specific control beliefs about the potential barriers of providing physical activity support in a format similar to that recommended by Ajzen²² for indirect measures of perceived behavioral control. The barriers have been validated in prior work^{23,24} and reflect the most common themes that parents report in the physical activity domain (ie, lack of time, fatigue/mood, other family conflict).²⁵ The phrase that preceded these items was “if you really wanted to, how confident are you that you can support your child in more physical activity.....” followed by specific items of (1) “no matter how busy your day is?” (2) “on a day when you don’t really feel like doing it?” and (3) “and still spend the time you want with your family?” The items were evaluated on a 5-point Likert-type scale from very confident (5) to not at all confident (1), and the reliability of the measure was adequate ($\alpha = .79$).

Intention to provide support for child physical activity. This intention was measured using 2 items in a format suggested by Ajzen²² and previously validated in the physical activity domain.²⁶ These items were (1) “I intend to help my child be more physically active” and (2) “I have a plan for my child’s physical activity” scored on a 5-point Likert-type scale from strongly agree (5) to strongly disagree (1). The reliability of the measure was adequate ($\alpha = .68$).

Parent-perceived physical activity (of her child). This perception was measured using the item “Over the past 7 days, on how many days was your child physically active for a total of at least 60 minutes per day?” The response format allowed parents to answer from zero to 7 days. The item is similar in scoring format to the Behavioral Risk Factor Surveillance Survey Instrument,²⁷ Health Behaviour of School Aged Children Survey,²⁸ LSI index of the Godin Leisure-Time Exercise Questionnaire,^{29,30} and the International Physical Activity Questionnaire³¹; but it is framed to correspond with contemporary child physical activity guidelines.²¹ The use of a parent proxy measure of child activity was deemed of interest in this study because the model is focused on predicting paren-

Table 1
Demographic, Health, and Physical Activity Profile

Characteristic	N = 663
Province	
% Alberta	10.3
% British Columbia	14.6
% Manitoba	3.9
% New Brunswick	2.3
% Newfoundland/Labrador	2.1
% Nova Scotia	4.5
% Ontario	42.1
% P.E.I.	1.7
% Quebec	15.7
% Saskatchewan	2.9
Demographic Profile	
# Children mean (SD)	2.00 (0.85)
% Completed University	40.7
% > \$75,000 household income	56.7
% Currently employed	58.3
% Single parents	12.6
% Visible minority ethnicity	27.7
Past Physical Activity	
% Meeting Health Canada’s Guidelines	43.6

tal support of child activity rather than total child activity per se.

Analysis

Descriptives and bivariate correlations of all variables were computed. Analyses of the adapted theory of planned behavior model used structural equation modeling with LISREL 8.7³² with maximum likelihood estimation and a covariance matrix. Specifically, in accordance with the theory of planned behavior,¹⁷ the 2 attitude constructs (child physical activity, child support) and perceived control to provide child physical activity support were modeled as antecedents of intention to support child physical activity. Intention and perceived control were modeled with direct effects upon behavior. The correlations among the structural errors of the attitude and perceived control constructs were freed to correlate. In the measurement model, the first item of each variable was fixed to 1.0 in order to create a metric scale, and all specific item error terms were freed for estimation. The single item measure of behavior was fixed to 40% error, which is commensurate with typical reliability estimates for this type of self-report measure.³¹

RESULTS

Participant Characteristics

Table 1 details the available demographic and behavioral information of the mothers in the sam-

Table 2
Parental Rank Ordering of Importance of Child Physical Activity in Comparison to Other Activities (N = 663)

Activity	#1	#2	#3	#4	#5
Physical Activity	25.5%	32.6%	25.3%	12.4%	4.2%
Homework	34.5%	22.9%	16.3%	12.8%	13.4%
Music/Arts	3.9%	9.7%	16.7%	25.6%	44.0%
Socializing	3.9%	8.9%	15.2%	36.8%	35.1%
Family Time	12.4%	26.4%	3.2%	25.9%	32.1%

ple. Congruent with the regional stratification in the sampling, representation across the provinces reflected Canadian demographics with the exception of Quebec, which was underrepresented.³³ Mothers reported an average of 2 children; and education, income, and employment reflected national averages.³⁴ The sample also had strong ethnic representation of visible minorities (total = 27.7%; 16.2% of the sample reported an Aboriginal ethnicity). In terms of physical activity, 43.6% of mothers reported that they were meeting national guidelines,²¹ which is slightly lower than the national average for women 20-44 years old.³⁵ The difference may be due to this sample of mothers with young children in comparison to national samples of women with and without children. Mothers typically report lower physical activity compared to that of women without children.²⁵

Importance of Physical Activity

Mother’s rank order of importance of physical activity in comparison to other leisure-time activities for their children is detailed in Table 2. Fifty-eight percent of respondents ranked physical activity as the first or second most important activity for their children. This rank ordering was similar to homework (57%), but far higher than music/

arts (14%), peer socializing (13%), and family time (39%). Furthermore, only 4% of the sample considered physical activity as their lowest importance in comparison to the other 4 activities.

Model of Parent Physical Activity Support

Descriptives and bivariate correlations of the main constructs in the child physical activity support model can be found in Table 3. All constructs showed significant correlations with parent-perceived physical activity of her child and intention to provide physical activity support. Effect sizes, however, ranged from small (attitude about child physical activity and child physical activity; $r = .14$) to large (attitude about child support and child support intention; $r = .56$). Of note, attitude about child physical activity displayed a high mean value of 4.74 (SD = 0.42) on its 5-point scale in comparison to the other constructs. Comparison of the 2 types of attitudes showed that the child physical activity attitude was significantly higher than the attitude about support ($t, 662 = 8.43, p < .01; d = .36$).

The main analysis featuring the structural equation model resulted in a modest fit of these data [$\chi^2 (38) = 276.84; p < .01; CFI = .97; RMSEA = .09$] using conventional cut-off criteria and considering

Table 3
Correlations Among the Constructs used to Predict the Intention and Behavior (N = 663)

	2	3	4	5	M	SD
1. Attitude (Child Physical Activity)	.49*	.33*	.45*	.14*	4.74	0.42
2. Attitude (Child Support)		.30*	.56*	.21*	4.53	0.73
3. Perceived Control Over Support			.41*	.40*	3.75	0.97
4. Intention to Support Physical Activity				.23*	4.38	0.85
5. Child Physical Activity Frequency					4.49	1.68

* $p < .01$

Table 4
Factor Loadings of the Parental Support Prediction Model for
Child Physical Activity

	Mean	SD	Factor Loading	Error Variance
Attitude (Child PA)				
Health	4.92	0.27	.83	.31
Self-confidence	4.70	0.61	.88*	.23
Socializing	4.59	0.69	.78*	.39
Attitude (Child Support)				
Important	4.60	0.75	.92	.16
Enjoyable	4.45	0.88	.86*	.25
Perceived Control Over Support				
Time	3.56	1.22	.86	.26
Fatigue/Mood	3.51	1.23	.85*	.28
Other Family Priorities	4.18	0.99	.78*	.39
Intention				
Intend	4.51	0.80	.87	.24
Plan	4.24	1.11	.81*	.34
Child Physical Activity				
Frequency per week	4.49	1.68	.77	.40

* All freed factor loadings significant $p < .01$.

Note.

All loadings reported are standardized. No t-values are available for the first loading because it was fixed for model identification purposes.

the complexity of the model.³⁶ Modification indices did not suggest that any changes to the structural model would improve fit. Inspection of these indices showed that the improvement of fit would need to result from a host of small changes to the measurement component of the model. Furthermore, a test of discriminant validity for the 2 types of attitudes, following the suggested approach by Anderson and Gerbing,³⁷ showed that the 2-component conceptualization of child physical activity and child support was superior in fit to a single attitude construct ($\Delta\chi^2(1) = 31.80$; $p < .01$; $\Delta CFI = .01$).

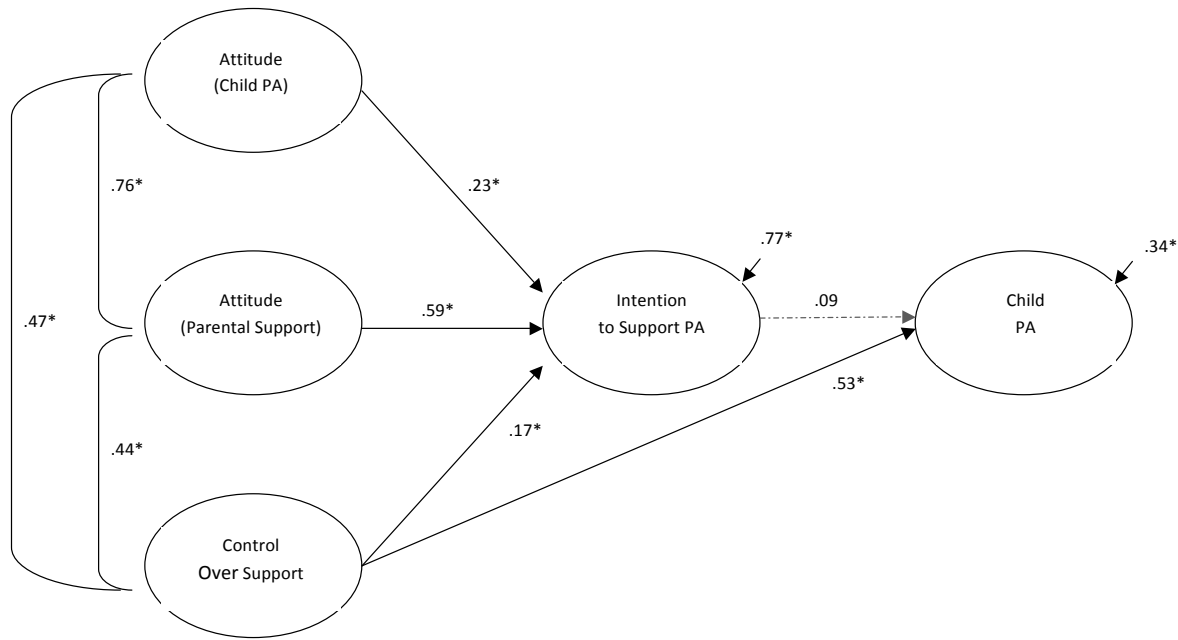
The measurement estimation of the model can be found in Table 4. Overall, the factor loadings were large and significant for the purported constructs, ranging from .81 to .88. The structural model is detailed in Figure 1. Attitude about child physical activity (standardized effect = .23), attitude about support of child activity (standardized effect = .59), and perceived behavioral control of support (standardized effect = .17) all predicted intention significantly and cumulatively explained 77% of its variance. Attitude about support of child physical activity, however, was the dominant predictor with a large effect size whereas the 2 other constructs contributed smaller effects. Still, prediction of par-

ent-perceived child activity was significantly predicted by perceived behavioral control over support (standardized effect = .53), explaining 34% of its variance. Intention did not contribute a significant effect after controlling for perceived behavioral control. Consequently, the indirect effects of both attitude constructs upon parent perceptions of child physical activity were also nonsignificant.

DISCUSSION

The benefits of regular physical activity for children have been well-established, yet activity levels are extremely low.³ Although school-based initiatives have shown some promise in providing an increased dose of physical activity, a focus on interventions within the family is clearly warranted. Most family-based interventions have not shown utility in changing child physical activity⁶; thus a sound understanding of the correlates of child activity in the family home is likely needed to improve our intervention efforts. Parental support has been established as the critical family-level variable linked to child activity,^{7,15,16} yet our understanding of the factors underlying parental support of activity has seen limited research attention. The purpose of this paper was to focus on parental support with a sample of mothers within the context of

Figure 1
Path Model of the adapted Theory of Planned Behavior Model for Predicting Parental Perceptions of Child Physical Activity



Note.
 * = $p < .01$

an adapted theory of planned behavior¹⁷ model in an attempt to deepen our understanding of parental support for child physical activity. The results proved interesting and highlight some potential target variables for family-based physical activity intervention.

First, we hypothesized that parents would likely have very positive attitudes about physical activity for their child. This hypothesis had strong support. Indeed, mothers in our sample ranked regular physical activity as high as homework in an analysis of 5 common priorities in family time. Activities such as arts/music, peer socialization (eg, play dates), and family time ranked much lower than physical activity. The positive attitude was also exemplified in the high mean value of the child physical activity attitude construct measured in this study. Mothers scored extremely high (4.72/5) on the attitude measure with a very small deviation, suggesting that almost all participants espoused the benefits of regular physical activity for their child. This restricted range has very important implications for potential intervention efforts. When variables are ceilinged, it demonstrates little room for change in intervention.³⁸ When the high ranking of this attitude construct and the assess-

ment of priorities are taken together, it shows that mothers are already convinced that regular physical activity is an important and beneficial behavior for their children. Attempts to persuade mothers of these benefits would have very little effect on their attitude and subsequent behavior because there is little room for an increase. Prior unsuccessful behavior-change interventions in the family setting may be partially accounted for through this practice as persuasion/information-based content represents the bulk of these intervention campaigns.⁶ Our study suggests that a focus on the health benefits from child physical activity should not be the focus of family-based interventions.

Our second hypothesis related to the adapted theory of planned behavior model. Specifically, we hypothesized that attitudes and perception of control to provide parental support would be predictors of child physical activity via intention to support. This hypothesis had only partial support, yet the results led to interesting overall findings. The largest predictor of intention to support was clearly attitudes about support. A large effect from this variable and 2 smaller effects from attitude about child physical activity and perceived control over support contributed to explaining 77% of the vari-

ance in intention. This demonstrates that attitude about support plays a critical role in explaining why mothers intend to support their children. This is the first study to attempt to model the underlying social cognitive motives of parental support for child activity. The finding suggests that a mother's evaluation of the enjoyability and utility of her support behaviors is critical to creating the motivation (ie, intention) to support. Thus, interventions aimed at increasing parental support would need to focus parents on the importance of this support and also need to try to make the experience more pleasant for the parents. This is a novel consideration because most interventions target the importance of child physical activity,⁶ rather than the support behavior itself. Experimental intervention on this parental support attitude construct is needed to validate these correlational findings.

Despite the strong variance explained by the intention construct, intention was not a significant predictor of parental perceptions of their child's physical activity, and thus the indirect effects of the attitude constructs were also null. Contrary to our hypotheses, perceived control over support for child physical activity was the single predictor of parent-perceived child physical activity. This has important implications for our understanding of parental support of child physical activity and future intervention initiatives. To our knowledge, this is the first study to employ a control construct (or self-efficacy type construct) of parental support in the understanding of child physical activity. The results show that, regardless of intentions to support or antecedent positive attitudes about child activity and support, the control that mothers have over supporting child activity will predict the behavior. The failure of intention to influence physical activity has seen recent attention,³⁹ and the original rationale for including perceived behavioral control in the theory of planned behavior was based on the premise that some behaviors are not under volitional (ie, intentional) control. It would seem that parental support of child physical activity may be a behavior not explained well by volitional intention.

Our results suggest that family-based child physical activity interventions may need to give considerable attention to raising the perceived control of parents over supporting their children to be active. There is some evidence that increasing the self-regulatory abilities of parents for physical activity time with planning may hold utility.²⁰ Reviews of the general physical activity literature on mediators of interventions position self-regulatory constructs (eg, planning, contingency strategies, stimulus control) as the most consistent agents of change.^{9,40,41} Successful intervention approaches in adult populations have also shown similar results (eg,⁴²⁻⁴⁴). Still, many parents likely face real barriers for physical activity that may exceed an individual focus on self-regulation.²⁵ Social support (eg, parent-shared transport, grandparent

support) at a community collective, environmental support (eg, community programs, availability and access), occupational support (eg, employee consideration for family physical activity time), and policy support (low-cost and available physical activity programs) are all likely needed to improve the control parents perceive over supporting child physical activity.

Despite the original findings of this paper, the results need to be considered within the context of its limitations. First, the study features a cross-sectional design, and thus the findings cannot be considered causal. Future experimental research is needed to justify the proposed direction of the effects within the model. The physical activity measure is also a 7-day retrospective assessment of physical activity being used as a proxy for future behavior using self-report. Prior research has shown almost no difference in the predictive findings (and rank-order associations) between cross-sectional designs and prospective designs up to 6 months duration,⁴⁵⁻⁴⁷ so the limitations of the design may not amount to much difference. Still, future longitudinal assessments seem useful to test the validity of our findings. Second, the assessment of child physical activity was via parent perception, and it is unlikely to reflect the full range of physical activities performed by the child because parents are not present to observe their children many hours per day. The assessment of child activity serves in this model because it is focused on parentally supported activities, which would be in the parent's awareness. Still, future models that employ a more objective indicator (eg, accelerometry) of child physical activity and build a larger prediction model of activity beyond parental support would be helpful over this proxy self-report measure. Finally, the sample used for this research showed generally strong representation of the Canadian population, but it is limited to mothers and more to English-speaking provinces. The findings may not generalize to specific geographical locales, cultures, or fathers. Future research is needed to test the generalizability of these findings.

Human Subjects Statement

This study, employing human participants, was approved by the institution ethical review board of the first author.

Conflict of Interest Statement

The authors report no conflict of interest for this paper.

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