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Associations of Parental General Monitoring with Adolescent Weight-Related Behaviors and Weight Status

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Objective: This study examined how parental general monitoring (PGM), which refers to parental awareness of adolescents' activities in various domains, is associated with adolescents' weight status and related behaviors and whether these relationships differ among racial/ethnic groups.

Methods: Data are from 4,088 Black, Latino, and White youth assessed in seventh grade (mean age = 13.06). BMI percentile based on measured height and weight indicated weight status. PGM was assessed by adolescent report of parents' awareness of money spending, friends, and whereabouts. Adolescents reported both healthy and unhealthy dietary intake (DI), physical activity, and screen time over the past 7 days. Total sample and multigroup structural models were estimated.

Results: PGM was associated with lower weight status for the total sample, as well as being positively associated with healthy DI and physical activity and inversely associated with screen time across racial/ethnic groups. PGM was also inversely associated with unhealthy DI, except for in Black adolescents. There was an indirect effect from PGM to lower weight status via reduced screen time among Latino and White adolescents.

Conclusions: Positive outcomes associated with PGM are extended to weight status and related behaviors. Efforts at improving weight status and related behaviors could benefit from addressing general parenting practices with their children.

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Introduction

The prevalence of obesity has been increasing since the 1970s and currently affects approximately 12.7 million children and adolescents in the United States (1). Furthermore, obesity disparities have already been documented in adolescence, with Latino adolescents more often meeting criteria for obesity than Black adolescents and both groups doing so more often than White adolescents (1). Obesity is generally described as being due, in part, to both insufficient physical activity (PA) and excessive dietary intake (DI) (2). Adolescent obesity has distinct characteristics, including accruing normative weight gain (3) and becoming increasingly physically inactive compared with childhood (2). Moreover, adolescents start to form DI independently of their parents, especially as they are more often away from the home, and this DI includes fast food intake with their peers (3). Yet it remains unclear how much parents influence DI and PA during adolescence.

Parental influences shape children's eating behaviors from early in childhood through the availability and accessibility of food in the home (4) and by restriction and promotion of certain foods and amounts (5). Parents are considered to be the gatekeepers of food up until early adolescence and continue to have responsibility for feeding (6), although adolescents increasingly make independent DI choices (3). Moreover, parents influence adolescents' PA levels (7) by providing encouragement, by being present at activities, and by providing logistic support (e.g., driving adolescents to activities) (8). Furthermore, parents can also influence sedentary activity by limiting TV, computer, and other screen time.

Parental general monitoring

Parental general monitoring (PGM) of adolescents is a recommended practice because of its influence across a range of adolescent behaviors (9). It is a context-specific practice in which parents maintain awareness

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of an adolescent's whereabouts and activities based on physical presence and communication with the adolescent (9). Further, parental presence and communication undergird an approach of positive engagement between parent and child, which should foster healthy child development. Indeed, PGM has been associated with better developmental outcomes broadly (10), including better school achievement (11) and reduced behavior problems (12) and health-risk behaviors, such as alcohol intake (13) and substance use (14). Because parental awareness and communication are fundamental for influencing children's healthy development, this practice could also influence an adolescent's everyday behaviors, including DI and PA. Similarly, a previous study found that communication with parents was associated with adolescents' healthier weight-related behaviors such as eating less fast food and engaging in sufficient PA (15). Certainly, without parental presence and communication, it would be difficult for parents to affect adolescents' DI and PA and ultimately their weight status. Therefore, we want to test the hypothesis that PGM is associated with adolescents' healthier DI, PA, and weight status.

Despite the large literature on the positive effects of PGM, little attention has been paid to its associations with adolescent weight-related behaviors and weight status. We are aware of only three studies, but these show mixed findings: one study found that having no curfew, an indication of less monitoring, was associated with a higher likelihood of retaining obesity from adolescence into young adulthood (16); a second study showed no association between parental monitoring of adolescent activities and adolescent obesity (17); and a third study reported that monitoring was associated specifically with lower consumption of sugar-sweetened beverages (4), a commonly targeted DI behavior when attempting to reduce obesity. The current study attempts to enhance understanding of whether and how PGM plays a role in adolescent weight status by examining its relationship with weight-related healthy behaviors, such as healthy DI and PA, and unhealthy behaviors, such as unhealthy DI and screen time. If these relationships are supported, this extends the literature on the broad benefits of PGM and on PGM as a potentially impactful target for improving DI, PA, and ultimately weight status in adolescents.

Different patterns across race/ethnicity

Furthermore, it will be important to examine how these associations among PGM and adolescent weight-related behaviors and weight status may differ across racial/ethnic groups. Three sets of findings indirectly raise this possibility. First, it is well established that the prevalence of obesity and overweight is significantly higher among Black and Latino compared with White adolescents (1). Second, less healthy DI and low PA among Blacks and Latinos can partly explain their higher prevalence of obesity (18,19). For instance, it has been shown that Black adolescents engage in lower levels of PA and are less likely to participate in organized sports (19), and Latino adolescents are more likely to have longer periods of screen time than their White peers (20). Third, parental communication and supervision styles appear to differ among racial/ethnic groups (21) because culture plays a crucial role in shaping parenting skills, values, and goals (22). These findings raise the question of whether higher weight status and less healthy DI and PA patterns may in part be influenced by lower PGM among Black and Latino parents. Potentially finding significant relationships among PGM, DI, and PA and weight status among these racial/ethnic groups can suggest more targeted interventions to improve weight status in the different groups.

Current study

Building on this prior literature, we propose the model depicted in Figure 1, which identifies hypothesized relationships among PGM, weight-related behaviors, and weight status in adolescence. This model leads to three specific hypotheses: PGM is (H1) positively associated with adolescents' healthy DI and PA, (H2) inversely associated with their unhealthy DI and screen time, and (H3) inversely associated with their weight status both directly and indirectly, the latter through healthy and unhealthy DI, PA, and screen time. In addition, we will explore how these relationships may differ across the three largest racial/ethnic groups in the United States.

Methods

Data came from Healthy Passages, a multisite, longitudinal cohort study of health behaviors and outcomes and associated factors (23,24), specifically from the seventh-grade assessments. Institutional review boards at all research sites approved this study.

Participants

Sampling for the Healthy Passages study included fifth graders in regular public-school classrooms from three sites (Birmingham, Alabama; Los Angeles, California; and Houston, Texas). Public schools were randomly selected, with probabilities proportionate to a weighted measure of the scarcity of a school's racial/ethnic mix corresponding to a site's racial/ethnic target to ensure adequate sample sizes of Black, Latino, and White students (23). All fifth-grade students within selected schools were invited to participate by their school (24). Among 5,147 families that provided permission to be contacted and then completed interviews in fifth grade, 4,773 (93%) completed the seventh-grade assessments. To focus on the three largest racial/ethnic groups, those not identified as Black, Latino, or White were omitted from the analysis. This resulted in an analysis sample of 4,088 families with complete data, with an unweighted (weighted) distribution of 37% (30%) Black, 37% (47%) Latino, and 26% (23%) White and with 51% being female, a mean age of 13.06 (SD = 0.58), and 92% living in a household with two adults present.

Procedure

This research was conducted in compliance with American Psychological Association ethical standards in the treatment of participants. The adolescent and one of his/her parents (mother, 89%; father, 6%; other, 5%) were interviewed at home or at a research site. The parent provided informed consent and the adolescent provided assent, after which they were separated into private spaces. Interview and anthropometric data were collected by trained field staff following a standard protocol at each site. Individual interviews consisted of a computer-assisted personal interview and an audio-computer–assisted self-interview for sensitive questions. English and Spanish versions of the instruments could be selected by the interviewee. This procedure was repeated at each assessment.

Measures

All measures relevant for this study were collected during the seventh-grade assessment.

PGM was assessed with four items selected from previous studies (12,14,25) in which adolescents reported on their parents' monitoring behavior regarding "How many of your friends do your parents know?"; "Do your parents know where you are after school?"; "Do your parents know how you spend your free time?"; and "Do your parents know how

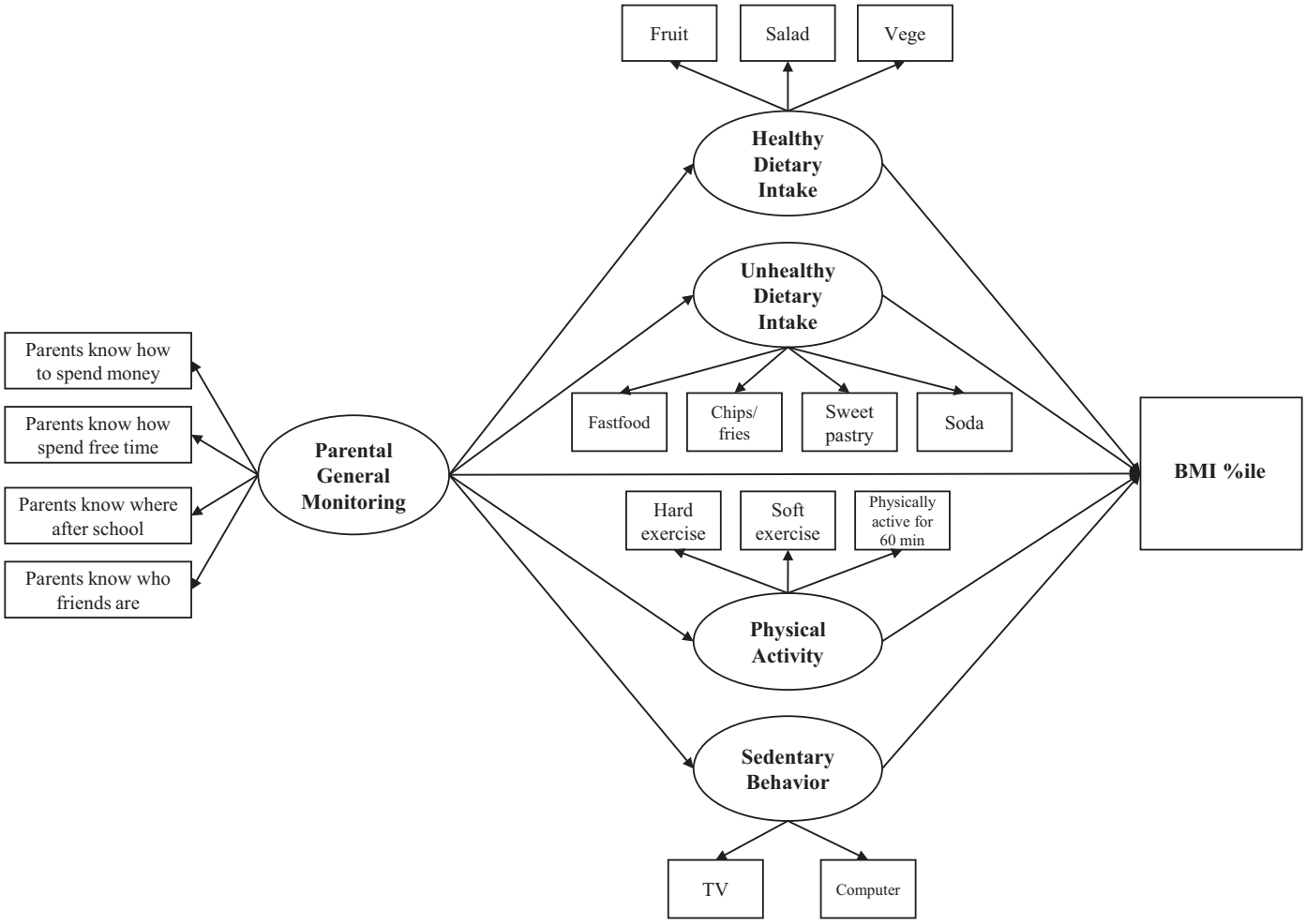

Figure 1 Conceptual model identifying hypothesized relationships among parental general monitoring, weight-related behaviors, and weight status (BMI percentile) in adolescence, including observed measures used for each concept.

you spend money?" Adolescents responded from four ordinal options, ranging from "Do not know much (1)" to "Know a lot (4)," indicating more monitoring. High scores on these and similar items have been associated with better developmental outcomes in various domains (12,14), supporting the validity of this measure of PGM.

Healthy DI was assessed by adolescent reporting using items adapted from the School-Based Nutrition Monitoring secondary-level student questionnaire (26), a food frequency questionnaire covering the past 7 days. Adolescents reported consumption of three food categories in the past week, including fruits, green vegetables, and green salad, which are commonly included in the Dietary Guidelines for Americans (27) and measures of healthy DI (e.g., (28,29)). Each category was defined with multiple examples and provided seven response options, including (1) "none," (2) "1-3 times during the past 7 days," (3) "4-6 times during the past 7 days," (4) "1 time per day," (5) "2 times per day," (6) "3 times per day," and (7) "4 or more times per day." Each reported DI category was treated as an ordinal scale, providing three observed measures of healthy DI (Figure 1). As detailed in online Supporting Information, multigroup measurement invariance (MMI) testing supported the inclusion of these three food categories as the best-observed indicators of the latent construct of healthy DI, demonstrating that they form a reliable measurement in each racial/ethnic group. Several additional food categories (e.g., whole wheat, low-fat dairy) were also examined in this manner, but results from MMI testing (details available from authors) did not support their inclusion in the measurement of the latent construct of healthy DI.

Unhealthy DI was assessed in the same manner as healthy DI but addressed four unhealthy DI categories, including fast food, soda, chips and fries, and sweet pastries. These are common markers of unhealthy DI (e.g., (28)), and MMI testing supported the inclusion of these four food categories as the best-observed indicators of the latent construct of unhealthy DI. Several additional food categories were considered, but results from MMI testing (details available from authors) did not support their inclusion in the measurement of the latent construct of unhealthy DI. Each reported DI category was treated as an ordinal scale, providing four observed measures of unhealthy DI (Figure 1).

PA was assessed using three items adapted from the Patient-centered Assessment and Counseling for Exercise plus Nutrition screening measure for PA on a 7-day recall (30) in which adolescents reported time spent in the past week (1) engaging in exercise for at least 20 minutes

that made them sweat and breathe hard, which defined strenuous PA; (2) taking part in PA for at least 30 minutes that did not make them sweat or breathe hard, which defined moderate PA; and (3) being physically active in any kind of activity from among those listed in (1) and (2) for a total of at least 60 minutes. In all cases, several activities were provided as examples. Weekly time spent in each type of PA (types 1-3) provided three observed measures of PA (Figure 1).

Screen time was assessed by adolescents' reporting of time spent in two marker behaviors focused on reported time: (1) using the computer (e.g., browsing the internet, homework, emailing, games) and (2) watching television in five defined periods (on weekdays before 7 PM, Monday through Thursday after 7 PM, Friday after 7 PM, and any time on Saturday and Sunday).

Weight status was measured with a standard anthropometric protocol (31). Weight was measured to the nearest 0.1 kg using a Tanita electronic digital scale (BWB-800S; Tanita, Arlington Heights, Illinois). Standing height was measured to the nearest millimeter using a portable stadiometer (PE-AIM-101; Perspective Enterprises, Portage, Michigan). Two independent measurements were taken for weight and height; if the measurements differed by 0.2 kg or more for weight or 0.5 cm or more for height, a third measurement was taken. The two weight or height measurements closest in agreement were averaged and used to calculate BMI as weight in kilograms divided by height in meters squared. Finally, BMI percentiles were calculated for adolescents using the Centers for Disease Control and Prevention gender- and age-specific charts (32), with a high score indicating higher weight status.

Race/ethnicity was classified based on parent report of adolescent's race/ethnicity. Following Census style, the adolescent was classified as Latino if so indicated, regardless of other racial/ethnic indication. Adolescents not categorized as Latino were classified as (non-Latino) Black, (non-Latino) White, or other (which was excluded from analysis).

Parental education level was based on parent-reported highest education completed in the household, which was coded as (1) eighth grade or less, (2) some high school, (3) high school graduation or general education diploma, (4) some college or 2-year college degree, (5) 4-year college degree, and (6) more than 4-year college degree. Parental education is the most stable indicator of socioeconomic status (33) and is considered best for use with members of racial/ethnic minority groups, who do not receive the same financial gains for equivalent years of education as do White individuals (34,35).

Analytical procedure

Sampling weights accounting for complex survey design were used in all analyses, which accounted for the effects of design, nonresponse, attrition over time, clustering of youth within schools in each area, and stratification by site (24). Path analysis of the total sample and multigroup structural models (MGSEMs) for each race/ethnicity were estimated using Mplus version 7.4 (Muthén & Muthén, Los Angeles, California). Three goodness-of-fit indices were examined to determine how well the model reproduced characteristics of the observed data: comparative fit index (CFI), Tucker-Lewis index (TLI), and root-mean-square error of approximation (RMSEA). CFI and TLI values above 0.95 are considered to indicate adequate fit, whereas values greater than 0.90 are considered to be acceptable fit; in contrast, RMSEA values of 0.05 or less indicate a close fit, whereas values of 0.08 or less indicate adequate fit (36).

Specifically, MGSEMs were measured with the weighted least squares mean and variance-adjusted estimator and theta parameterization. Structural paths were compared across Black, Latino, and White (reference) groups. Before the structural paths of the MGSEMs could be compared across groups, MMI of the latent variables in our model (PGM, healthy DI, unhealthy DI, PA, and screen time) had to first be established. Because this aspect of the analysis does not directly pertain to the study aims and hypotheses, the MMI analysis plan and results are detailed in the online Supporting Information. In summary, the measurement model indicated good fit for the specified observed indicators (see "Measures") as measures of the latent constructs of PGM, healthy DI, unhealthy DI, and PA across racial/ethnic groups. However, because screen time yielded unsatisfactory fit, weekly hours of TV and computer time were instead summed to form a composite screen time score, which was used in subsequent analyses as an observed variable. With this adjustment, both configural and metric multigroup invariance was established.

After measurement invariance was established, MGSEMs were estimated and model fit was evaluated with the χ^2 goodness-of-fit statistic, CFI, TLI, and RMSEA. To estimate the MGSEMs, the factor loadings were constrained to be equal across groups, but the item intercepts/thresholds were allowed to vary freely among groups. Child gender and parental education were entered as control variables in the MGSEM analyses.

Results

Descriptive statistics for study variables and correlations among them are shown in Tables 1 and 2, respectively.

Structural model for the total sample

Structural equation modeling on the total sample indicated that the model fitted the data well: CFI = 0.93, TLI = 0.91, and RMSEA = 0.04. As detailed in Figure 2, PGM was inversely related to adolescents' weight status. Moreover, PGM was positively associated with healthy DI and PA and inversely with unhealthy DI and screen time. There was no significant association of either healthy DI or PA with weight status. However, screen time was positively associated and unhealthy DI was inversely associated with weight status.

Structural model across racial/ethnic groups

The MGSEM that freely estimated all paths across race/ethnicity showed adequate fit: χ^2 (df) = 996.78 (311), P = 0.00, CFI = 0.88, TLI = 0.86, and RMSEA = 0.04. Coupled with the good model fit for the total sample, we argue that the data fitted the multigroup model sufficiently. Several additional models were tested in which paths that differed in significance across groups were constrained to be equal across groups (37). Each path was tested individually based on a constrained model (37).

The resulting significant ($P < 0.05$) path coefficients for each group, reported in Figure 2, indicated the following. PGM was positively associated with Black adolescents' healthy DI and PA and inversely associated with their screen time. Screen time, in turn, was positively associated with weight status in Black adolescents. All four paths from PGM to healthy DI, unhealthy DI, PA, and screen time

TABLE 1 Descriptive statistics for study variables for total sample and racial/ethnic groups

		Mean (SD)			
	Scale	Total (*n* = 4,048)	Black (*n* = 1,497)	Latino (*n* = 1,502)	White (*n* = 1,039)
Parental monitoring[a]: Parent knows…	1-4				
Adolescent's friends		3.00 (0.95)	3.71 (0.99)	2.81 (0.94)	3.40 (0.76)
Where adolescent is after school		3.72 (0.66)	3.71 (0.68)	3.62 (0.75)	3.87 (0.41)
How adolescent spends money		3.40 (0.88)	3.34 (0.93)	3.28 (0.93)	3.64 (0.66)
What adolescent does in free time		3.47 (0.82)	3.45 (0.86)	3.37 (0.88)	3.62 (0.62)
Physical activity[b]	0-7				
Strenuous exercise		4.09 (2.18)	3.92 (2.28)	3.90 (2.12)	4.58 (2.03)
Moderate exercise		2.91 (2.35)	2.89 (2.37)	2.56 (2.20)	3.45 (2.42)
Exercising for 60 min		3.15 (2.34)	3.15 (2.40)	2.74 (2.22)	3.74 (2.29)
Screen time[c]	0-35				
TV and computer use (h/wk)		18.17 (4.56)	19.84 (4.56)	17.95 (4.16)	16.06 (4.19)
Healthy DI[b]	0-7				
Green vegetables		3.30 (1.37)	3.26 (1.66)	3.10 (1.59)	3.52 (1.45)
Fruits		3.85 (1.71)	3.74 (1.80)	3.88 (1.74)	3.96 (1.51)
Salad		2.30 (1.37)	2.36 (1.50)	2.23 (1.37)	2.30 (1.15)
Unhealthy DI[b]	0-7				
Fast food		2.27 (1.23)	2.60 (1.41)	2.27 (1.16)	1.82 (0.85)
Soda		3.12 (1.69)	3.49 (1.86)	3.09 (1.59)	2.60 (1.41)
Chips/fries		2.70 (1.37)	3.07 (1.54)	2.63 (1.34)	2.27 (0.96)
Sweet pastries		2.41 (1.37)	2.78 (1.58)	2.22 (1.28)	2.13 (0.98)
Weight status[d]					
BMI percentile	1-100	71.98 (26.67)	74.64 (25.78)	75.27 (25.12)	63.46 (28.23)

[a]Scores ranged from "almost never" to "almost always."
[b]Scores ranged from 0 d/wk to 7 d/wk.
[c]Scores ranged from 0 h/wk to 35 h/wk.
[d]Score ranged from 0th percentile to 100th percentile.
DI, dietary intake.

were significant in the expected directions for Latino adolescents. However, whereas screen time had a positive association, unhealthy DI was inversely associated with weight status in Latino adolescents. Lastly, PGM was positively associated with White adolescents' healthy DI and PA and inversely associated with their unhealthy DI and screen time. White adolescents' unhealthy DI and screen time were positively related to weight status. In none of the racial/ethnic groups was there a significant association between PGM and adolescent weight status.

Direct and indirect associations

Direct and indirect paths from PGM to adolescents' weight status were tested separately for the total sample and for each race/ethnicity. As presented in Table 3, PGM was directly related to adolescents' weight status in the total sample. Indirect effects for the total sample were found from PGM to weight status via screen time and unhealthy DI. On the other hand, when tested in multigroup analysis, there were no significant direct effects from PGM to weight status for any group. Yet there were indirect effects through screen time for White adolescents and through screen time and unhealthy DI for Latino adolescents.

Discussion

PGM has been shown to be beneficial for a range of adolescent health and developmental outcomes (10). We quite consistently observed the same pattern across Black, Latino, and White adolescents of PGM being positively associated with adolescents' healthy DI and PA and being inversely associated with their unhealthy DI and screen time. One exception was the absence of an association for Black adolescents between PGM and unhealthy DI. PGM was also associated with lower weight status in the sample as a whole. Although there were few associations between these weight-related behaviors and adolescent weight status, the inverse association only for Latinos between unhealthy DI and weight status was counterintuitive. However, there was an indirect effect consistent with expectations for both Latino and White adolescents whereby more PGM was associated with reduced screen time, which in turn was associated with lower weight status.

Regarding potential effects on weight status, it was noteworthy to find that not only is PGM associated with adolescents' lower weight status, but such parental behaviors also appear to be linked with adolescents engaging in more healthy and fewer unhealthy weight-related behaviors generally in all three racial/ethnic groups. Although rarely examined

TABLE 2 Correlations of variables

	Parental general monitoring				Physical activity			Healthy dietary intake			Unhealthy dietary intake				Screen time	BMI%
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1															
2	0.30	1														
3	0.31	0.36	1													
4	0.30	0.34	0.41	1												
5	0.11	0.09	0.07	0.08	1											
6	0.12	0.06	0.06	0.07	0.38	1										
7	0.13	0.08	0.09	0.09	0.55	0.40	1									
8	0.12	0.06	0.08	0.09	0.14	0.11	0.13	1								
9	0.08	(0.05)	(0.02)	(0.05)	0.14	0.10	0.12	0.50	1							
10	0.07	(−0.01)	(0.00)	(0.05)	0.10	0.08	0.09	0.37	0.30	1						
11	−0.07	−0.11	−0.09	−0.09	(−0.02)	(0.01)	(−0.02)	(0.05)	0.11	0.12	1					
12	(−0.05)	−0.08	−0.09	−0.07	(−0.02)	(0.01)	(0.01)	0.06	0.11	(0.03)	0.32	1				
13	(−0.05)	−0.07	−0.09	−0.08	(−0.01)	(0.03)	(0.01)	(0.04)	0.11	0.19	0.40	0.36	1			
14	(−0.02)	(−0.05)	−0.09	−0.09	(0.00)	(0.04)	(0.03)	(0.04)	0.11	0.12	0.34	0.32	0.43	1		
15	−0.16	−0.07	−0.10	−0.07	−0.11	−0.09	−0.08	−0.08	−0.09	−0.06	0.17	0.19	0.16	0.12	1	
16	−0.09	(−0.05)	(−0.04)	(−0.05)	(−0.01)	−0.06	−0.06	(−0.03)	(−0.03)	(0.04)	(0.01)	(0.03)	(−0.01)	−0.07	0.11	1

All correlations ≥ 0.06, $P < 0.05$; nonsignificant correlations are in parentheses.
Variables: 1 = parents know adolescent's friends; 2 = parents know where adolescent is after school; 3 = parents know how adolescent spends money; 4 = parents know what adolescent does in free time; 5 = days of hard exercise ; 6 = days of soft exercise; 7 = days of exercising for 60 min; 8 = green vegetable intake; 9 = fruit intake; 10 = salad intake; 11 = fast food intake; 12 = soda intake; 13 = chips/fries intake; 14 = sweet pastry intake; 15 = screen time ; 16 = BMI percentile in seventh grade.

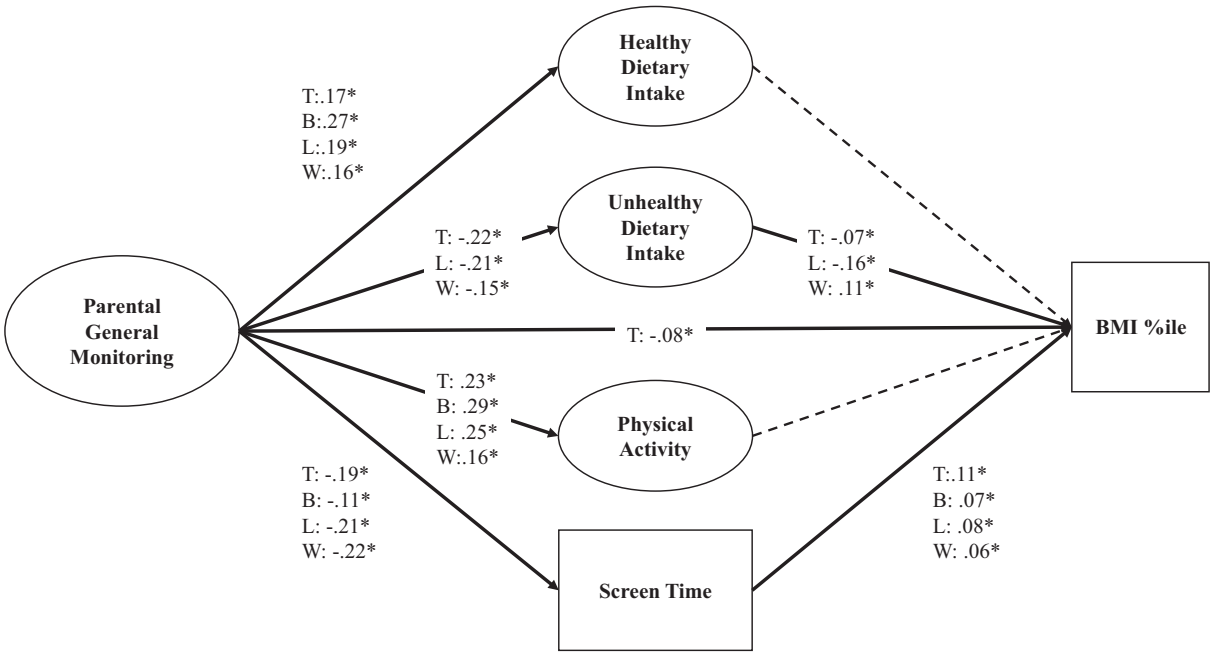

Figure 2 Final model with standardized path coefficients. Although not shown in the figure, child gender and parental education were entered as control variables. Ellipses and rectangles represent unobserved latent and observed variables, respectively. Dashed line indicates a nonsignificant path. *indicates a statistically significant path ($P < 0.05$). T: RMSEA: 0.036 (0.034, 0.039); CFI: 0.926; TLI: 0.909; multigroup analysis: RMSEA: 0.040 (0.038, 0.043); CFI: 0.876; TLI: 0.857. B, Black; CFI, comparative fit index; L, Latino; RMSEA, root-mean-square error of approximation; T, total sample; TLI, Tucker-Lewis index; W, White.

TABLE 3 Direct and indirect effects from PGM to adolescent weight status

		β	*P* value
Direct effect	**Total sample**	**−0.08**	**0.00**
PGM → WS	Black	0.02	0.71
	Latino	−0.07	0.10
	White	−0.04	0.45
Indirect effect	**Total sample**	**−0.02**	**0.00**
PGM → WS through	Black	−0.01	0.06
screen time	**Latino**	**−0.02**	**0.01**
	White	−0.01	0.04
Unhealthy DI	**Total sample**	**0.02**	**0.00**
	Black	0.00	0.77
	Latino	**0.03**	**0.00**
	White	−0.02	0.08

Bold indicates significant coefficient, $P < 0.05$. Because DI and PA are not associated with WS, there cannot be an indirect effect through these variables. Child gender and parental education controlled for in all analyses.
DI, dietary intake; PA, physical activity; PGM, parental general monitoring; WS, weight status.

in previous research, the present findings are consistent with those of two studies (4,16), although these had a more limited focus. However, another previous study found no relationship between parental monitoring and adolescent obesity (5), but monitoring was reported by parents rather than as in the present study by adolescents. These contrasting findings suggest that it is the adolescents' perception of parental practices that matters in potentially influencing them toward healthier behaviors.

It should be emphasized that PGM is not narrowly focused on monitoring adolescents' DI and PA but represents a general parenting strategy that is applied broadly to support their positive development. PGM is a reciprocal process in which parents and adolescents engage with one another, such that parents stay aware of what the adolescent is doing both in and out of the home, through observations and communication (10). This engagement depends on the adolescents' willingness to communicate, indeed disclose, as parents no longer can rely on direct observation because the adolescent is expected increasingly to individuate from parents (10). Bonds that parents and adolescents built in the earlier years lay the foundation for this reciprocal process, as the adolescents will make an effort to maintain the good relationship with their parents (10), which reinforces the protective role of parental monitoring.

Further research should now examine how PGM specifically influences DI and PA in adolescence. Presumably, PGM is associated with some behavior-specific practices more proximally influencing healthier eating and PA. Greater physical presence, which is part of monitoring practice, may foster more frequent family meals, through which healthier DI can occur. Parent–adolescent communication, another element of PGM, develops throughout childhood. Once communication is well-established, parents can influence adolescent DI and PA through sharing health-promoting information and feedback that is more likely to be heeded. These and other avenues through which PGM can affect weight-related behaviors should be examined in future research.

The current study extends literature on PGM, showing that it is also associated with weight-related behaviors and weight status in diverse adolescents. Collectively, these findings suggest that it may be useful to address broader positive parenting practices, toward being engaged with and responsive to their children and communicating expectations for their children's behavior in general, when attempting to maintain healthy weight in adolescents. These findings also suggest these parenting practices could be useful across Black, Latino, and White families. Although these hypotheses require testing with experimental methods, the added benefit should be broader positive impacts on adolescent development and health based on much other literature (10).

The findings on the associations between healthy and unhealthy DI, PA, and sedentary activity and weight status were few and, in some ways, inconsistent with expectations. It was the health-risk behaviors of unhealthy DI and screen time that were linked with adolescents' weight status rather than healthy DI and PA. Although healthier DI and PA are generally endorsed as beneficial for adolescent health, the role of these behaviors in the weight status outside of the clinical range has been less clear. As some other studies have also reported (35,36), we found no support for these associations in a diverse community sample. The counterintuitive inverse association in Latinos between unhealthy DI, here measured as intake of fast food, soda, chips and fries, and sweet pastries, and weight status should be interpreted with caution. Mainly, this should spur researchers to investigate additional unmeasured correlates of unhealthy eating that might influence weight status in Latino youth. The most uniform finding was that screen time was positively associated with weight status in all groups, which is consistent with prior research (38).

One limitation is that, as an observational study, results cannot support causal inferences. Also, potential biases and errors in adolescents' retrospective self-report of DI and PA must be acknowledged. A tendency to provide socially desirable responses may have resulted in adolescents overreporting healthier behaviors and positive parenting practices. Alternative measurement methodologies, such as concurrent recording of behaviors using smart phones, are needed to clarify the relationship between these weight-related behaviors and weight status. Moreover, PGM was measured by adolescent report, which reflects their subjective experience and may not correspond with what parents think they do. Findings might not generalize to the population of the United States because participants were sampled from three geographic areas and were restricted to three racial/ethnic groups. Because the Latino participants were mainly enrolled in Los Angeles and Houston, they had familial roots primarily in Mexico and Central America. Due to their heterogeneity, caution must be exercised in generalizing to Latino groups with other origins.

Conclusion

The current findings suggest that PGM has the potential to promote adolescents' healthy weight status. Taken together, these findings suggest that teaching positive parenting values and skills as part of obesity prevention and reduction programs may enhance their effects. Given the relatively weak effects of most obesity interventions, it could be worthwhile to broaden the scope by addressing how parents communicate with, manage, and support their children's development over and

beyond specifically targeting diet and activity patterns. These hypotheses should be tested in future research.O

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