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Promoting Parent and Child Physical Activity Together: Elicitation of Potential Intervention Targets and Preferences

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Abstract

Promoting physical activities that involve both parents and their children would be very useful to the improved health and well-being of families, yet coactivity interventions have been particularly unsuccessful in past research. The purpose of this study was to elicit the salient parental beliefs about coactivity framed through theory of planned behavior in order to inform future intervention content. A representative sample of Canadian parents (N = 483) with children aged 6 to 14 years completed belief elicitation measures of theory of planned behavior, as well as coactivity and program preferences. Analyses included content theming by physical activity belief and preference through tallies of the percentages of parents endorsing each belief. Exploratory analyses of differences in endorsed themes were conducted by parent (mother, father), age of child (6-10 years, 11-14 years), and sex of the child. The results showed that behavioral beliefs about health, interpersonal and educational/learning opportunities and control beliefs about lack of time, various incompatible parent/child factors, parental health, and bad weather were dominant themes. Most of these themes did not vary in endorsement by parent and child characteristics. By contrast, preferences for various activities varied by parent and child characteristics, yet parents overwhelmingly desired the activities to be outdoors, close to home, after work, and originally delivered from community health professionals via Internet or face-to face means. Overall, the findings provide several considerations for specific targets to improve future physical activity intervention approaches among parents and their children.

Keywords

attitude, perceived behavioral control, theory of planned behavior

The importance of fostering physical activity (PA) patterns in youth is difficult to overstate. PA and high physical fitness protect against high blood pressure, high blood cholesterol, metabolic syndrome, low bone density, depression, and obesity (Janssen & LeBlanc, 2010). Unfortunately, few children in developed countries are sufficiently active to reap these benefits. For example, less than 10% of Canadian children and youth accumulate 60 minutes of moderate-to-vigorous-intensity PA on a daily basis (Colley et al., 2011). This high prevalence of inactivity suggests that promotion efforts are paramount for public health.

There is clearly a need to promote PA within the family unit. Children spend considerable time within the care of their parents, and indeed parents appear to be the "gatekeepers" of PA during family time (Gustafson & Rhodes, 2006). Rhodes and Quinlan (2014), for example, identified 15 reviews on this particular topic. Parental influence generally includes two basic factors: parental role modeling (performing PA themselves) and parental support (facilitation of child PA), although parental attitudes about PA and parenting styles and family cohesion have also seen limited research attention with mixed findings (Rhodes & Quinlan, 2014; Trost & Loprinzi, 2011). One of the most advantageous forms of parental influence may be coactivity, whereby parents facilitate activities in which they can be active with their children (Rhodes et al., 2015). This form of support models an active lifestyle (Taylor, Baranowski, & Sallis, 1994), encourages healthy family interpersonal dynamics (Trost & Loprinzi, 2011), and also gets parents active, as they are often plagued by lower PA rates compared with adults without children (Bellows-Riecken & Rhodes, 2008). Unfortunately, interventions on parent–child coactivity have been generally unsuccessful, as stated in several reviews (Kitzman-Ulrich et al.,

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2010; O'Connor, Jago, & Baranowski, 2009; Salmon, Booth, Phongsavan, Murphy, & Timperio, 2007; van Sluijs, Kriemler, & McMinn, 2011). More recent research on coactivity has shown some positive effects of interventions (e.g., Morgan et al., 2011; O'Dwyer, Fairclough, Zoe Knowles, & Stratton, 2012; Rhodes, Naylor, & McKay, 2010), but these are still balanced by several null results (Backlund, Sundelin, & Larsson, 2011; Morrison et al., 2013; Olvera et al., 2008). Furthermore, there is no clear and understandable mechanism or target variable that explains the success or relative failure of these interventions. Thus, while some results are very promising, there is a need to continue to hone the theory behind parent–child coactivity interventions in order to facilitate reliable success.

A better understanding of parental influence and child PA may inform the design and success of family interventions in the future (Loprinzi & Trost, 2010). In line with this approach, Rhodes et al. (2013, 2015) have applied behavioral theory focused on parental support as a behavior onto itself with specific motives and barriers. These researchers applied parental support within the context of a theory of planned behavior (TPB; Ajzen, 1991) model. The TPB 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). Commensurate with the model, intention to provide parental support was predicted by attitudes about support (Rhodes et al., 2013; Rhodes et al., 2015), but the largest predictor of child PA via parent–child coactivity, was perceived control over support.

These findings suggest there may be utility to understanding coactivity support behavior onto itself in order to designate targets for intervention. Rhodes et al. (2015), however, suggested that more in-depth understanding of TPB constructs is needed. Ajzen (2002b) also suggests that the content for TPB-based interventions is founded on the underlying beliefs in the constructs (i.e., behavioral beliefs, control beliefs). Currently, no research has focused on the belief-level markers for parent–child coactivity using any theoretical frame.

Thus, the purpose of this study was to elicit the salient beliefs about coactivity from parents of children younger than 15 years in a representative Canadian sample in order to inform future intervention content. We hypothesized that only a select few beliefs would emerge as important targets of parent–child coactivity that fall into the attitudinal and control domains. Given the developmental differences between children and tweens/teens, we sought to explore whether endorsement of these beliefs differed. Furthermore, the potential gendered perspective of family coactivity (Edwardson & Gorely, 2010) granted an opportunity to explore these beliefs separately by mothers and fathers as well as girls and boys. We also wished to explore the preferences for coactivity and promotion apertures to improve the reach and uptake of future interventions (Estabrooks & Glasgow, 2006) involving parents and their children. We hypothesized that specific preferences for engaging in coactivity, receiving the intervention, and the means of receiving the intervention would result from the elicitation and can be used for future intervention initiatives.

Method

Study Design and Participants

A national Canadian online panel survey was conducted via a hired vendor, Vision Critical, in October 2014. The research team was not involved in the selection process of participants. Instead, Vision Critical has a consumer online panel database of approximately 110,000 people who agree to answer surveys in return for small gifts. For the present study, Vision Critical randomly selected 483 parents with children who were between the ages of 6 and 14 years. Children/tweens are more likely to require active support from their parents than adolescents who can navigate transportation and leisure-time activities by themselves or with their peers supporting the delimiting of age (Gustafson & Rhodes, 2006). The sample was stratified by province and population density. The study was approved by the human research ethics board of the lead author's university and all participants provided informed consent.

Measures

Basic demographics and health questions of the sample were asked along with PA level using a Godin Leisure-Time Questionnaire (Godin & Shephard, 1985) adapted to ask the parent as a proxy for child PA (Rhodes et al., 2013; Rhodes et al., 2015). For the main research questions, measures of coactivity behavioral and control belief elicitation following the procedures recommended by Ajzen (2002a) were employed. Parent–child coactivity was defined as moderate-to-vigorous-intensity PA for children and adolescents for all related questions (Tremblay et al., 2011). When parents had more than one child within the 6- to 14-year range, they were asked to think of their child who is closest to the age of 10 years as the referent for the questions. Spaces (five per question) were left for participants to write in their beliefs, similar to other belief elicitation procedures in the PA domain (Rhodes, Blanchard, Courneya, & Plotnikoff, 2009; Rhodes, Blanchard, & Matheson, 2007). The preference measures were adapted to parent–child coactivity from instruments in the PA domain that have examined intervention delivery feasibility and preferences (Courneya & Hellsten, 1998; Trinh, Plotnikoff, Rhodes, North, & Courneya, 2013). These included assessments about preferred activities, location, time of day, family members present, variety, intensity, supervision, planning style, and intervention contact mode and person.

Analysis Plan

The TPB can be applied to both predict behavior (Ajzen, 1991) and to design interventions through the elicitation of key beliefs thought to underlie its critical constructs (Ajzen, 2002b, 2006; Ajzen & Fishbein, 2005). This study follows TPB methods for that second purpose. Following the suggestions of Ajzen (2002b) for TPB belief elicitation, responses for the beliefs were coded and themed by the study authors. Our next theming approach followed an iterative process. We first constructed a list and definition of the properties of prototypical beliefs from more general TPB research in PA (Symons Downs & Hausenblas, 2005) to use as a frame of reference. Belief statements were then compared with this list and subsequently scored as one of these constructs or added to the list as an additional construct. All themes were abstracted and categorized into themes independently and then compared to reach consensus. In order to ensure some generality of results, we considered Ajzen's (2002b) suggestion to only include the most prevalent beliefs. While somewhat arbitrary, we decided that at least 5% of the sample needed to endorse a belief for it to be included in the results as a final theme. Given our exploratory objectives of examining the endorsed beliefs by child age, sex, and parental gender, we then structured by grouping these data into mothers and fathers, girls and boys, and children (aged 6-10 years) and tween/teens (aged 11-14 years). The age separation is, admittedly, an arbitrary division but it does follow the traditional separation from primary school to middle school in the Canadian setting. Finally, we also explored the proportional deviation across groups using independent sample χ^2 analyses of the proportions. To reduce the potential family-wise error rate, an omnibus test across the eight groups was conducted first. Only significant ($p < .05$) proportional deviations of this omnibus test were explored with follow-up comparisons between different groups. To detect an effect size between small and medium ($w = .25$) using an alpha of .05 and a power of .05, we required at least 30 participants per group.

Results

Participant Characteristics

Table 1 details the available baseline demographic and behavioral information of the parents and children in the sample. The data represent the diversity of Canadian demographics but are not reflective of Quebec (Statistics Canada, 2014). This is likely due to the English requirement when responding to the questionnaire. Responding parents were most likely to be mothers (67.2%) with children of an almost equal sex distribution (48.4% female). Education, income, ethnicity, and employment reflected national averages (Statistics Canada, 2006, 2007). In terms of PA, 21.4% of parents reported their child was meeting national guidelines. When these demographics were examined between fathers and mothers, more mothers responded from the province of Alberta than fathers ($\chi^2_1 = 11.05$; $p < .01$), and mothers reported significantly less employment ($\chi^2_1 = 4.19$; $p < .05$) and household income than fathers ($\chi^2_1 = 10.33$; $p < .01$). Mothers also reported more of their children in the normal weight BMI category than fathers ($\chi^2_1 = 8.09$; $p < .01$), and of their children in the overweight category ($\chi^2_1 = 8.45$; $p < .01$).

Behavioral Beliefs About Parent–Child Activity

The results of the behavioral belief themes are presented in Table 2 and the percentages endorsed by parents is provided in Table 3. Overall, three main themes emerged across all groups: interpersonal, health, and educational/learning opportunity. Both the health benefits (77%) and interpersonal benefits (70%) of coactivity were highly endorsed by the sample, while educational opportunities that parents envisioned for their children as a result of the coactivity experience was endorsed approximately half as much (38%). None of these major themes differed across the eight groups ($p > .05$). For interpersonal beliefs about coactivity, we identified four subtheme beliefs. The most highly (37%) endorsed subtheme was that coactivity would provide a quality family bonding time (e.g., closeness, stronger relationship). A subtheme about family time was also endorsed frequently (32%) and this theme included comments about the quantity of time that could be allocated to family unity. General opportunity to work on family and community communication through coactivity was endorsed by 19% of the sample (e.g., promotes good communication between parent and child, makes the neighbors come out to be sociable). The final interpersonal subtheme included the fun from engaging in coactivity (16% endorsed). It is noteworthy that this subtheme was endorsed 50%+ less than family bonding and time, but included considerations of laughter, enjoyment, and the creation of good memories. None of these themes differed across parent/child sex or child age groupings ($p > .05$).

Five key health-related subthemes were identified in the analyses. Fifty-one percent of parents cited general healthy lifestyle as a key behavioral belief. Likely related to this subtheme, 25% of parents simply described PA, being active, or getting exercise as a behavioral belief. Three subthemes, however, were more specific. For example, 18% of parents specifically cited mental health benefits (less stress, better cognitive abilities) for their child from coactivity. Similarly, 17% of parents cited fitness benefits from coactivity and a much smaller 8% of parents endorsed body shape and weight control benefits for their child from engaging in coactivity. Like the interpersonal behavioral belief subthemes, there were no significant differences across the eight groups ($p > .05$), suggesting a very similar level of endorsement regardless of child age and sex or mothers compared with fathers.

For the educational theme of behavioral beliefs, subthemes of role modeling, teaching opportunities, and sportsmanship

Table 1. Demographic, Health, and Physical Activity Profile.

Characteristics	Total	Fathers (*n* = 159)	Mothers (*n* = 324)
Province			
% Alberta	14.4	6.1	19.9
% British Columbia	16.2	16.5	15.9
% Manitoba	4.3	3.6	4.5
% New Brunswick	2.4	3.6	1.8
% Newfoundland/Labrador	2.2	1.8	2.4
% Nova Scotia	4.3	1.8	5.4
% Ontario	46.6	53.6	42.0
% Prince Edward Island	0.6	1.2	0.3
% Quebec	5.5	7.2	4.5
% Saskatchewan	3.6	3.7	3.6
Demographic profile			
No. of children, *M* (*SD*)	2.19 (1.16)	2.20 (1.02)	2.15 (1.21)
Child age, *M* (*SD*)	10.63 (2.41)	10.34 (2.63)	10.36 (2.35)
Parent age, *M* (*SD*)	43.35 (6.77)	45.77 (7.32)	42.19 (6.17)
Ethnicity			
% Caucasian	87.4	89.0	86.6
% Asian	7.5	5.8	8.4
% Black	2.3	3.2	1.9
% Others	2.7	2.0	3.1
Education			
% Completed high school	99.0	98.8	99.4
% Completed university	53.9	56.1	42.9
% Married/common law	90.1	90.9	86.3
Income			
% >$100,000 Household	37.5	53.0	29.8
% Currently employed	78.0	91.5	68.4
BMI			
% Underweight	2.3	1.3	2.8
% Normal weight	35.6	23.1	42.0
% Overweight	36.7	50.0	30.0
% Obese	25.4	25.6	25.2
Child health profile			
% Allergies	16.3	23.2	24.1
% Physical disabilities	0.7	1.2	0.9
% Learning disabilities	5.6	4.3	9.8
% Asthma	3.1	3.1	3.1
Overall health (1-5), *M* (*SD*)	4.13 (0.82)	4.04 (0.85)	4.19 (0.80)
Past physical activity			
% Children meeting Canada's guidelines	21.4	22.2	20.8
MVPA bouts 60+ minutes, *M* (*SD*)	4.05 (2.11)	4.13 (2.14)	4.00 (2.09)

Note. BMI = body mass index; MVPA = moderate-to-vigorous physical activity.

had noteworthy endorsement. Specifically, 20% of parents reported that coactivity allows parents to model lifelong healthy behaviors and lead by setting a positive example for their children. Some parents (12%) also noted the opportunity to teach healthy habits and the importance of being active. A smaller group of parents (5%) noted that coactivity would provide sportsmanship learning opportunities about rules, winning versus losing, and competition. No differences were identified across parental or child groupings ($p > .05$).

Control Beliefs of Parent–Child Activity

Control beliefs can be found in Table 4 (see also Table 2 for subtheme content). Time-related aspects were clearly the most endorsed barrier across all groups (76%) and this was not significantly different by parental gender or child age and sex ($p > .05$). Overall, lack of time (56% endorsed) and occupational work (20% endorsed) were the most common subthemes but were not different across groups ($p > .05$). Other

Table 2. Theme Representation of Behavioral and Control Beliefs.

Themes/subthemes	Example statements
Behavioral beliefs	
Interpersonal	
Bonding	(1) "Bond with child"
	(2) "Closeness"
	(3) "Stronger relationship"
Family time	(1) "Family unity"
	(2) "Quality time with my child"
	(3) "Be together"
Fun/enjoyment	(1) "Having fun, laughing and playing together"
	(2) "Making enjoyable memories"
	(3) "Doing things that we both enjoy"
Social/ communication	(1) "Interaction"
	(2) "It makes the neighbors come out to be sociable"
	(3) "Promotes good communication between parent and child"
Health	
Burn off energy	(1) "Burning off extra energy"
	(2) "Good for using up excess energy"
	(3) "Need to get rid of energy"
Exercise	(1) "Great exercise for all"
	(2) "Keeps them active"
	(3) "Exercise I normally would not engage in"
Fitness	(1) "Getting fit"
	(2) "Keeps us both fit"
	(3) "Physical fitness"
Health	(1) "Healthy lifestyle"
	(2) "Longer, healthier life"
	(3) "Better health for both"
Increase energy	(1) "High energy"
	(2) "Increased energy"
	(3) "More energy for myself"
Mental health	(1) "Less stress"
	(2) "Aids in better sleep"
	(3) "Better cognitive abilities"
Shape/weight	(1) "Lose weight"
	(2) "Maintaining a healthy weight"
	(3) "We all keep in shape"
Educational	
Encouragement	(1) "Encouraging fitness"
	(2) "Encourages child to be more active"
	(3) "Encouragement from parent"
Performance	(1) "Better at school"
	(2) "Improved sports skills/performance for my child"
Role-modeling	(1) "Lead by example"
	(2) "Sets positive example about physical activity"
	(3) "Modeling appropriate life-long behaviors"
Safety/ supervision	(1) "Safe entertainment"
	(2) "Supervise child"
	(3) "Safety"
Skill learning	(1) "Skill development"
	(2) "Teamwork and many other skills"
	(3) "Build social skills"
Sportsmanship	(1) "Value of competition"
	(2) "Winning and losing"
	(3) "Team building"
Teaching	(1) "Discipline"
	(2) "Teaching importance of being active"
	(3) "Teaches healthy habits"
Outdoors	(1) "Fresh air"
	(2) "Explore the outdoors"
	(3) "Appreciate nature"
Distract child	(1) "Away from television"
	(2) "Keep them from trouble"
	(3) "Gets them off the couch"
Control beliefs	
Time-related	
Busy	(1) "I am busy when he comes home from school"
	(2) "Busy lives"
	(3) "Too busy"
Chores	(1) "Chores get in the way"
	(2) "Housework"
	(3) "Not enough help around the house"
Lack of time	(1) "Time constraints"
	(2) "Running out of time"
	(3) "Lack of extra time"
Other family members	(1) "Having more than one child"
	(2) "Helping elder family members"
	(3) "New baby"
Other priorities/ activities	(1) "Evening meetings for parents"
	(2) "Busy with his own sports"
	(3) "Internet surfing"
Schedule	(1) "Busy schedules"
	(2) "Our schedules do not always coincide"
	(3) "Don't make time for it"
School/homework	(1) "He is in school all day, 5 days per week"
	(2) "Too much homework"
	(3) "Homework commitments"
Work	(1) "Working long hours"
	(2) "Shift work"
	(3) "Multiple jobs"
Health-related	
Health issues	(1) "Disabilities"
	(2) "Aches and pains"
	(3) "Emotional/mental health issues"

(Continued)

Table 2. (Continued)

Themes/subthemes	Example statements
Tired/fatigued	(1) "Energy disparity between child and myself"
	(2) "Too tired after working all day"
	(3) "Exhaustion"
Incompatibility	
Age	(1) "I am a MUCH older parent, 65 years old"
	(2) "I was older when I had my 9-year-old (45)"
	(3) "Ageing parent"
Activities	(1) "Sports that I cannot play with him"
	(2) "Lack of activities in the community for disabled children"
	(3) "We enjoy many different activities from each other"
Child's preference for friends	(1) "Wants to spend more time with her friends"
	(2) "Teenaged boy does not want to hang with parents"
	(3) "Kids are now focused on friends"
Interests	(1) "She is not interested in doing it with me"
	(2) "No fun to exercise"
	(3) "Each having different interests, no common interests"
Lazy/ wwunmotivated	(1) "They are lazy, I am lazy"
	(2) "No desire"
	(3) "Lack of motivation"
Skill/ability	(1) "Physical limitations due to age and agility"
	(2) "She would not want to do stuff at my pace"
	(3) "Different levels of fitness"
Money	(1) "Affordability"
	(2) "Lost wages"
	(3) "Low income"
Weather	(1) "Weather (rain, snow, too cold, too hot)"
	(2) "Very cold winters"
	(3) "I do not like heat"
Seasonal	(1) "Lack of daylight after school in fall and winter"
	(2) "Available time during daylight hours"
	(3) "Days getting shorter and colder"
Facilities/space	(1) "Lack of equipment"
	(2) "Space in the house for activities"
	(3) "No place to be active in the neighborhood"

priorities (e.g., busy with own sports, busy with evening parental meetings) as a theme was different among groups ($\chi^2_7 = 17.02$; $p = .02$), with mothers of girls aged 11 to 14 years reporting more priorities compared with fathers of girls aged 6 to 10 years ($p < .01$). Time aspects around scheduling, homework, and attending to other family members were less advocated subthemes and did not differ by group ($p > .05$).

Parents' perception of incompatible aspects between themselves and their children was endorsed by over a third of parents (34%). While this overall theme did not differ by the eight parental and child groupings ($p > .05$), these incompatible aspects included subthemes of activity differences (11% endorsed; e.g., sports I cannot play), low interest in participating in activities (8% endorsed; e.g., child not interested in activity with me), or a general unwillingness to be active with the child (11% endorsed; e.g., they are lazy, I am lazy). This general unwillingness or laziness to engage in coactivity was significantly different across the groups ($\chi^2_7 = 14.74$; $p = .04$), due to a difference of fathers of boys aged 11 to 14 years showing more unwillingness to be active than fathers of boys aged 6 to 10 years ($p < .05$). Lesser endorsed themes about preference for friends over parents and differences in skill were not different among the groups ($p > .05$).

Parental health-related barriers were the third most common control belief with just under a third of parents (30%) raising the theme, yet no significant differences emerged across the eight groups ($p > .05$). Subthemes of health issues (11% endorsed; e.g., aches and pains) and fatigue (23% endorsed; too tired, exhausted) were also not different across parent gender or child age and sex ($p > .05$).

Poor weather (17% endorsed), costs of coactivity (6% endorsed) were also endorsed among parents, albeit far less than the time, health, and child–parent incompatibilities barriers. None of these varied significantly by group ($p > .05$).

Program Preferences for Parent–Child Activity

The preferred types of coactivity can be found in Table 5. Hockey was significantly different across groups ($\chi^2 = 43.47$; $p < .01$). Fathers of boys aged 6 to 14 years and mothers of boys 11 to 14 years preferred playing hockey with their children compared with fathers of girls 6 to 10 years and mothers of girls 6 to 14 years and boys 6 to 10 years ($p < .01$). Soccer also showed asymmetry across the groups ($\chi^2 = 30.54$; $p < .01$). Fathers of boys aged 6 to 14 years and girls aged 6 to 10 years preferred to play soccer with their children compared with fathers of girls aged 11 to 14 years and mothers of girls and boys aged 11 to 14 years ($p < .01$). Fathers of boys aged 6 to 14 years also preferred soccer more than mothers of girls aged 6 to 10 years ($p < .01$). Swimming was significantly different ($\chi^2 = 16.42$; $p = .02$) across groups, with mothers of girls aged 11 to 14 years choosing this as a low preference in comparison with fathers of boys and girls aged 6 to 10 years and mothers of boys aged 6 to 14 years and girls aged 6 to 10 years ($p < .01$). Fathers of boys and girls aged 11 to 14 years also preferred swimming as a coactivity less than mothers and fathers of boys aged 6 to 10 years. Mothers of girls aged 11 to 14 years and fathers of boys aged 11 to 14 years also had the lowest preference for general play—indeed it did not get themed—compared with fathers of girls aged 6 to 10 years and mothers of boys aged 6 to 14 years and girls aged 6 to 10 years ($p < .01$). Finally, walking was one of the most

Table 3. Behavioral Beliefs About Parent–Child Coactivity.

		Fathers				Mothers			
		Boys		Girls		Boys		Girls	
Belief constructs	Total *N*	6-10 (*n* = 36), % (*n*)	11-14 (*n* = 42), % (*n*)	6-10 (*n* = 42), % (*n*)	11-14 (*n* = 39), % (*n*)	6-10 (*n* = 9 2), % (*n*)	11-14 (*n* = 77), % (*n*)	6-10 (*n* = 75), % (*n*)	11-14 (*n* = 80), % (*n*)
Interpersonal	340	78 (28)	57 (24)	62 (26)	85 (33)	74 (68)	60 (46)	76 (57)	73 (58)
Bonding	181	31 (11)	41 (17)	38 (16)	59 (23)	39 (36)	25 (19)	39 (29)	38 (30)
Family time	154	28 (10)	12 (5)	36 (15)	28 (11)	35 (32)	29 (22)	39 (29)	38 (30)
Fun/enjoyment	76	25 (9)	10 (4)	12 (5)	8 (3)	21 (19)	18 (14)	15 (11)	14 (11)
Social/communication	90	22 (8)	24 (10)	12 (5)	38 (15)	13 (12)	17 (13)	16 (12)	19 (15)
Health-related	380	67 (24)	74 (31)	86 (36)	72 (28)	82 (75)	74 (57)	80 (60)	86 (69)
Burn off energy	4	—	—	—	—	—	—	5 (4)	—
Exercise	121	22 (8)	17 (7)	33 (14)	26 (10)	29 (27)	21 (16)	24 (18)	26 (21)
Fitness	86	17 (6)	19 (8)	14 (6)	26 (10)	17 (16)	22 (17)	17 (13)	13 (10)
Health	244	36 (13)	52 (22)	55 (23)	36 (14)	57 (52)	48 (37)	52 (39)	55 (44)
Increase energy	11	—	5 (2)	5 (2)	—	—	9 (7)	—	—
Mental health	87	17 (6)	19 (8)	12 (5)	21 (8)	21 (19)	20 (15)	19 (14)	15 (12)
Shape/weight	38	8 (3)	7 (3)	7 (3)	8 (3)	9 (8)	10 (8)	5 (4)	8 (6)
Educational	184	44 (16)	29 (12)	43 (18)	38 (15)	42 (39)	30 (23)	33 (25)	45 (36)
Encouragement	12	—	—	5 (2)	5 (2)	—	—	5 (4)	5 (4)
Performance	2	—	5 (2)	—	—	—	—	—	—
Role-modeling	98	17 (6)	7 (3)	17 (7)	13 (5)	22 (20)	20 (15)	24 (18)	30 (24)
Skill learning	13	19 (7)	7 (3)	7 (3)	—	—	—	—	—
Sportsmanship	26	14 (5)	10 (4)	17 (7)	10 (4)	7 (6)	—	—	—
Safety and supervision	7	—	5 (2)	5 (2)	8 (3)	—	—	—	—
Teaching	57	19 (7)	5 (2)	10 (4)	13 (5)	19 (17)	9 (7)	5 (4)	14 (11)
Outdoors	24	6 (2)	—	10 (4)	5 (2)	7 (6)	7 (5)	7 (5)	—
Distract child	11	—	—	5 (2)	—	10 (9)	—	—	—

endorsed activities across all groups but this was not different in preference ($p > .05$). A low prevalence of other activities was also endorsed such as cycling, exergames, hiking, dance, baseball, martial arts, and basketball and were not different across groups ($p > .05$).

General preferences for coactivity program delivery are presented in Table 6. Most parents preferred to keep coactivity outside, within the backyard (81%) or local park (75%), and with all family members included (77%), and in the afternoon or evening, presumably after work hours. Most wanted the activity to be at a moderate intensity (65%) with variety (68%), and without supervision or structure. The preferred method of promotional contact was through fitness trained professionals (71%), followed by the family physician (39%) via Internet (e-mail, web) sources (54% and 57%, respectively), but not through telephone (3%) or video (9%). There were no significant differences ($p > .05$) in these preferences by parental gender or age and sex of the child.

Discussion

As hypothesized, only a select few beliefs emerged as important targets of parent–child coactivity that fall into the attitudinal and control domains. For behavioral beliefs, the health benefits of regular coactivity had very high advocacy regardless of grouping by child age, sex, or mother/father. This parallels general PA research in belief elicitation (Symons Downs & Hausenblas, 2005). Unfortunately, this ceiling effect is also suggestive that little might be gained about promoting PA through health education at the family level (Kitzman-Ulrich et al., 2010; O'Connor et al., 2009; Salmon et al., 2007; van Sluijs et al., 2011). Still approximately 20% of parents did not endorse health benefits as a behavioral belief, suggesting a health component of intervention should at least be present in interventions engaging parent–child coactivity.

More interesting, the interpersonal benefits of coactivity were also highly advocated across this sample of parents. While social benefits to PA are common in adult populations (Symons Downs & Hausenblas, 2005), an endorsement (70%) that was almost equal to the health benefits (79%) of PA is likely a direct result of the coactivity framing. Child–parent bonding and an opportunity for set family time were the most common subthemes of interpersonal-related behavioral beliefs regardless of parent gender and child age and sex. Taken together, we believe these results speak to the

Table 4. Control Beliefs About Parent–Child Coactivity.

		Fathers				Mothers			
		Boys		Girls		Boys		Girls	
Control beliefs	Total	6-10 (*n* = 36), % (*n*)	11-14 (*n* = 42), % (*n*)	6-10 (*n* = 42), % (*n*)	11-14 (*n* = 39), % (*n*)	6-10 (*n* = 92), % (*n*)	11-14 (*n* = 77), % (*n*)	6-10 (*n* = 75), % (*n*)	11-14 (*n* = 80), % (*n*)
Time-related	367	83 (30)	67 (28)	74 (31)	79 (31)	78 (72)	68 (52)	80 (60)	79 (63)
Busy	45	14 (5)	—	12 (5)	10 (4)	9 (8)	9 (7)	8 (6)	13 (10)
Chores	28	8 (3)	—	7 (3)	15 (6)	11 (10)	—	—	8 (6)
Lack of time	270	58 (21)	52 (22)	50 (21)	59 (23)	61 (56)	44 (34)	67 (50)	54 (43)
Other family members	32	6 (2)	7 (3)	7 (3)	—	12 (11)	—	11 (8)	6 (5)
Other priorities/activities	51	17 (6)	7 (3)	—	8 (3)	10 (9)	12 (9)	9 (7)	18 (14)
Schedule	31	6 (2)	5 (2)	5 (2)	13 (5)	—	8 (6)	8 (6)	10 (8)
School/homework	31	11 (4)	7 (3)	10 (4)	—	7 (6)	5 (4)	—	13 (10)
Work	96	28 (10)	19 (8)	26 (11)	23 (9)	21 (19)	16 (12)	15 (11)	20 (16)
Health-related	144	14 (5)	24 (10)	26 (11)	21 (8)	35 (32)	26 (20)	36 (27)	39 (31)
Health issues	55	8 (3)	10 (4)	14 (6)	8 (3)	11 (10)	12 (9)	11 (8)	15 (12)
Tired/fatigued	110	6 (2)	14 (6)	12 (5)	16 (6)	25 (23)	25 (19)	32 (24)	31 (25)
Incompatibility	164	19 (7)	43 (18)	24 (10)	38 (15)	29 (27)	43 (33)	31 (23)	39 (31)
Age	26	8 (3)	10 (4)	—	10 (4)	—	—	9 (7)	10 (8)
Activities	52	8 (3)	5 (2)	5 (2)	10 (4)	13 (12)	18 (14)	12 (9)	8 (6)
Child's preference for friends	20	—	7 (3)	5 (2)	8 (3)	—	9 (7)	—	6 (5)
Interests	40	—	7 (3)	10 (4)	10 (4)	8 (7)	16 (12)	8 (6)	5 (4)
Lazy/no motivation	54	—	21 (9)	10 (4)	10 (4)	8 (7)	14 (11)	12 (9)	13 (10)
Skill/ability	26	6 (2)	5 (2)	—	8 (3)	—	5 (4)	7 (5)	13 (10)
Money/resource	29	8 (3)	12 (5)	5 (2)	8 (3)	—	5 (4)	11 (8)	5 (4)
Weather	82	8 (3)	17 (7)	24 (10)	8 (3)	23 (21)	14 (11)	17 (13)	18 (14)
Seasonal (daylight)	5	—	—	–	—	5 (5)	—	—	—
Facilities/space	6	—	—	—	—	—	—	8 (6)	—

potential that parents see in coactivity for retaining parent–child relationships during childhood and early adolescence. While some interventions have explored the pairing of tweens and parents in past PA research (O'Connor et al., 2009), it seems this approach needs further investigation. The interpersonal aspects of family fun were also commonly cited among all groups. This supports the approach taken in child PA campaigns such as *VERB* (Wong, Huhman, Berkowitz, Cavill, & Maibach, 2008), where fun has been emphasized heavily alongside the health benefits.

The learning, sportsmanship, and skill development aspects of coactivity were a less frequently mentioned behavioral belief theme but still endorsed by over a third of the sample. This may be one of the successful ingredients in the *Healthy Kids, Healthy Dads* intervention (Morgan et al., 2011) aimed at adding some of these potential educational aspects to coactivity. Continued exploration of the educational and coaching opportunities for coactivity may represent an engaging leadership opportunity for parents to complement the health and social aspects of the activities with their children.

Control beliefs are especially important during the consideration of creating successful interventions, because they represent the dominant predictor of coactivity behavior (Rhodes et al., 2015). Parents all reported lack of time as the major reason for inactivity with one's child with occupational work duties as the primary factor. This is an important recognition, because it highlights how our contemporary society may be imposing on family health through occupational work (Kirk & Rhodes, 2011). It is also important because, short of changing work practices for parents, there may be limited downstream (e.g., individual and community) forms of intervention that can be successful (Davison et al., 2013; Davison, Lawson, & Coatsworth, 2012) and could explain why so many individual-level interventions have had null results (O'Connor et al., 2009).

An interesting control belief that seems very specific to coactivity was the potential perceived incompatibility between parents and their children and this was raised by about a third of the sample. Fathers of younger children viewed themselves as more compatible for coactivity than as fathers of tweens. The reasons for incompatibility appeared to be a mix of differences in perceived interests, activities, skills, and overall motivation. This suggests that interventions that help parents and their children work on commonalities in activity, particularly during early adolescence, may have utility. Still it is also likely that some

Table 5. Percentage of Preferences for Activities Between Parent and Child.

	Fathers				Mothers			
	Boys		Girls		Boys		Girls	
Activities	6-10 (*n* = 36)	11-14 (*n* = 42)	6-10 (*n* = 42)	11-14 (*n* = 39)	6-10 (*n* = 92)	11-14 (*n* = 77)	6-10 (*n* = 75)	11-14 (*n* = 80)
Badminton	—	5	5	—	—	—	—	—
Baseball	14	7	—	—	—	—	—	—
Basketball	7	—	5	—	5	5	—	—
Circuit training	—	—	—	—	—	5	—	—
Cycling	11	17	10	10	11	10	5	11
Dance	—	—	—	5	—	—	—	—
Dog walking	—	—	5	—	—	—	—	—
Exergames	6	—	—	—	—	—	7	5
Gardening	—	—	—	5	—	—	—	—
Golf	6	—	—	—	—	—	—	—
Hiking	—	12	7	8	9	6	—	—
Hockey	31	12	—	5	—	13	—	—
Martial arts	—	7	—	—	—	—	—	—
Play	8	—	19	10	17	10	12	—
Rugby	6	—	—	—	—	—	—	—
Running	—	5	10	8	7	—	—	5
Soccer	22	17	12	—	8	—	5	—
Sports	6	—	—	—	—	—	—	—
Swimming	17	5	17	5	18	13	15	—
Walking	8	12	10	21	30	27	24	34

parents are responding based on the feedback from their tweens, who may not want to participate in activity with their parents. Further research exploration of this aspect of parent–child incompatibility from the perspective of the child would be helpful to fully understand this control belief.

Health-related issues such as lack of energy and mental or physical health ailments among parents were also prevalent barriers. These pose a challenge for coactivity. Fatigue was by far the most reported health barrier, however, representing just less than a quarter of the sample. Strategic ways to plan for coactivity may help parents find the energy for play with their children (Rhodes et al., 2016), but fatigue is a challenging barrier for PA generally (Canadian Fitness and Lifestyle Research Institute, 2014).

Finally, weather and limited daylight hours represented an unsurprising Canadian barrier to parent–child coactivity which has been well-recognized (Carson & Spence, 2010). Alternative strategies for indoor activities seem warranted. Interestingly, access to facilities and the costs of activity were endorsed as barriers by very few parents, suggesting the built environment is not one of the critical points of intervention. This is likely because most parents perceive strong PA infrastructure and programming in Canada (Canadian Fitness and Lifestyle Research Institute, 2014), and not due to its lack of importance overall.

Our exploration of the program preferences for coactivity also shed light on some potentially important areas for future research in program development and for reaching parents. Hockey, for example, was clearly a preferred activity for boys, while soccer was less sex-specific. Furthermore, parents of children in their tweens preferred less structured sports and veered in preferences toward lifestyle activities. Swimming and general play was a preferred activity for younger children. These findings suggest some necessary targeting depending on parent gender and the age of the child. Still one of the more striking findings was the general low endorsement of any activities. While this speaks to the low prevalence of parent and child PA generally, it also suggests that parents and their children may benefit from exposure to various activities in PA programming. It seems, from these results, that it should not be assumed that parents have strong and established preferences.

In terms of program delivery, parents preferred to keep PA in the home or backyard during the afternoon/evening and to be as inclusive as possible without structure. Some of the most successful coactivity programs (Morgan et al., 2011; O'Dwyer et al., 2012), have been community-based and may lack the reach desired by most parents. Interventions delivered in the home seem highly worthy of further investigation. The preferred method of promotional contact was through trained community professionals via Internet sources. Hybrid points

Table 6. Parent Preferences for Child Coactivity.

		Fathers				Mothers			
		Boys		Girls		Boys		Girls	
Characteristic	Total (*N* = 483)	6-10 (*n* = 36)	11-14 (*n* = 42)	6-10 (*n* = 42)	11-14 (*n* = 39)	6-10 (*n* = 92)	11-14 (*n* = 77)	6-10 (*n* = 75)	11-14 (*n* = 80)
Venue									
% at home	56	51	43	52	88	51	48	57	63
% Backyard/neighborhood	81	89	86	91	30	85	86	79	83
% Recreation center	43	51	45	50	70	33	41	51	26
% Parks	75	77	67	83	35	84	78	83	70
Time of day									
% Morning	31	34	31	24	35	40	26	28	28
% Afternoon	65	69	62	79	73	68	51	64	59
% Evening	67	77	67	50	60	67	71	59	76
Family included									
% All family members	77	89	64	76	88	76	78	75	71
%Young children only	31	31	29	43	20	33	19	39	31
% Extended family	17	23	12	7	20	18	15	19	20
% Others outside the family	18	14	10	7	23	25	19	13	24
Intensity preference									
% Light	22	14	12	14	18	24	26	21	31
% Moderate	65	66	74	74	60	70	55	61	61
% Vigorous	10	20	12	10	18	4	13	12	5
Variety									
% Same types of activities	28	23	33	31	28	28	30	25	28
% Different activities	68	77	57	60	68	69	65	70	68
Supervision									
% Instructor facilitation	21	20	17	21	10	22	18	32	16
% Self-paced activities	76	74	81	69	86	75	75	65	79
Planning style									
% Spontaneous/flexible	65	71	64	62	70	68	70	52	63
% Scheduled	33	26	29	33	28	31	25	47	34
Contact preference									
% Physician	39	37	38	31	40	42	38	43	34
% Nurse	16	8	12	10	3	16	13	32	18
% Fitness expert/professional	71	74	62	69	78	73	71	68	75
% Researcher/scientist	20	11	26	14	15	27	18	17	24
Information contact mode									
% Telephone	3	3	2	0	8	4	1	1	4
% E-mail	54	49	45	50	55	56	50	59	56
% Internet/website	57	54	57	62	63	59	54	52	56
% Print brochure	45	46	36	43	33	46	44	49	48
% Face-to-face	31	34	33	19	23	34	33	29	36
% Self-instruction video	9	0	12	2	13	11	13	12	6

Note. Categories are not mutually exclusive.

of contact (e.g., face-to-face, followed by Internet sources) may serve best, given the expense of face-to-face and the generally low effectiveness of pure web-based intervention (Davies, Spence, Vandelanotte, Caperchione, & Mummery, 2012). Of promise, our results showed no differences in these preferences by the age/sex of the child or between mothers and fathers suggesting that tailoring to these specific family coactivity demographics may not be necessary.

Despite the interesting findings, the results still have noteworthy limitations. First, there was good representation of the Anglophile Canadian population but not of Quebec. Future research may need to examine how these results

generalize to French Canadians. Our elicitation procedure had coverage of the behavioral and control beliefs residing in the TPB but other theoretical approaches may yield different insights. Our exploratory analyses across parental gender, and child age and sex included several tests so type one error may have affected the findings. Replication of these results is required before and definitive conclusions can be drawn. The focus on parents also represents only one side of the cooperative parent–child activities. Research exploring coactivity from the perspective of the child would help fully understand the topic. Finally, the proportion analyses across beliefs were powered to detect medium-sized effects so small effect sizes, that could still be important in larger scaled intervention campaigns, would not show significant differences in these results.

In summary, family PA where parents and their children are active together would be an excellent means of improving overall family health, but most current interventions have been unsuccessful. In this study, we study elicited beliefs and program preferences about coactivity for a better understanding of what we may need to target in future intervention research. The results showed that behavioral beliefs about the health, interpersonal, and educational learning opportunities and control beliefs about lack of time, various incompatible factors between parents and their children, parental health-related aspects, and weather barriers were dominant themes. Many of these did not vary by gender of the parent and age and sex of the child but the results clearly support interventions that focus on the family-level social benefits of coactivity alongside promotional messages about its health benefits. Interventions that attempt to overcome perceived parental time limitations, parental fatigue, and the Canadian winter weather are also recommended. Our results about programming preferences may be a first start on how to approach these coactivity control barriers. Interventions may be most likely to succeed if they are offered close to the family home and outside, after work, and delivered from community health professionals via Internet or face-to face means.

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