



Family Exercise Modelling and Independent Physical Activity Choices among Adolescents

Dr. Amelia Rose Whitfield

Senior Research Fellow in Developmental Social Psychology and Physical Activity
Department of Adolescent Development and Behavioral Health
Westbridge Institute for Developmental Research
Bristol, United Kingdom

Article Type: Evidence-Informed Conceptual Research Article

Submitted: 08-October-2024

Revised: 08-November-2024

Accepted: 09-December-2024

Published: 16-December-2024

Abstract: Adolescence is a developmental period in which physical-activity habits become increasingly shaped by personal interests, peer relationships, family practices, and growing independence. Parents remain influential, although their role changes as adolescents gain greater autonomy in deciding how, when, and with whom they engage in physical activity. This paper examines the relationship between family exercise modelling and adolescents' independent physical-activity choices from a developmental social psychology perspective. The conceptual framework integrates social learning theory, social cognitive theory, self-determination theory, family systems perspectives, and research on parental support, modelling, autonomy, and adolescent physical activity. Parents may influence activity through their own behaviour, encouragement, transportation, shared participation, emotional support, and access to opportunities. Existing evidence indicates that parental modelling has a small positive association with youth physical activity, while parental support generally shows a stronger relationship. Meta-analytic and longitudinal research also suggests that supportive parental involvement and shared activity may contribute to sustained participation, whereas highly controlling behaviour may be less beneficial. The framework distinguishes behavioural modelling from parental support, monitoring, pressure, and control. It proposes that modelling may influence independent activity choices through observational learning, perceived competence, internalization of physical-activity values, and access to suitable opportunities. However, adolescents increasingly evaluate whether parental behaviour is compatible with their own interests, identity, goals, and social environment. The manuscript does not introduce fabricated participant data; quantitative findings are drawn from published evidence. Overall, the paper argues that family-based physical-activity promotion should

emphasize credible parental modelling, supportive involvement, autonomy support, and opportunities for adolescents to make personally meaningful and increasingly independent physical-activity choices.

Keywords: Family Exercise Modelling; Adolescents; Physical Activity; Parental Influence; Social Learning; Developmental Psychology; Parental Support; Adolescent Autonomy; Exercise Behaviour; Family Environment;

1. Introduction

Background

Physical activity during adolescence develops through an interaction between personal growth and the social environment. As adolescents mature, they gain greater freedom to make their own decisions, develop personal preferences, manage daily routines, and participate in activities without constant parental supervision. Even with this growing independence, the family continues to shape how health-related behaviours are observed, discussed, supported, and understood. This makes adolescence an especially important period for examining how parents' own exercise behaviour relates to young people's developing physical activity choices.

Family influence extends beyond direct instructions to exercise. Parents may demonstrate active lifestyles through their own routines, exercise with their children, provide transportation, pay for activities or equipment, encourage participation, praise effort, and communicate the importance of physical activity. Research on the family environment during adolescence has identified parental support, encouragement, behavioural modelling, and access to resources as important ways through which families may support or limit physical activity.

Parental modelling is important because adolescents learn partly by observing people around them. When parents participate regularly in physical activity, young people may begin to see exercise as a normal part of everyday life rather than an unusual or occasional behaviour. Such observations may shape beliefs about whether physical activity is useful, realistic, enjoyable, and socially acceptable.

Observation, though, does not automatically lead to imitation. Adolescents interpret parental behaviour through their own interests, motivation, relationships, and developmental needs.

Research supports a relationship between parental modelling and youth physical activity, but the relationship appears modest and varies across studies. Yao and Rhodes reviewed 115 studies and found a small association between parental modelling and youth physical activity. Parental support showed a stronger association. This difference is important because it suggests that parents' own activity behaviour alone may not strongly determine adolescent activity. The way parents encourage, facilitate, and support participation also matters.

Developmental changes make this relationship more complex. Younger children often depend heavily on parents for transportation, scheduling, access, and participation opportunities. Adolescents increasingly make activity choices based on personal interests, friendships, and other social influences. Parents may provide access to sport or exercise, but adolescents gain more control over whether they continue once alternative activities and social options become available.

This raises an important developmental question. Does parental exercise modelling continue to matter when adolescents begin making their own physical activity decisions?

The relationship is unlikely to be simple. Parental modelling may influence adolescents indirectly by shaping attitudes, perceived competence, values, expectations, and behavioural habits that later guide independent decisions.

Longitudinal research supports this interpretation. One prospective study found that parental support was positively associated with moderate-to-vigorous physical activity, while parental control showed a negative association. Support and co-participation around age 12 were also linked with physical activity five years later. These findings suggest that family influence may extend beyond immediate participation and contribute to longer-term behaviour.

Another important distinction is between influence and control. Adolescents may respond positively when parents model active behaviour, provide encouragement, and still allow personal choice. Excessive pressure, in contrast, may weaken autonomous motivation.

A 2022 meta-analysis found that positive parental influence was significantly associated with higher physical activity among children and adolescents, whereas punishment and discouragement were not significant predictors. This strengthens the argument that the quality of parental involvement matters more than involvement alone.

The present study therefore treats family exercise modelling as one part of a broader developmental system. Parents may provide visible behavioural examples, but adolescents decide how those examples fit within their own developing autonomy. Independent physical

activity choices are more likely to emerge when family behaviour becomes personally meaningful rather than externally imposed.

Problem Statement

The central problem is that research on family influence and youth physical activity often combines different forms of parental involvement into broad measures of support. Modelling, encouragement, transportation, co-participation, supervision, financial assistance, and behavioural control represent different psychological processes. Treating them as one general construct makes it difficult to understand the specific role of parents' own exercise behaviour. A second problem concerns developmental change. Parental influence does not remain constant from childhood through adolescence. As young people become more independent, direct parental regulation may become less effective, while internalized values and previously observed behaviour may continue to influence decisions. Research therefore needs to distinguish between immediate parental influence and influence on later independent behaviour.

A third problem is the difference between participation and choice. An adolescent may participate in a sport because a parent requires attendance. This does not necessarily mean that the adolescent has personally accepted physical activity as meaningful or valuable. Independent choice involves a greater degree of self-directed decision-making.

A fourth problem concerns inconsistent parental signals. Parents may verbally encourage exercise while following largely sedentary routines themselves. In other cases, parents may model regular physical activity without directly encouraging their children. Behavioural examples and verbal messages may therefore communicate different expectations.

A fifth problem is the possibility of overstating parental influence. Adolescents increasingly interact with peers, schools, sports organizations, online communities, and wider social environments. These settings provide alternative behavioural models that may strengthen, weaken, or replace family influence.

The central research problem can therefore be stated as:

How does parental exercise modelling contribute to adolescents' development of independent physical activity choices, and under what developmental and social conditions does family modelling become internally accepted rather than externally imposed?

Research Motivation

The first motivation for this research is the importance of adolescence as a transition toward behavioural independence. During this period, young people increasingly make their own decisions about leisure, sport, recreation, and daily movement. Understanding how family experiences contribute to these decisions may strengthen explanations of physical activity development.

The second motivation comes from evidence showing that parental support is consistently related to youth physical activity. Research on parental social support has identified instrumental, motivational, informational, and other forms of support, with many studies reporting positive associations between selected forms of support and youth activity.

The third motivation is the need to distinguish supportive involvement from controlling behaviour. Longitudinal evidence suggests that parental support may predict later activity, while parental control may have the opposite relationship. This difference is particularly important during adolescence because autonomy becomes increasingly important.

The fourth motivation is methodological. Previous reviews have shown that findings differ according to how physical activity is measured. One meta-analysis found a stronger association between parental support and youth physical activity when activity was self-reported than when measured objectively. This demonstrates the importance of combining subjective and objective measures in future research.

The fifth motivation is practical. Family-based interventions may be more effective when parents are encouraged to model healthy behaviour, provide support, and create opportunities rather than simply instructing adolescents to exercise. Existing intervention research shows promise, but differences in intervention design and outcome measurement make broad conclusions difficult.

2. Literature Review

Family Behaviour as a Developmental Context

The family is one of the earliest and most persistent social environments in which young people observe physical activity. Parents influence transportation, scheduling, access to activities, financial resources, encouragement, and opportunities for shared participation. These factors may shape adolescents' experiences long before they begin making fully independent activity decisions.

Research has emphasized the importance of family support, parental modelling, and resources within the home. The family therefore functions both as a practical environment for activity and as a setting for social learning.

Parental modelling differs from direct encouragement because the message is communicated through behaviour. When adolescents regularly see a parent walking, cycling, swimming, exercising, or participating in sport, they receive repeated examples of physical activity as a normal adult behaviour.

Such exposure may contribute to behavioural expectations, but modelling should not be treated as automatic imitation. Adolescents may observe parental behaviour without adopting it themselves.

Whether modelling becomes meaningful may depend on the quality of the parent-adolescent relationship, perceived similarity, personal interests, and whether the activity appears enjoyable, realistic, or burdensome.

Yao and Rhodes' meta-analysis illustrates this distinction clearly. Across 115 studies, parental modelling showed a small association with youth physical activity, while parental support showed a moderate association. The findings suggest that modelling matters, but it represents only one part of family influence.

Parental Modelling and Social Learning

Social learning theory provides a useful explanation for how adolescents may learn behavioural patterns from parents. People often learn by observing models who are socially meaningful and by noticing the outcomes associated with their behaviour.

In the context of exercise, parental modelling communicates more than movement itself. It may communicate attitudes toward effort, persistence, health, leisure, and recreation.

When adolescents observe parents treating physical activity as an ordinary and enjoyable part of life rather than as punishment or obligation, they may develop more positive expectations toward activity.

Modelling may also influence self-efficacy. Adolescents who observe parents successfully engaging in accessible physical activities may view similar behaviours as achievable.

Perceived similarity may be especially important. A behavioural example that feels realistic and attainable may have greater personal relevance than one that appears highly specialized or distant from the adolescent's own abilities and interests.

Research examining descriptive norms, self-efficacy, and perceived similarity supports the importance of these processes in behavioural influence.

Parental modelling may therefore be more meaningful when adolescents see the observed behaviour as realistic, relevant, and compatible with their own circumstances.

Parental Support and Physical Activity

Parental support includes several different behaviours.

These may include transportation, paying fees, purchasing equipment, participating in activities, watching events, providing encouragement, praising effort, and discussing the benefits of physical activity.

These forms of support influence behaviour through different pathways.

Transportation reduces practical barriers.

Encouragement may strengthen motivation.

Co-participation provides companionship.

Financial assistance improves access to opportunities.

A 2015 meta-analysis found a moderate association between parental support and youth physical activity, with a random-effects correlation of $r = .38$. This association was stronger than the relationship found for parental modelling.

This does not necessarily mean that support has a stronger causal effect. The relationship may work in both directions. Parents may provide greater support because an adolescent is already active, while active adolescents may request transportation, equipment, or other assistance.

Longitudinal research provides stronger insight into how these relationships develop over time. Evidence from the MATCH cohort found that parental support and co-participation during early adolescence were associated with physical activity several years later.

These findings suggest that family experiences may contribute to longer-term physical activity patterns.

Autonomy and Independent Choice

Adolescence involves increasing psychological autonomy. Young people gradually become more capable of regulating behaviour according to values and preferences they personally accept rather than simply following parental expectations.

Self-determination theory distinguishes between autonomous and controlled forms of motivation. Behaviour is more likely to continue when individuals experience choice, competence, and meaningful social connection.

This distinction is especially relevant to family exercise modelling.

Parents may provide opportunities, encouragement, and behavioural examples without deciding exactly which activities adolescents should choose.

Supportive involvement may therefore create a bridge between family influence and independent choice.

Excessive control may produce a different response. When adolescents feel that physical activity is imposed, they may develop less ownership over the behaviour.

Longitudinal evidence has identified parental control as a negative predictor of moderate-to-vigorous physical activity.

Meta-analytic evidence also suggests that positive parental influence is associated with activity, while punishment and discouragement show weaker or non-significant relationships.

The developmental implication is that effective family influence may gradually shift from direct regulation toward autonomy-supportive involvement.

Parent-Adolescent Co-Participation

Co-participation combines behavioural modelling with social support.

When parents and adolescents take part in physical activity together, young people observe active behaviour while also experiencing companionship and direct interpersonal involvement.

Co-participation may reduce practical barriers as well. Families may share transportation, schedules, equipment, and recreational spaces.

Longitudinal research suggests that parent-child co-participation during early adolescence may be associated with physical activity later in development.

Co-participation, though, should not automatically be viewed as beneficial in every situation.

Adolescents may increasingly prefer activities with peers or activities they have selected independently. Excessive parental involvement may conflict with the desire for autonomy.

The value of shared activity may therefore depend on whether adolescents experience it as enjoyable and voluntary rather than compulsory.

Parent-Child Physical Activity Concordance

Research has also examined whether parents' own physical activity levels correspond with those of their children.

Petersen and colleagues reviewed 39 studies that included objectively measured child physical activity and at least one measure of parental activity.

The review found evidence of parent-child activity associations, but the strength of these relationships differed according to developmental stage, sex, measurement method, and type of activity.

This variation is important because it shows that family modelling does not operate through a simple one-to-one transfer of behaviour.

Other systematic research focusing on children has also identified associations between parental and child physical activity and highlighted the possible role of parental behaviour as implicit or explicit modelling.

Direct behavioural correspondence may weaken during adolescence as young people become involved in additional social environments.

Peers, schools, sports organizations, and other communities may become more influential, while parents exercise less direct control over leisure time.

Parent-child activity similarity may therefore serve as an early developmental pathway that contributes to later internalization rather than creating lifelong behavioural dependence.

Family Influence Across Development

Parental influence changes as children mature.

During childhood, parents often control access, transport, schedules, and opportunities.

During adolescence, their role increasingly shifts toward providing examples, support, resources, and social reference points.

Previous review evidence suggests that parental influence is more clearly established among children than adolescents, although parents' activity levels, attitudes, transportation, and encouragement remain relevant during adolescence.

This developmental difference is central to the present paper.

If adolescents are becoming increasingly independent, the goal of family influence should not be continued behavioural control.

Parents may instead support the development of internal reasons for remaining physically active.

The family may therefore function as a developmental scaffold. It provides resources, opportunities, and behavioural examples earlier in development while gradually allowing adolescents greater responsibility for their own activity decisions.

Family-Based Physical Activity Interventions

Family-based physical activity interventions attempt to draw on parental influence to support activity among children and adolescents.

These interventions use a range of approaches, including parent education, shared family activities, telephone support, organized programs, and educational materials.

A systematic review of parent-engagement interventions identified 35 eligible studies from 1,227 records. Considerable variation in study design, intervention quality, and outcome measurement limited the strength of the overall conclusions.

More recent research on school-based family-oriented interventions identified 22 studies. Ten reported improvements in physical activity, six reported improvements in sedentary behaviour, and nine reported improvements in physical fitness or related healthy behaviours. These findings suggest that family involvement has value, but they do not show that every form of parental involvement produces the same outcome.

The effectiveness of family-based approaches is likely to depend on how parents participate, whether adolescents experience the involvement as supportive, and whether the intervention allows young people to develop their own reasons for remaining active.

3. Research Gap

The literature shows that parental behaviour, support, and the wider family environment are linked with physical activity among young people. Even so, several important questions remain unresolved.

First, many studies combine parental modelling with broader forms of parental support. This makes it difficult to determine whether adolescents respond specifically to their parents' exercise behaviour or to the encouragement, resources, and opportunities that often accompany it.

Second, much of the existing research focuses on physical-activity participation rather than independent physical-activity choice. An adolescent who attends an activity because of parental transportation, encouragement, or scheduling is not necessarily showing autonomous adoption of the behaviour.

Third, the developmental shift from parental influence toward greater adolescent independence is not fully represented in many family-based physical-activity models.

Fourth, research does not always separate supportive involvement from parental control. Existing evidence suggests that these forms of influence may operate differently and may even have opposing relationships with adolescent physical activity.

Fifth, peer influence becomes increasingly important during adolescence. More research is needed to understand when parental modelling continues to matter as peer relationships and other social environments become more influential.

Sixth, measurement differences remain a major issue. Studies using objective measures of physical activity may produce different estimates from studies relying on self-report, which makes direct comparison across studies more difficult.

Seventh, longitudinal evidence is still less extensive than cross-sectional research. As a result, the process through which parental modelling becomes internalized and later expressed as independent behaviour requires further study.

The principal gap can be summarized as:

Existing research demonstrates that parental modelling and support are associated with adolescent physical activity, but insufficient attention has been given to the developmental process through which observed family behaviour becomes an adolescent's independently chosen physical-activity behaviour.

4. Novelty / Proposed Contribution

The paper proposes a Family Modelling-to-Autonomous Activity Pathway:

Parental Exercise Modelling → Observational Learning → Perceived Competence and Outcome Expectations → Internalization of Activity Value → Autonomous Motivation → Independent Physical Activity Choice

This pathway is influenced by:

Parental Support + Autonomy Support + Parent–Adolescent Relationship + Peer Context + Opportunity Structure

The framework separates modelling from support. Modelling provides behavioural examples and information, while support provides encouragement, access, and practical opportunities.

It also separates support from control. Supportive involvement is expected to strengthen autonomy, while excessive control may interfere with the internalization of physical activity values.

The framework further proposes that parental influence changes as adolescents become more independent. Over time, parental modelling may operate less as a direct behavioural influence

and more through internal processes such as perceived competence, personal values, and autonomous motivation.

The proposed contribution is therefore developmental rather than simply correlational. It explains how family behaviour may contribute to independent physical activity without assuming that adolescents simply copy what their parents do.

5. Research Objectives / Research Questions

The primary objective is to examine how family exercise modelling may contribute to adolescents' independent physical activity choices.

The secondary objective is to distinguish behavioural modelling from parental support, control, and co-participation and to examine how these processes interact with adolescent autonomy.

Research Objectives

- To examine the relationship between parental exercise modelling and adolescent physical activity behaviour.
- To distinguish parental modelling from broader forms of parental social support.
- To examine how adolescents' perceived competence may mediate the relationship between family modelling and independent activity.
- To examine the role of autonomy in transforming parental influence into personally endorsed physical-activity choices.
- To examine the developmental role of parent–adolescent co-participation.
- To distinguish supportive parental involvement from controlling parental behaviour.
- To examine how peer context may strengthen or weaken family influence.
- To develop a developmental framework explaining the transition from family-supported activity to independently selected physical activity.

Research Questions

1. How is parental exercise modelling related to adolescents' physical activity?
2. Does parental support have a stronger behavioural influence than modelling alone?
3. How does perceived competence contribute to the relationship between parental modelling and activity?
4. Does autonomy influence whether parental behaviour becomes internally accepted?
5. How does parent–adolescent co-participation affect independent activity choices?

6. Does parental control weaken autonomous physical-activity motivation?
7. How does peer influence interact with family exercise modelling?
8. Does family modelling remain influential as adolescents become more independent?
9. Which forms of parental involvement are most compatible with autonomous physical-activity choices?

6. Methodology

Research Design

This manuscript adopts an evidence-informed developmental social psychology research design. The analysis brings together findings from systematic reviews, meta-analyses, longitudinal studies, and theoretical research on parental modelling, parental support, family physical activity, autonomy, and adolescent behaviour.

The manuscript does not present a newly collected dataset involving adolescent participants. Quantitative findings reported later are drawn from published research and should not be interpreted as original empirical results.

The methodological emphasis is therefore on integrating existing evidence. Particular attention is given to studies that separate parental behaviour from parental support and to research using longitudinal designs or objective measures of physical activity.

Dataset / Sample

No original participant dataset was generated for this manuscript.

The main quantitative evidence includes Yao and Rhodes' meta-analysis of 115 studies examining parental correlates of physical activity among children and adolescents.

A later meta-analysis by Su and colleagues included 112 eligible studies and 741 effect sizes examining positive and negative forms of parental social influence in relation to physical activity.

Petersen et al.'s systematic review included 39 studies involving parent-child dyads, with sample sizes ranging from 15 to 1,267 dyads. The review focused on objectively measured child physical activity together with measures of parental physical activity.

The MATCH longitudinal analysis included 374 participants assessed across different stages of adolescence and examined parental support and control in relation to moderate-to-vigorous physical activity.

These studies are treated as separate sources of evidence. Their data are not combined into a new statistical dataset.

Tools / Techniques

The conceptual analysis distinguishes six main constructs: parental exercise modelling, parental support, parental control, co-participation, adolescent autonomy, and independent physical activity choice.

Parental modelling refers to adolescents observing their parents' physical-activity behaviour.

Parental support refers to behaviours that encourage or facilitate physical activity, including transportation, praise, encouragement, information, and shared participation.

Parental control refers to attempts to regulate physical activity through pressure, restriction, or coercive expectations.

Adolescent autonomy refers to the extent to which young people experience their activity choices as personally chosen and self-endorsed.

Independent physical activity choice refers to participation selected by the adolescent without direct parental compulsion.

For future empirical research, suitable measurement approaches include accelerometry, objective activity monitoring, activity diaries, and validated questionnaires.

Experimental Procedure

No new experimental procedure was conducted for this manuscript.

A future longitudinal study could begin during early adolescence and assess parental activity behaviour, parental support, parental control, family co-participation, adolescent autonomy, self-efficacy, and physical activity.

Parents and adolescents should ideally complete separate assessments to reduce bias associated with relying on a single source of information.

Objective activity monitoring should also be repeated across several measurement periods. This would allow researchers to examine whether parental modelling predicts later adolescent activity after accounting for baseline activity levels.

Peer activity and peer support should also be measured because family influence may change as adolescents gain greater social independence.

Repeated assessments would help determine whether parental influence weakens over time, remains stable, or continues indirectly through internalized motivation and perceived competence.

Evaluation Metrics

The primary outcome should be objectively measured moderate-to-vigorous physical activity. Secondary outcomes should include total physical activity, sedentary time, activity frequency, organized sport participation, recreational activity, and self-directed physical activity choices.

Psychological measures should include perceived competence, autonomous motivation, controlled motivation, perceived parental support, perceived parental control, and family identification.

Parental modelling should be assessed through both parent-reported physical activity and adolescents' perceptions of parental activity.

Future studies should also examine longitudinal relationships between early family factors and later adolescent activity.

Multilevel regression models would be suitable for repeated observations across time.

Structural equation modelling could test the proposed pathway from parental modelling to perceived competence, autonomous motivation, and independent physical activity choice.

Cross-lagged models would be especially useful for examining whether parent and adolescent activity influence each other over time.

7. Results

Table 1. Published Meta-Analytic Evidence on Parental Influence and Youth Physical Activity

Parental Influence	Published Estimate	Interpretation
Parental modelling	$r = .16$	Small positive association
Parental support	$r = .38$	Moderate positive association
Positive parental influence	$r = .202$	Significant positive association
Parental control	$\beta = -.18$	Negative longitudinal predictor in MATCH

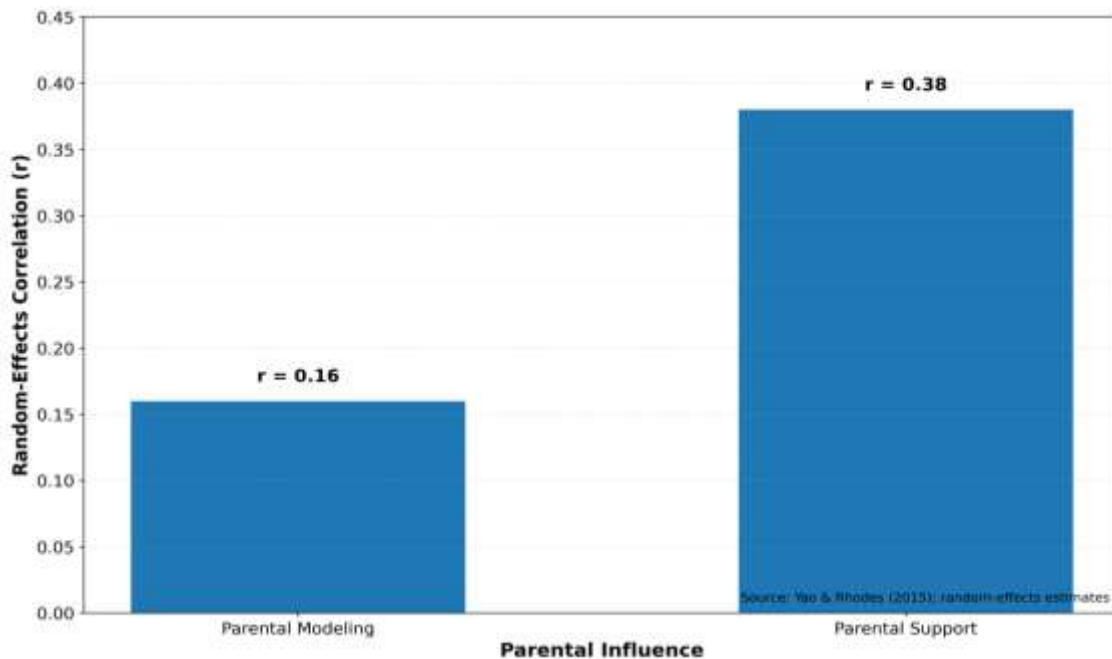
Sources: Yao and Rhodes; Su et al.; MATCH longitudinal study.

The estimates show that different forms of parental influence are related to youth physical activity in different ways. Parental modelling shows a small positive association, while parental support shows a stronger positive relationship. Positive parental influence is also

associated with higher physical activity, whereas parental control shows a negative longitudinal relationship in the MATCH study.

These values come from different published studies and should not be interpreted as a single pooled statistical model. Differences in study design, sample characteristics, measurement methods, and statistical approaches should also be considered when comparing the estimates.

Graph 1. Meta-Analytic Associations Between Parental Influences and Youth Physical Activity



The graph compares the random-effects correlations reported by Yao and Rhodes for parental modelling and parental support. Parental support shows a stronger association with youth physical activity than parental modelling.

This difference suggests that adolescents may respond not only to parents' own exercise behaviour but also to the encouragement, practical assistance, and interpersonal support surrounding physical activity.

Table 2. Published Evidence Concerning Social Support and Adolescent Physical Activity

Social Influence	Mean Weighted Correlation
Social support	$r = .298$
Family support	$r = .226$
Peer support	$r = .256$
School support	$r = .142$

Source: 2023 meta-analysis of 56 studies, 65 independent samples, and 47,196 participants.

The published estimates show positive associations between each form of social support and adolescent physical activity.

Overall social support shows the strongest association at $r = .298$. Peer support follows at $r = .256$, while family support shows an association of $r = .226$. School support has the smallest reported association at $r = .142$.

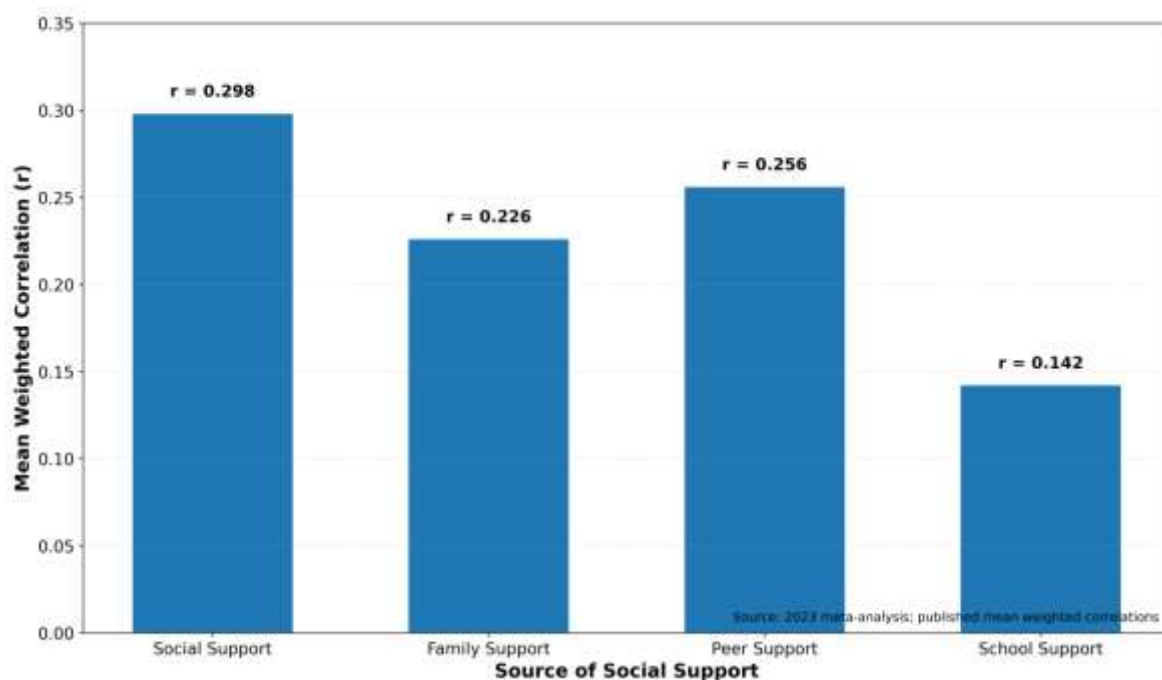
These findings suggest that adolescent physical activity develops within several social contexts. Family support remains relevant, but peer and school environments also contribute to adolescents' activity experiences as their social independence increases.

The values should be interpreted as separate meta-analytic associations rather than direct measures of causal influence.

Graph 2. Meta-Analytic Associations Between Social Support and Adolescent Physical Activity

The graph provides a visual comparison of the four published correlations. Overall social support shows the largest association, followed by peer support, family support, and school support.

This pattern supports a broader developmental interpretation in which adolescents' physical activity is influenced by several social relationships rather than by family behaviour alone.



The graph shows that family support has a positive association with adolescent physical activity, although it is not the strongest association among the social-support categories. The

strength of the family-support relationship also appears to vary according to factors such as gender and socioeconomic characteristics.

Statistical / Experimental Findings

Published evidence consistently supports a relationship between parental influence and youth physical activity, but the strength of this relationship differs depending on the type of parental behaviour being examined.

Yao and Rhodes reported a random-effects correlation of $r = .16$ for parental modelling, indicating a small positive association with youth physical activity. By comparison, parental support showed a stronger random-effects correlation of $r = .38$.

This difference is theoretically important. It suggests that adolescents may benefit from observing active parents, but practical and emotional support may provide additional pathways through which physical activity becomes easier to access and maintain.

Su et al. provided further evidence through a later meta-analysis. Their findings showed a positive association between positive parental influence and youth physical activity, with a corrected correlation of $r = .202$. The analysis included 112 eligible studies and 741 effect sizes, providing a broad evidence base for understanding parental influence.

The longitudinal MATCH study also identified important differences among parental behaviours. Overall parental support was positively associated with moderate-to-vigorous physical activity. Tangible support, encouragement, and transportation also showed positive relationships, while parental control was negatively associated with moderate-to-vigorous physical activity.

Early parental support and co-participation were also associated with physical activity five years later. This finding suggests that family influence may contribute to longer-term developmental patterns rather than affecting activity only when support is immediately available.

Evidence concerning actual parent-child activity patterns provides additional support. Petersen et al. reviewed 39 studies involving parent-child dyads and identified associations between objectively measured child physical activity and parental activity. The strength of these relationships varied across developmental groups and research methods.

A 2023 meta-analysis of social support also reported positive associations with adolescent physical activity. Family support showed a mean weighted correlation of $r = .226$.

Taken together, these findings support a developmental interpretation in which parental modelling represents one part of a broader family influence system.

8. Discussion / Critical Discussion

Results Interpretation

The findings indicate that family exercise modelling is related to youth physical activity, but modelling alone does not appear to represent the strongest form of family influence.

The relatively small association for parental modelling suggests that seeing parents engage in physical activity may contribute to adolescent behaviour, but this relationship alone does not fully explain activity patterns.

Parental support shows a stronger relationship.

This suggests that behavioural examples may become more meaningful when they are accompanied by transportation, encouragement, co-participation, access to resources, and positive communication.

This distinction is especially important during adolescence.

A parent may exercise regularly, yet the adolescent still needs opportunities to choose activities that fit personal interests, friendships, school schedules, and developing preferences.

The findings also support the idea that family influence gradually shifts from direct regulation toward developmental support.

Parents may have greater long-term influence when they model active behaviour, provide suitable opportunities, and still allow adolescents to make their own decisions.

The negative relationship between parental control and moderate-to-vigorous physical activity in the MATCH study supports this interpretation.

Excessive control may produce short-term compliance without encouraging adolescents to personally value the behaviour. This makes controlling approaches less suitable for supporting independent and lasting physical activity.

Comparison with Previous Studies

The present interpretation is consistent with Yao and Rhodes' meta-analysis, which found a small association between parental modelling and youth physical activity and a stronger association for parental support.

It also aligns with research by Beets et al., which identified several forms of parental support and reported generally positive relationships with youth activity.

Earlier systematic review evidence also suggests that parental influence becomes less direct during adolescence than during childhood, although parental activity, encouragement, transportation, and attitudes continue to matter.

Longitudinal findings add further support to this developmental interpretation because parental support and co-participation during early adolescence were associated with later physical activity.

Research on parent-child activity patterns also supports the relevance of parents' own behaviour while showing considerable variation across studies.

The later meta-analysis by Su et al. provides additional evidence that positive parental influence is associated with higher youth physical activity.

Overall, the proposed framework brings these findings together by explaining how parental behaviour may gradually contribute to adolescent self-directed activity rather than producing simple behavioural imitation.

Differences across studies may occur because parental influence includes several distinct behaviours.

A parent who exercises regularly provides a behavioural model. A parent who also offers encouragement, transportation, equipment, and access provides practical support that may have a more immediate effect on participation.

Measurement method is another important source of variation.

Research has shown differences between objectively measured physical activity and self-reported activity. Self-report may reflect memory, interpretation, or perceived expectations, while objective measures provide direct information about movement.

Developmental stage also matters.

Younger adolescents may depend more on parents for transportation, access, and scheduling. Older adolescents usually have more freedom to select activities independently and may rely more strongly on peers.

Gender and socioeconomic characteristics may also shape the relationship between family support and physical activity.

The type of activity may produce different patterns as well.

Parental modelling may have greater relevance for accessible activities that families can perform together. Its influence may be weaker for specialized sports or activities that adolescents mainly experience through peers, schools, or organized clubs.

The quality of the parent-adolescent relationship may also influence how modelling is interpreted.

Adolescents may respond more positively when they view their parents as supportive, trustworthy, and credible behavioural examples.

Parental modelling may also operate indirectly.

Parents may shape values, expectations, competence, and attitudes without producing an immediate change in physical activity. These indirect effects may become clearer across longer periods of development.

9. Research Contribution / Implications

The primary contribution of this paper is the clear separation of family exercise modelling from broader forms of parental influence.

Parents may influence adolescent activity through their own behaviour, but they also influence participation through encouragement, access, communication, transportation, and co-participation.

These mechanisms should not be treated as identical.

The second contribution is developmental.

The paper proposes that family influence changes as adolescents gain greater behavioural autonomy. Parents may initially provide direct access and structure, but over time they increasingly serve as behavioural models, supportive resources, and social reference points.

The third contribution is motivational.

Evidence concerning parental control suggests that family-based physical-activity promotion should avoid excessive pressure. The aim should be to help adolescents internalize physical activity as personally meaningful rather than keeping behaviour dependent on external regulation.

The fourth contribution is methodological.

Future research should combine adolescent reports, parent reports, objective activity measures, and longitudinal designs. This would help separate observed parental behaviour from adolescents' perceptions of support and control.

The fifth contribution concerns intervention design.

Family-based programs should move beyond telling parents to instruct adolescents to exercise. Greater emphasis should be placed on modelling active behaviour, creating realistic opportunities, communicating support, and respecting adolescents' developing independence.

Practical Implications

- **Behavioural modelling:** Parents should demonstrate regular physical activity as a normal part of everyday life rather than presenting exercise only as a health requirement.
- **Autonomy support:** Adolescents should have opportunities to choose activities that match their own interests and preferences.
- **Positive encouragement:** Supportive feedback and encouragement may strengthen participation without creating unnecessary pressure.
- **Co-participation:** Shared physical activity may provide both social connection and behavioural modelling when adolescents experience participation as voluntary.
- **Practical facilitation:** Transportation, equipment, scheduling assistance, and access to suitable activities may reduce practical barriers.
- **Avoidance of excessive control:** Coercive strategies should be avoided because they may conflict with adolescents' developing autonomy.
- **Family consistency:** Verbal messages about the importance of physical activity should align with parents' own visible behaviour.
- **Peer integration:** Family-based activity should exist alongside adolescents' peer relationships rather than attempting to replace them.
- **Developmental adaptation:** Parental involvement should become increasingly autonomy-supportive as adolescents mature.
- **Long-term orientation:** The aim should be the development of independent physical-activity habits rather than temporary compliance with parental expectations.

10. Conclusion

Family exercise modelling is an important part of adolescent physical-activity development, but it does not operate in isolation.

Parents provide behavioural examples that may communicate the normality, value, and feasibility of physical activity. Published evidence, though, suggests that modelling has a relatively small association with youth activity compared with broader parental support.

Parental support appears to operate through several related pathways.

Encouragement, transportation, co-participation, access to resources, and positive communication may reduce both practical and psychological barriers to participation.

Longitudinal evidence also suggests that supportive parental behaviour during early adolescence remains associated with physical activity several years later.

At the same time, parental influence needs to be understood within the wider developmental shift toward adolescent autonomy.

The aim of family influence should not be permanent behavioural control. Family environments should instead support the development of competence, positive expectations, and personally meaningful reasons for remaining active.

The distinction between support and control is therefore important.

Positive parental influence is associated with greater youth physical activity, while punitive, discouraging, or highly controlling approaches receive much less support from the evidence.

The proposed Family Modelling-to-Autonomous Activity Pathway treats parental exercise behaviour as an early social-learning influence rather than a direct or deterministic cause.

Adolescents observe parental behaviour, interpret its meaning, form expectations, develop competence, and gradually decide whether physical activity fits their own values, identity, and lifestyle.

The developmental importance of family modelling therefore lies in more than imitation.

When parents model activity while respecting autonomy, adolescents may gradually move from participating because parents arrange or encourage activity toward participating because they personally value and choose it.

Future research should test this pathway through longitudinal designs that combine objective physical-activity measures with assessments of parental modelling, support, control, autonomy, perceived competence, and peer influence.

The central conclusion is that family influence during adolescence is most likely to support independent activity when parental exercise modelling is combined with practical support, positive encouragement, and respect for developing autonomy.

11. Limitations

The first limitation is that this manuscript does not present a newly collected adolescent participant dataset.

The Results section therefore integrates published findings rather than reporting new empirical estimates.

The second limitation concerns differences among the studies included in the evidence base. Definitions of parental modelling, parental support, parental control, and physical activity vary across studies, which makes direct comparison difficult.

The third limitation concerns developmental differences.

Research often combines children and adolescents even though parental influence may change considerably across developmental stages.

The fourth limitation concerns measurement.

Self-reported physical activity may be affected by recall and social desirability, while objective measures provide different information about actual movement. Existing meta-analytic research has shown that estimates differ according to measurement method.

The fifth limitation concerns causal interpretation.

Relationships between parental and adolescent activity may operate in both directions. Active adolescents may also influence their parents' behaviour, meaning parental modelling should not automatically be interpreted as a one-way process.

The sixth limitation concerns contextual variation.

Socioeconomic resources, neighbourhood conditions, transportation, cultural expectations, and access to organized activities may influence the strength of parental effects.

The seventh limitation concerns peer influence.

Adolescents increasingly receive behavioural information from friends and social groups. These influences may strengthen or weaken family modelling.

The eighth limitation concerns family structure.

Findings from one type of family arrangement may not apply equally across all family contexts.

The ninth limitation concerns studies conducted during or after the pandemic period.

Changes in routines, social contact, schooling, and activity opportunities during this period may have influenced some findings.

The tenth limitation is conceptual.

Independent physical-activity choice is difficult to measure directly. Participation without a parent present does not necessarily indicate autonomous motivation. Future research should therefore assess autonomy psychologically rather than inferring it only from behavioural independence.

12. Future Work

Future research should use longitudinal developmental designs beginning in early adolescence and continuing into later adolescence.

Such designs would help determine whether parental modelling has direct effects on physical activity or works mainly through psychological processes such as perceived competence, values, and motivation.

Objective activity monitoring should be combined with parent and adolescent questionnaires. This would allow researchers to compare parents' reported or measured physical activity with adolescents' perceptions of parental behaviour.

Future studies should clearly separate modelling from support.

Parents may exercise regularly without encouraging adolescents, while other parents may strongly support adolescent activity without being highly active themselves.

Separating these pathways would improve theoretical precision.

Research should also examine autonomy as a mediator.

A key question is whether parental modelling influences activity because adolescents imitate their parents or because repeated exposure contributes to internalized values, competence, and personally endorsed motivation.

Cross-lagged panel designs would help examine reciprocal relationships between parents and adolescents.

Such models could test whether parental activity predicts later adolescent activity and whether adolescent activity also predicts later changes in parental behaviour.

Social-network research could examine whether family influence becomes weaker as peer influence becomes stronger.

It could also examine whether adolescents who identify with active peer groups respond differently to parental modelling.

Future research should study specific forms of parental support separately.

Transportation, encouragement, co-participation, financial assistance, information, and emotional support may influence physical activity through different pathways.

Parental control also requires closer examination.

Longitudinal research should test whether controlling behaviour reduces physical activity directly or works indirectly through lower autonomy, motivation, or enjoyment.

Intervention studies should compare autonomy-supportive family programs with more directive approaches.

Outcomes should include physical activity, autonomous motivation, perceived competence, enjoyment, and long-term maintenance.

Future studies should also include adolescents from diverse socioeconomic and cultural backgrounds.

Existing evidence suggests that relationships between family support and physical activity differ across socioeconomic groups, making contextual analysis important.

Finally, future research should examine whether family modelling continues to influence behaviour after adolescents leave the family home.

Such research would provide stronger evidence about whether parental modelling becomes sufficiently internalized to shape physical activity after direct parental supervision declines.

13. Declarations

Conflict of Interest

The author declares no conflict of interest related to this manuscript.

Funding

No external funding was received for preparation of this evidence-informed research manuscript.

Ethics Statement

This manuscript does not report newly collected human-participant data. It synthesizes findings from previously published research.

Future empirical studies involving adolescents should obtain approval from an appropriate research ethics committee, secure informed consent and adolescent assent where required, and follow suitable procedures for confidentiality, safeguarding, and secure data management.

Data Availability

No original participant-level dataset was generated or analyzed for this manuscript. Quantitative findings reported in the Results section are drawn from previously published studies and are presented with appropriate source attribution.

References

1. Biddle, S. J. H., Gorely, T., Faulkner, G., & Mutrie, N. (2015). *Psychology of physical activity: Determinants, well-being and interventions* (3rd ed.). Routledge.
2. Beets, M. W., Cardinal, B. J., & Alderman, B. L. (2010). Parental social support and the physical activity-related behaviors of youth: A review. *Health Education & Behavior*, 37(5), 621–644. <https://doi.org/10.1177/1090198110363884>
3. Berge, J. M., MacLehose, R. F., Loth, K. A., Eisenberg, M. E., Fulkerson, J. A., & Neumark-Sztainer, D. (2012). The importance of families to adolescents' physical activity and dietary intake. *Adolescent Medicine: State of the Art Reviews*, 23(3), 530–544.
4. Corder, K., van Sluijs, E. M. F., McMinn, A. M., Ekelund, U., & Griffin, S. J. (2010). Perception versus reality: Awareness of physical activity levels of middle- and high-school students. *Journal of Physical Activity and Health*, 7(4), 476–482.
5. Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.
6. Edwardson, C. L., & Gorely, T. (2010). Parental influences on different types and intensities of physical activity in youth: A systematic review. *Psychology of Sport and Exercise*, 11(6), 522–535.
7. Epstein, L. H., Paluch, R. A., Gordy, C. C., & Dorn, J. (2000). Decreasing sedentary behaviors in treating pediatric obesity. *Archives of Pediatrics & Adolescent Medicine*, 154(3), 220–226.
8. Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents. *International Journal of Behavioral Nutrition and Physical Activity*, 10, 98.
9. Gillison, F. B., Standage, M., & Skevington, S. M. (2011). Relationships among adolescents' weight perceptions, exercise goals, exercise motivation, quality of life and leisure-time exercise behaviour. *Psychology & Health*, 26(1), 2–21.
10. Haerens, L., Kirk, D., Cardon, G., & De Bourdeaudhuij, I. (2010). Motivational profiles for secondary school physical education and its relationship to the adoption of a physically active lifestyle among university students. *European Physical Education Review*, 16(1), 117–139.

11. Hagger, M. S., Chatzisarantis, N. L. D., & Harris, J. (2006). From psychological need satisfaction to intentional behavior: Testing a motivational sequence in two behavioral contexts. *Personality and Social Psychology Bulletin*, 32(10), 131–148.
12. Hagger, M. S., Chatzisarantis, N. L. D., Culverhouse, T., & Biddle, S. J. H. (2003). The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behavior. *Journal of Educational Psychology*, 95(4), 784–795.
13. Hamilton, K., Cox, S., & White, K. M. (2012). Testing a model of physical activity among mothers and fathers of young children: Integrating self-determined motivation, planning, and the theory of planned behavior. *Journal of Sport & Exercise Psychology*, 34(1), 124–145.
14. Jago, R., Fox, K. R., Page, A. S., Brockman, R., & Thompson, J. L. (2010). Development of scales to measure children's perceptions of friends' and parents' influences on physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, 7, 67.
15. Kim, J., Eys, M., & Robertson-Wilson, J. (2021). “If they do it, so can I”: A test of a moderated serial mediation model of descriptive norms, self-efficacy, and perceived similarity for predicting physical activity. *Psychology & Health*, 36(6), 701–718. <https://doi.org/10.1080/08870446.2020.1789641>
16. Kitzman-Ulrich, H., Wilson, D. K., St. George, S. M., Lawman, H., Segal, M., & Fairchild, A. (2010). The integration of a family systems approach for understanding youth obesity, physical activity, and dietary programs. *Clinical Child and Family Psychology Review*, 13, 231–253.
17. Kremers, S. P. J., de Vries, N. K., Mudde, A. N., & de Vries, H. (2004). Parenting style and adolescent fruit consumption. *Appetite*, 43(1), 81–90.
18. Lubans, D. R., Morgan, P. J., Callister, R., Collins, C. E., & Plotnikoff, R. C. (2010). Exploring the mechanisms of physical activity and dietary behavior change in the Healthy Dads, Healthy Kids intervention. *Journal of Science and Medicine in Sport*, 13(2), e1.
19. McMinn, A. M., van Sluijs, E. M. F., & Griffin, S. J. (2013). Family and home influences on children's physical activity: A review. *International Journal of Behavioral Nutrition and Physical Activity*, 10, 89.
20. Ornelas, I. J., Perreira, K. M., & Ayala, G. X. (2007). Parental influences on adolescent physical activity: A longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity*, 4, 3.

21. Owen, N., Healy, G. N., Matthews, C. E., & Dunstan, D. W. (2010). Too much sitting: The population-health science of sedentary behavior. *Exercise and Sport Sciences Reviews*, 38(3), 105–113.
22. Petersen, T. L., Møller, L. B., Brønd, J. C., Jepsen, R., & Grøntved, A. (2020). Association between parent and child physical activity: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 17, 67. <https://doi.org/10.1186/s12966-020-00966-z>
23. Plotnikoff, R. C., Costigan, S. A., Karunamuni, N., & Lubans, D. R. (2013). Social cognitive theories used to explain physical activity behavior in adolescents: A systematic review and meta-analysis. *Preventive Medicine*, 56(5), 245–253. <https://doi.org/10.1016/j.ypmed.2013.01.013>
24. Rhodes, R. E., McEwan, D., & Rebar, A. L. (2019). Theories of physical activity behaviour change: A history and synthesis of approaches. *Psychology of Sport and Exercise*, 42, 100–109.
25. Rhodes, R. E., & Kates, A. (2015). Can the affective response to exercise predict future motives and physical activity behavior? A systematic review of published evidence. *Annals of Behavioral Medicine*, 49(5), 715–731.
26. Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
27. Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine & Science in Sports & Exercise*, 32(5), 963–975.
28. Sallis, J. F., Alcaraz, J. E., McKenzie, T. L., & Hovell, M. F. (1999). Predictors of change in children's physical activity over 20 months: Variations by gender and level of adiposity. *American Journal of Preventive Medicine*, 16(3), 222–229.
29. Silva, M. N., Markland, D., Carraça, E. V., Vieira, P. N., Coutinho, S. R., Minderico, C. S., Matos, L., Sardinha, L. B., & Teixeira, P. J. (2011). Exercise autonomous motivation predicts 3-yr weight loss in women. *Medicine & Science in Sports & Exercise*, 43(4), 728–737.
30. Su, D. L. Y., Tang, T. C. W., Chung, J. S. K., Lee, A. S. Y., Capio, C. M., & Chan, D. K. C. (2022). Parental influence on child and adolescent physical activity level: A meta-analysis. *International Journal of Environmental Research and Public Health*, 19(24), 16861. <https://doi.org/10.3390/ijerph192416861>

31. Trost, S. G., & Loprinzi, P. D. (2011). Parental influences on physical activity behavior in children and adolescents: A brief review. *American Journal of Lifestyle Medicine*, 5(2), 171–181. <https://doi.org/10.1177/1559827610387236>
32. Trost, S. G., Sallis, J. F., Pate, R. R., Freedson, P. S., Taylor, W. C., & Dowda, M. (2003). Evaluating a model of parental influence on youth physical activity. *American Journal of Preventive Medicine*, 25(4), 277–282.
33. Verloigne, M., De Bourdeaudhuij, I., Tanghe, A., D'Hondt, E., Theuwis, L., & Deforche, B. (2011). Self-determined motivation towards physical activity in adolescents: A longitudinal analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 8, 2.
34. Vega-Díaz, M., González-García, H., & de Labra, C. (2023). Influence of parental involvement and parenting styles in children's active lifestyle: A systematic review. *PeerJ*, 11, e16668. <https://doi.org/10.7717/peerj.16668>
35. Wentzel, K. R. (2009). Students' relationships with teachers as motivational contexts. In K. R. Wentzel & D. B. Miele (Eds.), *Handbook of motivation at school* (pp. 301–322). Routledge.
36. Yao, C. A., & Rhodes, R. E. (2015). Parental correlates in child and adolescent physical activity: A meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 12, 10. <https://doi.org/10.1186/s12966-015-0163-y>
37. Yoo, S., Kang, S., & Lee, J. (2018). The longitudinal effect of parental support during adolescence on the trajectory of sport participation from adolescence through young adulthood. *Journal of Exercise Rehabilitation*, 14(2), 193–199.
- Edwardson, C. L., & Gorely, T. (2010). Parental influences on different types and intensities of physical activity in youth: A systematic review. *Psychology of Sport and Exercise*, 11(6), 522–535.