Parental Social Support and the Physical Activity-Related Behaviors of Youth: A Review

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Parental Social Support and the Physical Activity–Related Behaviors of Youth: A Review

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Social support from parents serves as one of the primary influences of youth physical activity–related behaviors. A systematic review was conducted on the relationship of parental social support to the physical activity–related behaviors of youth. Four categories of social support were identified, falling under two distinct mechanisms—tangible and intangible. Tangible social support is divided into two categories: instrumental—purchasing equipment/payment of fees and transportation—and conditional—doing activity with and watching/supervision. Intangible social support is divided into the two categories of motivational—encouragement and praise—and informational—discussing benefits of. The majority of studies demonstrated positive associations among selected measures of parental tangible and intangible social support and youth activity. Overall, parental social support demonstrated positive effects. Many studies, however, combine social support categories and/or respondents into composite measures, making it difficult to disentangle the specific effects of parents and the type of support provided.

Keywords: *family; adolescents; childhood; health behavior; social support*

Nationally, the percentage of children and adolescents who meet the recommendation (U.S. Department of Health and Human Services [USDHHS], 2008) of 60 minutes of daily physical activity is unacceptably low. Recent estimates indicate approximately 42% of from 6- to 11-year-olds and only 8% of from 12- to 17-year-olds meet daily recommendations (Troiano et al., 2008). Parents (e.g., parents or other adult caretakers in the home) are considered to be one of the primary influences on the activity-related behavioral patterns (e.g., sports, outdoor play, exercise) of youth (i.e., children and adolescents; Brustad, 1993; Kohl & Hobbs, 1998; Lindsay, Sussner, Kim, & Gortmaker, 2006; Sallis, Prochaska, & Taylor, 2000). They serve as models, reinforcers, and advocates of both health enhancing and health compromising behaviors and, as such, they have the potential for altering the ever increasing sedentary nature of the lifestyles exhibited by today's youth (USDHHS, 2001). Such emphasis is predicated on the fact that the majority of youth spend roughly 18 years of their life in close proximity to their

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parents (Goldscheider, Thornton, & Young-DeMarco, 1993). During the course of this time, parents exert considerable influence over the health-related behaviors of their children (Perry, Crockett, & Pirie, 1987; Schor & American Academy of Pediatrics Task Force on the Family, 2003) and are one of the immediate and primary sources of health information and education (Hopper, Gruber, Munoz, & Herb, 1992). These interactions have also demonstrated lasting effects on subsequent adult activity-related behavioral patterns (A. M. Thompson, Humbert, & Mirwald, 2003). In addition, parents serve a "gate keeper" role to physical activity (Welk, Wood, & Morss, 2003), controlling access to community activity and sport programs (Atsalakis & Sleap, 1996; Boufous, Finch, & Bauman, 2004) and access to outdoor environments (Klesges, Eck, Hanson, Haddock, & Klesges, 1990) where activity can take place. Therefore, especially during childhood (from 5 to12 years old) when behaviors are under less volitional control, parents are one of the primary providers of inhibitory and promotive opportunities whereby children can be active.

Parents influence their children's activity behaviors through a variety of means (Taylor, Baranowski, & Sallis, 1994). This includes parents' own activity levels, either through modeling or familial aggregation of activity patterns (Moore et al., 1991; Raudsepp & Viira, 2000; Sallis, Patterson, Buono, Atkins, & Nader, 1988); parental attitudes, beliefs, and values toward activity (Dempsey, Kimiecik, & Horn, 1993; Eccles & Harold, 1991; Kimiecik, Horn, & Shurin, 1996); genetic lineage (Pérusse, Tremblay, Leblanc, & Bouchard, 1989); and social support for activity (Sallis, Alcaraz, McKenzie, & Hovell, 1999a; Sallis et al., 1992; Trost et al., 2003a). Of these, the presence of social support, which consists of indirect verbal and nonverbal support and direct tangible assistance positively impacts children's and adolescents' activity levels (Sallis et al., 2000). However, although evidence corroborating the role of parental social support and activity has accumulated, inconsistencies among findings exist as to what types (i.e., tangible, intangible), providers (i.e., mother or father), and characteristics of the recipients (e.g., gender, age, weight status) are related to increased activity levels. Complicating matters further is the lack of distinction among similar, yet conceptually unique, constructs of social interactions (e.g., social norms, modeling). If practitioners are to successfully plan, implement, and evaluate family-based social support interventions, questions pertaining to who should be involved, what those involved should provide, when it should be provided, and to whom it should be provided need clear delineation. The purpose of this article is to address these questions by conducting a systematic review of literature on the provision of social support by parents and its relation to youth (<18 years old) physical activity levels in an attempt to address these identified needs.

METHOD OF LITERATURE REVIEW

An extensive review of published literature in the English language from 1970 to August 2008 was conducted using the following key terms in various combinations: "physical activity," "sports," "children," "adolescent," "youth," "parent," and "social support." Additional key terms were used for the dimensional aspects of support: "transportation," "encouragement," "prompts," "financial," and "praise." The following databases were used: EBSCOhost, Academic Search Premier, Alt HealthWatch, CINAHL, MEDLINE, Health Source: Nursing/Academic Edition, Health Source: Consumer Edition, Middle Search Plus, Psychology and Behavioral Sciences Collection, Primary Search, PsycINFO, PubMed, and SPORTDiscus. Furthermore, given the lack

of consistency in terminology (addressed later in this article), additional terms—"social norms," "social influence," and "social provisions"—were included. Additional studies were identified through book chapters, review articles, and reference lists of previously published work. In the context of the current review, *physical activity* is used to define any bodily movement that results in energy expenditure. This definition allows for the inclusion of both organized (e.g., sports) and nonorganized (e.g., free play) physical activities. Information from each article was extracted using standardized forms developed specifically for this study. Information regarding sample characteristics (age of youth, parent reference—mother, father, female adult, male adult), physical activity measures, social support definitions and dimensions (see below), direction of the effect (positive, negative or no association), and whether the article was quantitative or qualitative was compiled by the authors. Because family and parent terms were used to refer to similar referents—male/female adult, dad/mom—articles that used one or the other were included in the review. Based on the heterogeneity of the research included in the review, a quantitative analysis (i.e., meta-analysis) was deemed inappropriate. Rather, a narrative approach was employed, allowing for the inclusion of both quantitative as well as qualitative research.

Inclusion–Exclusion Criteria

This review article focuses on the influence of parent-provided social support for physical activity of typically developing children and adolescents (<18 years old) in the community, home, and school settings. Articles were excluded that focused on youth with various complications associated with physical and mental disabilities or with special health care needs and those with unhealthy weight gains located within a clinical or residential treatment facility. Readers interested in family involvement in such populations are referred to an overview article by McLean, Griffin, Toney, and Hardeman (2003). Studies must have also measured one of the characteristics of social support (defined below) by either parent assessment or as perceived by the child/adolescent (i.e., self-report) along with physical activity and/or sport involvement of the child/adolescent. Qualitative studies regarding physical activity behaviors and parental influences were also included.

Literature examining familial aggregation (Aarino, Winter, Kujala, & Kaprio, 1997; Freedson & Evenson, 1991; Gilmer, Harrell, Miles, & Hepworth, 2003; Moore et al., 1991; Pérusse, LeBlanc, & Bouchard, 1988; Sallis et al., 1988) of activity patterns focusing on modeling as a form of influence by specifying the level of activity of parents and their children, without reference to the proportion of the reported activity performed together (e.g., mother–child, father–child), were excluded. Although illustrative of the similarity of activity levels that exist within a family, such studies do not meet the requirement for describing social supportive behaviors as specified for this review. Additionally, intervention studies attempting to increase social support were not included, given the experimental manipulation of social support in relation to physical activity. Readers interested in findings from intervention studies are directed to the article by O'Connor, Jago, and Baranowski (2009).

Terminology—Social Support

Operationalizations of social support are ubiquitous, and depending on the nature of the behavior in question, the variables being measured, and the guiding hypotheses

proposed, vary considerably across studies. Social support is conceptually different from social norms, modeling, social influence, and social networks (Barrera, 1986; Courneya, Plotnikoff, Hotz, & Birkett, 2004; Heaney & Israel, 2002; Israel & Rounds, 1987), yet it has been used interchangeably with these constructs both within and across studies (e.g., Davison & Schmalz, 2006) and reviews (Pugliese & Tinsley, 2007). This lack of conceptual precision adds to the vagueness of the social support mechanisms being examined and, subsequently, the interpretation of results in this area of research and the possibility of invalid operationalizations (Thoits, 1982). This has been addressed in previous reviews (Barrera, 1986; McNeill, Kreuter, & Subramanian, 2006; O'Reilly, 1988; Thoits, 1982; Wallston, Alagna, DeVellis, & DeVellis, 1983) and is viewed as a persistent limiting factor when attempting to synthesize the body of literature on this topic.

Therefore, the following multidimensional definition is proposed and was used as a guiding framework for this review. Social support represents the functional characteristics associated with the interactions between a parent and his or her children in the context of intentionally participating in, prompting, discussing, and/or providing activity-related opportunities. Social support is, therefore, a multidimensional umbrella term used to describe various ways in which significant referents, in this case parents, knowingly influence the activity behaviors of their children and may include some, but not necessarily all, functional dimensions of support. Furthermore, social supportive behaviors may consist of both tangible behaviors, such as providing transportation to places where the child can be active, and intangible behaviors, such as encouraging one's child to be physically active.

LITERATURE FINDINGS

A total of 1,322 references matched the keyword criteria. References were subjected to further scrutiny for relevance. This resulted in a total of 80 articles meeting the review criteria. Social support was examined as a composite measure or index score (e.g., principal component factor analysis), as single item indicators, or was discussed through focus groups in qualitative papers. Of these, 66 (82.5%) reported the relationship between social support and measured physical activity (e.g., self-report, accelerometer, pedometer). Within this group, 29 studies (44%) used a composite measure (combining social support dimensions). The remaining 14 studies (17.5%) either reported differences in social support among gender or ethnic groups or described social support qualitatively. The results of the search are presented in Table 1 and a listing of the corresponding studies in Table 2.

The four primary functional dimensions of support consistent within the literature identified by the review include: *instrumental*—provision of tangible aid and services; *conditional*—direct involvement of the parent in the activity or being physically present, yet not directly participating when the activity occurs; *motivational*—provision of verbal and nonverbal prompts to engage in the behavior of interest and validation and affirmation of involvement in or performance of physical activity; and *informational*—provision of advice, suggestions, and information to address the behavior of interest. Collectively, social support is described as exhibiting, at minimum, one of these dimensions, which can be grouped into two broad categories: tangible and intangible supportive behaviors (see Table 3).

Table 1. Number of Null and Positive Findings for Studies ($N = 66$) Investigating the Relationship Between Parental Social Support Types and Measured Physical Activity of Children and Adolescents

Dimension	Type	Boys			Girls			Boys and Girls			Total			Studies (n)[d]	Total Studies (%)[e]
		0[a]	+[b]	% +[c]	0[a]	+[b]	% +[c]	0[a]	+[b]	% +[c]	0[a]	+[b]	% +[c]		
Instrumental	Transportation	3	2	40	3	4	57	1	4	80	7	10	59	11	17
	Payment of fees and/or equipment	1	1	50	1	1	50	0	0	—	2	2	50	4	6
Conditional	Performed activity with	1	6	86	3	6	67	3	5	63	7	17	71	18	27
	Watching/Supervision	1	0	0	1	0	0	2	3	60	4	3	43	6	9
Motivational	Encourage	2	8	80	4	12	75	5	9	64	11	29	73	31	47
	Praise	—	—	—	—	—	—	1	3	75	1	3	75	4	6
Informational	Discuss importance/health benefits	0	0	—	0	0	—	1	0	0	1	0	0	1	2
Composite		5	5	50	6	13	68	4	8	67	15	26	63	29	44

a. 0 = null findings.
b. + = positive findings.
c. Percentage of studies reporting a positive association between social support and physical activity (i.e., social support related to increased or greater amounts of physical activity).
d. Number of unique studies reporting a positive association between social support and physical activity (i.e., social support related to increased or greater amounts of physical activity).
e. Percentage of studies reporting outcomes for each social support type and composite out of 66 (total number of studies linking parental social support to physical activity). Note: the total percentage does not add up to 100% because of studies reporting, separately, on one or more social support types.

Table 2. Studies Reporting Parental Social Support Relationships Related to Measured Physical Activity Levels of Youth

		Boys		Girls		Boys and Girls	
Dimension	Type	0[a]	+[b]	0[a]	+[b]	0[a]	+[b]
Instrumental	Transportation	Hovell et al. (1996) Morgan et al. (2003) Sallis et al. (1992)	Hoefer et al. (2001) Sallis et al. (1999a)	Adkins et al. (2004) Brown (1985) Hovell et al. (1996)	Hoefer et al. (2001) Morgan et al. (2003) Sallis et al. (1999a) Sallis et al. (1992)	Duncan et al. (2005)	Beets et al. (2006) Heitzler et al. (2006) Morgan et al. (2003) Prochaska et al. (2002)
	Payment of fees and/or equipment	Stucky-Ropp & DiLorenzo (1993)	Sallis et al. (1999a)	Sallis et al. (1999a)	Stucky-Ropp & DiLorenzo (1993)		
Conditional	Performed activity with	Morgan et al. (2003)	Beets et al. (2007) Hovell et al. (1996) Ornelas et al. (2007) Sallis et al. (1992) Sallis et al. (1999a) Wilson & Dollman (2007)	Adkins et al. (2004) Morgan et al. (2003) Sallis et al. (1992)	Hovell et al. (1996) Ornelas et al. (2007) Sharma et al. (2008) Springer et al. (2006) Sallis et al. (1999a) Wilson & Dollman (2009)	Beets et al. (2006) Duncan et al. (2005) Klesges et al., (1990)	Beets & Foley (2008) Prochaska et al. (2002) Heitzler et al. (2006) Nelson et al. (2005) Welk et al. (2003)
	Watching/ Supervision	Beets et al. (2007)		Beets et al. (2007)		Beets et al. (2006) Brown (1985)	Duncan et al. (2005) Heitzler et al. (2006) Prochaska et al. (2002)
Motivational	Encourage	Beets et al. (2007) Sallis et al. (1992)	Anderssen & Wold (1992) Bauer et al. (2008) Brustad (1996) Elder et al. (1998) McGuire et al. (2002)	Adkins et al. (2004) Beets et al. (2007) Sallis et al. (1992) Sallis et al. (1999a)	Anderssen & Wold (1992) Bauer et al. (2008) Brown (1985) Brustad (1996) Butcher (1985) Elder et al. (1998)	Beets et al. (2006) Duncan et al. (2005) Klesges et al. (1990)	Allender et al. (2006) Biddle & Goudas (1996) Brustad (1993) Cardon et al. (2005) De Bourdeaudhuij et al. (2005)

(continued)

Table 2. (continued)

Dimension	Type	Boys		Girls		Boys and Girls	
		0[a]	+[b]	0[a]	+[b]	0[a]	+[b]
			O'Loughlin et al. (1999) Sallis et al. (1999a) Wilson & Dollman (2007)		King et al. (2008) McGuire et al. (2002) O'Loughlin et al. (1999) Sharma et al. (2008) Springer et al. (2006) Wilson & Dollman (2009)	Prochaska et al. (2002) Timperio et al. (2008)	Fredricks & Eccles (2005) Hohepa et al. (2007) Klesges et al. (1986) Sabiston & Crocker (2008)
	Praise					Timperio et al. (2008)	Arredondo et al. (2006) Beets et al. (2006) Prochaska et al. (2002)
Informational	Discuss importance/ health benefits					Duncan et al. (2005)	
Composite		Frenn et al. (2005) DiLorenzo et al. (1998) Higgins et al. (2003) Wu et al. (2003) Zakarian et al. (1994)	Davison (2004) Greendorfer & Lewko (1978) Lewko & Ewing (1980) Sallis et al. (1999b) Sallis et al. (2002)	Adkins et al. (2004) Bungum & Vincent (1997) DiLorenzo et al. (1998) Higgins et al. (2003) Wu et al. (2003)	Davison et al. (2003) Davison (2004) Dowda et al. (2007) Frenn et al. (2005) Greendorfer &Lewko (1978) Ievers-Landis et al. (2003) Kuo et al. (2007) Lewko (1978) Lewko & Ewing (1980) Neumark-Sztainer et al. (2003) Sallis et al., (1999b) Sallis et al. (2002) Saunders et al. (2004) Zakarian et al. (1994)	Hamilton & White (2008) Timperio et al. (2008) Trost et al. (2003b) Wu et al. (2002)	Davison & Schmalz (2006) Frenn et al. (2005) Garcia et al. (1995) Heitzler et al. (2006) Ommundsen et al. (2006) Strauss et al. (2001) Trost et al. (2003a) Welk et al. (2003)

a. 0 = null findings.
b. + = positive findings.

Table 3. Social Support Definition Based on Review of Literature

Category	Dimension	Definition	Parental Behaviors	Example Items
Tangible	Instrumental	Provision of tangible aid and/or services	Transportation	"[Referent] provided transportation for physical activity"
			Payment of fees	"[Referent] provided money for participation"
			Enrolment in physical activity/sports	"How active are you in enrolling your daughter/son in sports?"
			Purchase equipment	"Buy sports clothing/equipment for their child"
	Conditional	Directly involved or within proximity of the activity with the child	Perform activity with	"Offered to do physical activities with me"
				"Actively participate in physical activity with the child"
				"[Referent] did physical activity with you"
				"Family use of physical activity as recreation"
			Watching	"How often do you go to your daughter's/son's sporting events with her/him?"
Intangible	Motivational	Provision of verbal/nonverbal prompts to engage in the behavior of interest, validation and affirmation of involvement or performance from participating in the behavior	Encouragement	"Encourage their child to go outside"
				"How frequently their [referent] encourages them to be physically active"
			Praise	"Praised their child for participation in physical activity"
	Informational	Provision of advice, suggestions, and information to address the behavior of interest	Discuss importance of physical active/participation in sports	"[Referent] told you physical activity was good for your health"
			Discuss how to be active	

Support Types—Tangible

Tangible support, considered one of the most effective means of support for physical activity (Sallis et al., 1992; Trost et al., 2003a), comprises overt behaviors performed by parents that *directly* facilitate the involvement in activity. This support includes tangible aid given by parents such as providing transportation to places where the child can engage in a variety of activity-related behaviors, such as sports, team practices, play with friends, or play at local community parks/recreation facilities (Davison, Cutting, & Birch, 2003). This type of support may also include direct involvement of the parents in the activity with the child, such as playing together, using family time to be active (V. J. Thompson et al., 2003; Welk et al., 2003), or parents serving as spectators or supervisors as the activity occurs (Beets, Vogel, Chapman, Pitetti, & Cardinal, 2007; Duncan, Duncan, & Strycker, 2005). Less commonly measured is the purchasing of equipment and payment of fees that afford opportunities to be active or facilitate activity involvement (Davison et al., 2003; Sallis et al., 1999a). Each of these is discussed in the following sections.

Instrumental—Transportation. One of the major barriers for children to participate in activity-related behaviors is the ability to access places (e.g., parks/playgrounds, sport practices/meets) where the child can be active (Davison & Lawson, 2006; O'Dea, 2003). Of the studies reviewed, 11 (17%) reported findings linking transportation social support to youth activity levels. Cross-sectional analyses indicate parental provision of transportation is a key component to youth accessing these places and is linked to greater levels of activity (Beets, Vogel, Forlaw, Pitetti, & Cardinal, 2006; Heitzler, Martin, Duke, & Huhman, 2006; Hoefer, McKenzie, Sallis, Marshall, & Conway, 2001; Sallis et al., 1992; Sallis et al., 1999a). These associations are rather robust, with transportation appearing as a predictor of activity levels from both self-report and objective physical activity measures (Sallis et al., 1992). This relation has also been found in longitudinal studies. During a 20-month period, transportation proved to be the only supportive behavior provided by parents predictive of change in activity for both boys and girls (Sallis et al., 1999a). Apart from activity levels, transportation is related to levels of adiposity in girls, with leaner girls (based on skinfolds and BMI) receiving more parental transportation to places where they can be active than their heavier counterparts (Hovell, Kolody, & Sallis, 1996). Transportation is also linked to increased cardiovascular fitness (i.e., mile run/walk time; Sallis et al., 1992).

Although limited in the ability to draw substantive conclusions regarding variations in supportive behaviors among various ethnic groups, a study of Native American children indicated that 80% of the children reported their parents take them to places where they can be active, suggesting a high degree of involvement of the parents in this community (J. L. Thompson et al., 2001). Conversely, Hispanic youth receive considerably less transportation to places to be active than their ethnic counterparts (Hoefer et al., 2001). Thus, preliminary differences have been identified, yet whether these are tied to cultural influences regarding parenting practices, socioeconomic status, or parental perceptions of safety (Sallis, McKenzie, Elder, Broyles, & Nader, 1997) requires further investigation.

Children report transportation as one of the common forms of social support they receive from their parents. In addition, children have also expressed the desire to receive greater amounts of this form of social support (Wright, Wilson, Griffin, & Evans, 2008). This is perhaps because of the inability of children to self-transport to

places where they can participate in activities, thereby necessitating parental involvement. Activities such as sports, community organized programs, and access to playgrounds and parks are likely to require parental transportation, especially if the distance from their home is considerable or environmental barriers such as street design and heavy traffic volume limits access by means of walking or biking (Hoefer et al., 2001). As few residents are located within walking or biking distance of parks/playgrounds, greater reliance on parents to assist in accessing neighborhood and city public spaces (e.g., parks) may be required. Importantly, the provision of transportation does not require parents to be active themselves. Inactive parents, therefore, can have active children simply by facilitating their ability to access places where they can be active (Trost et al., 2003a).

Instrumental—Payment of Fees/Purchasing Equipment. Only four studies (6%) assessed the association of parental payment of fees and purchase of equipment to activity-related behaviors. Though limited in number, these studies do indicate that mothers and fathers purchase more equipment for boys than girls for sport-related activity (Fredricks & Eccles, 2005), and payment of fees has been associated with higher activity levels of boys during a 20-month period (Sallis et al., 1999a). The long-term beneficial consequences of reducing financial barriers to activity during childhood are the development of positive activity-related memories, which may contribute to greater levels of adult activity participation, especially for women (A. M. Thompson et al., 2003). The provision of money may be a fruitful means by which adolescent boys and girls (from 10 to 14 years old) can be more physically active (Wright et al., 2008).

Both cost and lack of equipment have been found to be unrelated to perceived behavioral control for involvement in vigorous activity (Craig, Goldberg, & Dietz, 1996), suggesting youth can participate in high intensity activities without encountering financial barriers. This finding may also signify the need to differentiate the different domains of activity—free play versus sports—whereby the latter is more likely to have costs and equipment barriers associated with involvement. High costs associated with involvement are rated as the number one reason for nonparticipation in school–community sport and nonsport activities (Hultsman, 1993). Financial hardships also vary by the type of sport in which one participates (Baxter-Jones & Maffulli, 2003) and reduce the opportunity to engage in more formal school- and community-related activities.

Sport-related activities, both school and community sponsored, are one of the primary settings where children and adolescents receive numerous health benefits, including increased physical activity (Beets & Pitetti, 2005; Katzmarzyk & Malina, 1998; Wilde, Corbin, & Le Masurier, 2004). Given that more than 6.9 million youth participate in sports (National Federation of State High School Associations, 2004), it seems reasonable to expect that financial barriers to the participation in sports would reduce overall activity levels.

Conditional—Perform Activity Together. A total of 18 studies (27%) reported associations between parents performing activity with and the physical activity levels of children and/or adolescents. The direct involvement of mothers and fathers in activities with their children is related to increased levels of physical activity (Adkins, Sherwood, Story, & Davis, 2004; Beets et al., 2007; Heitzler et al., 2006; Hovell et al., 1996; Loucaides & Chedzoy, 2005; Morgan et al., 2003; Ornelas, Perreira, & Ayala, 2007; Prochaska, Rodgers, & Sallis, 2002; Sallis et al., 1992; Sallis et al., 1999a; Sallis,

Prochaska, Taylor, Hill, & Geraci, 1999b; Sharma, Hoelscher, Kelder, Day, & Hergenroeder, 2008; Springer, Kelder, & Hoelscher, 2006; Welk et al., 2003; Wilson & Dollman, 2007; 2009), meeting recommended physical activity levels (Nelson, Gordon-Larsen, Adair, & Popkin, 2005), and reduced sedentary behaviors (Springer et al., 2006). Having a parent physically active with his or her child is also related to more free-time physical activity (Heitzler et al., 2006). However, as children move into adolescence, the influence of parents on activity levels may be supplanted with peer activity involvement, suggesting this form of support may be influential during childhood, with younger children more likely to report someone in the family being active with them (Lown & Braunschweig, 2008). Direct parental involvement, therefore, may be more important during the early developmental years (5 to 12 years), the time that coincides with the formulation of many health-related behaviors (Institute of Medicine, 2004; A. M. Thompson et al., 2003). Preliminary results suggest that positive parental involvement during childhood contributes to adult activity behaviors (A. M. Thompson et al., 2003); however, additional longitudinal studies are necessary to confirm this observation.

Of the two parental figures, fathers are thought to overtly use their own activity behaviors to intentionally influence the activity levels of children (Davison et al., 2003). This overt behavior is supported in analyses of father–child interactions, with father–child activity characterized by more physical play-type activities (e.g., rough and tumble play; MacDonald & Parke, 1986; Paquette, 2004). However, these interactions may be limited to specific time frames and living arrangements (single- vs. two-parent households; Wright et al., 2008). The traditional role fathers play in the family, that of primary breadwinner (Christiansen & Palkovitz, 2001; Hewlett, 2003), may restrict their influence on activity to weekends in contrast to weekdays. Compared to mothers, fathers engage in greater amounts of direct involvement with their child in activities during the weekend versus weekdays (Yeung, Sandberg, Davis-Kean, & Hofferth, 2001). Recent findings indicate that for boys, fathers' direct involvement during the weekend is associated with greater overall activity levels (Beets et al., 2007). Fathers, therefore, appear to exert considerable influence on their children's activity levels, yet they may be limited in the time they have to interact with their child based on the traditional role they fulfill within the family (Yeung et al., 2001). Conversely, studies indicate that mother's "playing with you" is related to adolescent girls' activity, particularly among girls from Vietnamese backgrounds (Wilson & Dollman, 2009). Given these associations, it would appear that increasing parental involvement is a viable means by which to increase physical activity.

The amount of time mothers and fathers spend playing with their child may be different based on gender, with some studies indicating that parents report more playtime with boys (Fredricks & Eccles, 2005). Time spent active with their child may also be associated with the weight status of the child, with nonoverweight boys and girls reporting more male (i.e., father) activity involvement than their overweight peers (Zabinski, Saelens, Stein, Hayden-Wade, & Wilfley, 2003). Hence, children at risk of being overweight may require direct parental involvement to engage in sufficient amounts of activity. One study indicated that children at risk of becoming overweight—based on parental weight status—were substantially more active when parents were involved in the activity than when they participated in activity alone (Klesges et al., 1990). Thus, parental involvement may be useful in increasing the activity levels of overweight children, which is a needed area of investigation (McLean et al., 2003).

Conditional—Watching/Supervision. Six studies (9%) reported findings linking parental watching/supervision to their children's physical activity. Although their directly participating in activity with children leads to increased activity levels, parents do not necessarily have to be active to be influential. Parents who are present, but not directly participating in the activity, have children who exhibit higher activity levels (Duncan et al., 2005; Heitzler et al., 2006; Prochaska et al., 2002). This association may be because of sports involvement, where the presence of spectators is an integral part of the milieu. It seems reasonable, therefore, to expect children who are involved in sports to have higher levels of parental watching. Girls indicate their mothers' involvement is more likely to be as a spectator of their sport involvement (V. J. Thompson et al., 2003), suggesting the importance of mothers' presence. Moreover, boys indicate they would like to have a parent present at a meet/practice to provide support for their involvement (Wright et al., 2008). Youth from more socioeconomically advantaged backgrounds report greater amounts of parental watching (Duncan et al., 2005), which in turn, is related to higher levels of activity. This association may be a result of youth from a higher socioeconomic status being able to participate in sports (e.g., fewer financial barriers—see discussion above) and/or that parents of high income levels have more flexible schedules or discretionary time, which facilitates their ability to view their child's sport participation.

It appears watching is linked to activity, but it may be so as an outcome of, rather than a precursor to, activity. For instance, the presence of parents may serve as a nonverbal form of parental approval of the child's involvement, potentially increasing the likelihood of continuation. However, the presence of parents watching practices and meets may not be as important for those children already highly involved in competitive sports (Brown, 1985). Thus, watching may serve as an important supportive behavior during the initial development and acquisition of the activity behavior. The presence of a parent may also be construed as watching for the purpose of safety or supervision. Without the presence of a parent/guardian, safety concerns may prohibit younger children from accessing outdoor places to play (Beets & Foley, 2008; Sallis et al., 1997). This may be even greater for girls, with parents more likely to allow boys of the same age to play outdoors and unsupervised in comparison to girls (Soori & Bhopal, 2002). Future research examining the relationship between parental watching and activity levels among children and adolescents should help to clarify the role of watching on youth activity behaviors.

Support Type—Intangible

Intangible support consists of verbal encouragement to participate in sports or physical activities and praise for involvement and effort. Such support is believed to enhance motivation for continuing involvement (Prochaska et al., 2002), provide feedback on current performance, and contribute to greater levels of perceived competence, which have been shown to lead to higher levels of activity (Brustad, 1993). Another less studied intangible supportive behavior is the provision of information on how to perform and why (e.g., health benefits) one should be active (Duncan et al., 2005; V. J. Thompson et al., 2003). These are discussed, separately, below.

Informational—Importance of Activity and How to Be Active. Examination of the role of informational support has received the least attention in the social support literature (one study, 2%) and is one of the support mechanisms for which little information

has been gathered. Unfortunately, when information support is measured in studies (e.g., Bungum & Vincent, 1997; Dowda, Dishman, Pfeiffer, & Pate, 2007; Sallis, Taylor, Dowda, Freedson, & Pate, 2002), it has been used in conjunction with additional support items (e.g., encouragement, transportation) to create a summated scale or factor score, thereby limiting the ability to determine the unique influence information has on activity levels. Nevertheless, several important observations can be made. A qualitative study (V. J. Thompson et al., 2003) indicated that African American girls received information from their parents on the importance of maintaining a healthy weight and the benefits to overall health from physical activity. However, this informational support was not linked directly to activity levels, and therefore it provides information only on its presence and not on its impact on activity levels. Older children receive more informational support than younger children (Duncan et al., 2005), which may partly arise from the ability of older children to comprehend the more abstract processes (e.g., physiological changes) that occur with sustained activity involvement. Currently, no specific recommendations can be made regarding the influence of informational support on youth activity levels. This area deserves greater attention in future studies.

Motivational—Encouragement. Encouragement is the most extensively studied intangible supportive behavior (31 studies, 47%). Encouragement is conceptualized as motivational prompts or suggestions provided by parents to foster the involvement of their child in activity. Encouragement serves as a precursor to activity involvement, with activity occurring after its provision. Encouragement may also occur while the activity is taking place, thereby serving as a reinforcer of the behavior. Encouragement is positively related to the intensity of activity (Bauer, Nelson, Boutelle, & Neumark-Sztainer, 2008; Biddle & Goudas, 1996; De Bourdeaudhuij et al., 2005; King, Tergerson, & Wilson, 2008; Klesges, Malott, Boschee, & Weber, 1986; Springer et al., 2006); amount of activity (Anderssen & Wold, 1992; Cardon et al., 2005; Elder et al., 1998; McGuire et al., 2002; O'Loughlin, Paradis, Kishchuk, Barnett, & Renaud, 1999; Strauss, Rodzilsky, Burack, & Colin, 2001); after school activity and sports (Allender, Cowburn, & Foster, 2006; Hohepa, Scragg, Schofield, Kolt, & Schaaf, 2007); girls' attraction to sports and games (Brustad, 1996); intentions to be active (Biddle & Goudas, 1996); bone mineral density, daily physical activity, and days per week spent doing jumping activities (Sharma et al., 2008); boys' short-term change (20 months) in physical activity (Sallis et al., 1999a); perceived competence (Brustad, 1993); perceived benefits from physical activity (King et al., 2008); sport participation (Brown, 1985; Butcher, 1985; Fredricks & Eccles, 2005); and subsequent adult activity levels (A. M. Thompson et al., 2003). Given the consistent findings in the literature, encouragement stands as one of the more influential forms of intangible supportive behaviors.

According to interviews, youth would like to receive more encouragement from their parents (O'Dea, 2003; Ries, Voorhees, Gittelsohn, Roche, & Astone, 2008; Wright et al., 2008). These findings signify that while encouragement may be present, the amount perceived is insufficient to fully influence activity levels, or the means through which parents are encouraging is not fully adequate. This may be especially true for girls, as boys appear to receive more encouragement to be active from their parents than do girls (Brustad, 1993; Fredricks & Eccles, 2005; Sallis et al., 1992; J. L. Thompson et al., 2001; Timperio et al., 2008). Parents concerned about their child's weight attempt to provide more encouragement to their children to participate in activity (V. J. Thompson et al., 2003), and this increase in encouragement may account for the lack of differences between overweight and nonoverweight youth (Zabinski et al., 2003).

However, one study indicated nonoverweight children perceived greater amounts of parental encouragement than overweight children (De Bourdeaudhuij et al., 2005).

Interviews at adulthood reflecting back on their childhood parental support indicate that those who were classified as inactive or moderately active during childhood and adolescence reported receiving lower amounts of encouragement to be active (A. M. Thompson et al., 2003). This lower amount of encouragement was suggested to be the reason for their lack of activity during both childhood and adulthood. Studies indicate that the provision of encouragement is mediated through psychosocial attributes such as feelings of greater physical self-competence and liking of and attraction to activity and sports (Biddle & Goudas, 1996; Brustad, 1993; 1996), which are suggested to lead to greater rates of participation.

Importantly, if the provision of motivation, suggestions, or prompts for activity leads to increased activity levels, then designing programs that develop the "encouragement skills" of parents may prove fruitful. Parents could be taught about the what, when, and how of providing verbal prompts for their children. Another method may be to increase parental enjoyment of activity, given that parents who enjoy activity more provide greater amounts of encouragement to their child (Brustad, 1993).

Motivational—Praise. Four studies (6%) reported findings linking praise to physical activity. Praise is a motivational response provided by parents that serves to validate the child's performance and/or effort in the activity. Unlike encouragement, praise is reserved until after an activity has been performed. Thus, the presence of praise necessitates prior activity involvement of some form. Like informational support (see above), praise has usually been included within a summated scale or composite score of supportive behaviors, making it impossible to determine its unique influence on activity levels (e.g., Garcia, Pender, Antonakos, & Ronis, 1998; Trost et al., 2003a). In the few studies that have separated out the effects of praise from other support types, it does appear to be related to increased activity levels. For instance, in a rural sample of fourth- through eighth-grade students, praise was found to be one of the primary influencers of activity (Beets et al., 2006). Additional support for praise was found in a sample of California youth (Prochaska et al., 2002). However, given the insufficient amount of studies examining these relationships, care must be taken in establishing a connection. Nevertheless, the studies conducted to date indicate this may be a potentially important correlate to activity involvement and certainly one that deserves greater research attention.

Support Types—Composite Measures

As previously noted, 29 studies (44%) have examined supportive behaviors as a summated scale or composite score. Although this alleviates some of the methodological issues surrounding single-item indicators and it may minimize respondent burden, such an approach assumes the overall level of support is more important than the provision of a specific supportive behavior. Unique associations have been observed among the specific support types and activity, indicating these should be considered distinct behaviors, each resulting in its own effect on physical activity. The use of summated scales also masks some of the relationships that appear to be important for facilitating activity, and it therefore limits our understanding in developing interventions. Furthermore, although summative scales of social support do allow for the provision

of generic recommendations for parents, they lack the necessary specificity on which supportive behaviors need to be provided to increase physical activity. Moreover, single items (e.g., encouragement) used with summated responses from more than one respondent (e.g., mother and father; Hohepa et al., 2007), or in reference to "a family member" or "member of your household" (e.g., Grieser et al., 2008; Hamilton & White, 2008; Zakarian, Hovell, Hofstetter, Sallis, & Keating, 1994), or included with other referents, such as peers and teachers (e.g., Biddle & Goudas, 1996; Frenn et al., 2005; Lown & Braunschweig, 2008; Neumark-Sztainer, Story, Hannan, Tharp, & Rex, 2003), precludes the understanding of the unique role each parent takes in promoting physical activity.

Overall levels of family support appear to be related to increased activity, with parental social support attenuating the decline of physical activity of adolescent girls from eighth to twelfth grade (Dowda et al., 2007). However, the amount of variance for activity explained is generally small (e.g., Anderssen & Wold, 1992; Frenn et al., 2005; Kuo, Voorhees, Haythornthwaite, & Young, 2007; Sallis et al., 1999b; Stucky-Ropp & DiLorenzo, 1993). Nevertheless, the majority of findings indicate more active youth perceive more family support (e.g., Davison, 2004; Davison et al., 2003; Davison & Schmalz, 2006; Lewko & Ewing, 1980; Saunders, Molt, Dowda, Dishman, & Pate, 2004; Trost et al., 2003a; Ward et al., 2006; Welk et al., 2003).

The effect of parental social support on activity has been shown to be mediated through several psychosocial variables. Parental support is mediated through a child's self-efficacy and self-esteem (Ornelas et al., 2007; Trost et al., 2003a; Wu, Pender, & Yang, 2002), perceptions of competence and subjective values toward physical activity (Sharma et al., 2008), and preadolescent girls' weight bearing exercise knowledge (Ievers-Landis et al., 2003); it also influences their perceived competence and attraction to and liking of activities (Brustad, 1993; 1996), all of which are processes that are likely to increase their involvement in and satisfaction of physical activity. Supportive behaviors are also predictive of subsequent activity levels during adulthood (A. M. Thompson et al., 2003), further substantiating their importance in maintaining involvement in activity.

Many of the studies indicate the primary respondent is the mother (e.g., Adkins et al., 2004; Beets & Foley, 2008; Brustad, 1993; Stucky-Ropp & DiLorenzo, 1993). Hence, most of the information regarding parental support is derived from mothers. Mothers are more likely to provide support in the form of enrolling their children in sports/activities and attending their sporting events (i.e., logistic support), whereas fathers use their own activity behaviors more overtly to influence their children's activity (i.e., explicit support; Davison et al., 2003). Fathers are also instrumental in facilitating sport involvement for boys and girls (Greendorfer & Lewko, 1978). Because of these differences, analyses using a composite of mothers and fathers may actually suppress the unique influence of each parent (De Bourdeaudhuij et al., 2005; Greendorfer & Lewko, 1978). Thus, when examining parental support, it is necessary to separate the differential influences of mothers and fathers.

Boys report receiving more parental support than do girls (Trost et al., 2003a; Welk et al., 2003), which would coincide with the greater amounts of reported activity for boys (USDHHS, 1996). Gender differences have also been found in studies examining supporting behaviors singularly (Anderssen & Wold, 1992; Brustad, 1993; Fredricks & Eccles, 2005); however, this observation is not always consistent. Several studies suggest that boys report less support for activity (Higgins, Gaul, Gibbons, & Van Gyn, 2003; Wu, Pender, & Noureddine, 2003). When grouped by activity levels, low active

boys and girls report similar amounts of support (Lewko & Ewing, 1980), with one study observing no differences at all (Garcia et al., 1995).

Whether parents provide differential support to their child based on weight status or ethnic background is currently unclear. Several studies indicate that overweight and nonoverweight youth perceive similar amounts of overall support (Trost, Sirad, Dowda, Pfeiffer, & Pate, 2003b; Ward et al., 2006) and encouragement, praise, transportation, and participating in activity with their parents (Beets et al., 2006), although several studies suggest some disparity in support provision, with overweight youth reporting less support (De Bourdeaudhuij et al., 2005; Zabinski et al., 2003) and lower amounts of parental watching (Beets et al., 2006).

Several studies indicate differences in family social support among various ethnic groups with some reporting White non-Hispanics having higher amounts (Grieser et al., 2008; Wilson & Dollman, 2007; 2009), whereas others report African American and rural girls perceive more than their White non-Hispanic peers (Felton et al., 2002). What is unclear is whether these differences exist because of actual cultural variations in parent–child interactions or parenting styles (Arredondo et al., 2006). Finally, in terms of religion, the only study to date examining parental social support in relation to levels of religiosity found higher levels of perceived support for adolescents from less religious families (Kahan, 2005), suggesting religion may play a role in determining parental supportive behaviors.

Methodological Issues

Apart from the inconsistencies as to what social support specifically entails, several methodological concerns have been raised regarding the measurement of physical activity and questionnaire specification of activity when examining social support. Physical activity is a complex behavior and no one method of assessing it is considered ideal. This uncertainty in measurement is especially true when measuring the activity levels of children (Welk, Corbin, & Dale, 2000). The variations in whether or not social support is related to youth activity levels is suggested to be a function of the activity measure employed (Prochaska et al., 2002). In studies using both objective and self-report activity, analyses show that objective monitoring (e.g., accelerometers, observation) either reveals no relationship with social support (Adkins et al., 2004; Klesges et al., 1990; Morgan et al., 2003; Prochaska et al., 2002; Sallis et al., 2002) or the relationship is considerably weaker in comparison to self-reported activity (Prochaska et al., 2002). Great care, therefore, must be taken when examining the relationships between social support and physical activity. To date, relatively few studies have used multiple methods, and thus considerable work is still required in this area.

Additional concerns in this body of research relate to the wording and assessment of physical activity in the available questionnaires. Typically, social support questionnaires use a generic reference to physical activity by including sports and physical activity together. These domains of activity are conceptually unique (Caspersen, Powell, & Christensen, 1985) and are likely to require different types of support to facilitate participation (Heitzler et al., 2006). Consequently, supportive behaviors necessary for enhancing participation in certain types of activities are relatively unexplored.

Only a single article reported information related to social interactions as a negative construct (DiLorenzo, Stucky-Ropp, Vander Wal, & Gotham, 1998). The two items asked about the family criticizing exercise and complaining about time spent in exercise.

The negative family support was inversely related to boys' physical activity solely. Apart from this, no other attempts have been made to develop measures for negative parental social supportive behaviors for children's physical activity. In qualitative analyses, children, adolescents, and adults perceive some aspects of social support to hinder their participation in physical activities (A. M. Thompson et al., 2003; Wright et al., 2008). Investigations of social support among older adults (Chogahara, 1999) and individuals with traumatic brain injuries (Driver, 2007) indicate distinct positive and negative domains of perceived social support. Such findings bring into question whether similar polarities may be present with parental provisions of social support. However, attention needs to be paid as to whether the negative aspects of parental social support are unique constructs (e.g., inhibiting behaviors) or simply the flip side of the coin of items already developed (e.g., child unable to participate because activities are too expensive). If polarities do exist, studies can help us understand how these behaviors can be modified to prevent physical inactivity.

IMPLICATIONS FOR PRACTICE

Despite wide ranges in the type of support examined, sample characteristics, measures of physical activity, and analytical approaches, current evidence indicates that parental supportive behaviors are an important facilitator of the physical activity–related behaviors of youth. The following recommendations are offered as a guiding framework for frontline practitioners working with families. Initially, an inventory of the social supportive behaviors parents and/or guardians currently provide should be assessed. This will direct attention toward areas where parents and/or guardians should place additional effort for the promotion of physical activity. Thus, the supportive behaviors identified in the review can serve as a listing of potential behaviors parents and/or guardians can use to facilitate physical activity of their children. Importantly, because mothers and fathers influence their child's physical activity levels differently, practitioners should use different approaches when providing male and female parents and/or guardians ideas about how they might be physically active with or promote the physical activity of their child.

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