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Demographic, Physical, and Behavioral Characteristics  
Associated with TV Parenting Practices  
Among Latino Parents of Preschool Children

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**Abstract**

Demographic, Physical, and Behavioral Characteristics  
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**Introduction:** Latino children are disproportionately affected by obesity. Television (TV) viewing is linked with childhood obesity, decreased physical activity levels, and increased sedentary time. Valkenburg's TV Parenting Practices (TVPP) scale characterizes parental mediation of children's TV viewing. This study assesses what social, cultural, and demographic variables are associated with TVPP in a population of Latino parents of preschoolers.

**Methods:** Latino preschoolers (n=89) were recruited from several Head Start centers in the Houston area. Socio-demographics, anthropometrics, acculturation, neighborhood disorder, and TV viewing were measured. Actigraph GT1M accelerometers measured physical activity. Multiple linear regression was used with TVPP as the dependent variables.

**Results:** Social co-viewing and average daily hours of TV viewing were positively and significantly associated ( $\beta= 0.23$ ,  $p=0.046$ ) and restrictive mediation scores were significantly and negatively associated with child gender ( $\beta= -.23$ ,  $p=0.041$ .) that is, parents of girls used restrictive mediation less frequently than parents of boys. Instructional mediation scores were not associated with any of the baseline characteristics or average hours of TV viewing.

**Conclusion:** Well-designed, culturally competent interventions are needed to help decrease the prevalence of overweight, obesity, and associated poor health outcomes in Latino children in the US. TVPP, particularly restrictive mediation and social co-viewing, represent a key target for overweight and obesity-prevention programs in this population.

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## INTRODUCTION

One third of children in the US are overweight or obese.<sup>1</sup> Obesity in childhood is a strong predictor of obesity later in life, which is associated with a host of health problems, including diabetes, hypertension, dyslipidemia, osteoarthritis, and asthma.<sup>2,3</sup> The link between television (TV) viewing and childhood obesity is long established.<sup>4,5</sup> For young children, time spent watching TV is a significant predictor of BMI, and increases in strength as a predictor as children age.<sup>6,7</sup> There are several plausible mechanisms by which TV viewing contributes to childhood obesity, such as altered dietary habits, particularly snacking behavior, increased exposure to food advertising, altered sleep patterns, increased sedentary time, and decreased physical activity.<sup>8</sup> TV viewing behaviors are established in early childhood, and these patterns persist as children age.<sup>9,10</sup>

Given the link between screen time, less physical activity, and greater risk of childhood obesity, as well as the young age at which TV viewing behaviors are established, national guidelines on screen-time and physical activity have been created to promote child health. The American Academy of Pediatrics recommends that children over the age of two years old view no more than two hours of quality screen time per day.<sup>8</sup> The US Department of Health and Human Services recommends that children aged six years and older get at least one hour of physical activity each day.<sup>11</sup> For preschool-age children, the National Association for Sport and Physical Education suggests that preschoolers should engage in at least 60 minutes of structured physical activity per day, and that they should also have 60 or more minutes of unstructured physical activity per day, i.e., at least two hours per day of physical activity.<sup>12</sup> International guidelines for physical activity in young children also emphasize a mixture of light and energetic activity, recommending at least 3 hours of physical activity total per day for preschoolers, a minimization of sedentary time, and viewing a maximum of one hour of electronic screen media per day.<sup>13-15</sup>

Given the variability in interpretation of guidelines and in measurement of physical activity in young children, it is difficult to assess the prevalence by which these guidelines are being met.<sup>16-</sup>

<sup>18</sup> However, evidence suggests that young children both fail to meet PA guidelines and exceed

screen-time guidelines.<sup>19-21</sup> Even when children meet or exceed national and international guidelines for physical activity, TV viewing time remains significantly inversely associated with PA time.<sup>22</sup>

In 1990, it was estimated that by the time an American child reached 18 years of age, they would have spent more time watching TV than in any other activity but sleeping.<sup>10</sup> With the development and proliferation of smartphones, tablets, computers, and video games, and with near-universal access to television, young children are now growing up in a completely electronic media-saturated environment. Even with so many electronic media choices, TV viewing remains the dominant choice among US children 0-8 years of age.<sup>23</sup> Understanding and mitigating the impact of this constant exposure remains a pressing problem in public health.<sup>21</sup>

The prevalence of childhood overweight and obesity in the US varies dramatically by ethnicity and race.<sup>1,24</sup> Latino children consistently experience higher, and often, the highest rates of overweight and obesity. This disparity is observed as early as age two.<sup>1,25,26</sup> This higher prevalence of overweight and obesity, accompanied by risk factors such as inadequate physical fitness levels, imbalanced diets, and a family history of diabetes, puts Latino children at greater risk of type 2 diabetes mellitus (T2DM) and other negative health outcomes.<sup>27</sup> The inverse relationship between socioeconomic status (SES) and poor health outcomes is well documented. Relative to non-Latino whites, Latinos in the US have a lower SES.<sup>28</sup> Latino immigrants to the US have a relatively low prevalence of obesity upon arrival, and this prevalence almost triples after 15 years of residency in the US.<sup>29</sup> This increase suggests that acculturation and the adoption of unhealthy lifestyle behaviors—including excessive TV viewing— may contribute to the high prevalence of overweight and obesity in Latinos in the US, including children. For example, increased maternal acculturation levels in a Latino sample were associated with higher non-traditional food consumption by young children, and with higher child BMI percentiles.<sup>30</sup> However, acculturation in a similar Latino population was found to have no significant association with childhood overweight and obesity rates.<sup>31</sup> Positive associations between low levels of maternal acculturation and Latino child BMI have also been described.<sup>32</sup> These mixed findings demonstrate the complexity of the relationship between acculturation status and childhood overweight and obesity in this population, and may in part stem from failing to

account for the diversity between different population subgroups, each having their own cultural background and distinct migration status.<sup>30</sup>

Although the association between acculturation status and childhood obesity may not be consistent in this population, the associations between TV viewing, physical activity and children's weight status are more consistent. Children who watch more TV are more likely to be overweight.<sup>31,33</sup> In Latino preschoolers, maternal perceptions of neighborhood disorder, which are associated with greater child TV viewing,<sup>34</sup> are positively associated with their child's BMI z-score, while the child's physical activity level is negatively associated with their BMI z-score.<sup>35</sup> Positive maternal perceptions of neighborhood safety are associated with more hours of outdoor play, fewer hours of television viewing, and more trips to a park or playground.<sup>33</sup> Children from ethnic-immigrant groups, including Latino children, have higher rates of sedentary time and are more likely to watch excessive amounts of television than other children.<sup>36</sup> Acculturation status and perceptions of neighborhood safety likely contribute to this.<sup>37</sup>

Parenting practices, e.g. parental beliefs, behaviors, skill, and strategies, play an important role in both promoting and preventing childhood obesity. As such, they have been the target of numerous obesity-intervention studies in preschool populations.<sup>38</sup> Several obesity-prevention interventions have been developed specifically for Latino children, with variable success.<sup>39,40</sup> The more successful of these interventions were based on behavioral theory and included a parental component.<sup>40</sup> As the primary method by which Latino parents try to encourage their children to be more active is by restricting TV and other screen media, TV parenting practices are a key target for intervention in this population.<sup>41</sup>

Research on TV parenting practices, or parental mediation of television viewing, was originally the purview of communication scientists, although given the strength of the link between television viewing and childhood obesity, assessments of TV parenting practices are now becoming more common in medical and public health literature.<sup>42</sup> Many of the measures of parenting practices were developed among non-Latino populations and may function differently on the basis of parental education level, acculturation, and child age.<sup>42,43</sup> Parenting practices for

media use are influenced by child age, developmental stage, availability of media in the home, parental beliefs and attitudes, and cultural norms—and the effect of ethnicity on parenting practices surrounding screen media are poorly understood.<sup>42,44</sup> Moreover, parenting practices in one domain (e.g., television mediation) are likely to affect practices in other domains (e.g., physical activity).

From numerous early studies and models of parental mediation of TV-viewing, Valkenburg et al identified three distinct and measurable TV parenting practices: Social Co-Viewing, where parents and children watch TV together with no purpose but enjoyment; Instructional Mediation, where parents provide explanations or discuss elements of TV programming; and Restrictive Mediation, where parents set rules regarding acceptable program content and viewing duration.<sup>45</sup> However, as the relative frequency of use of these parental TV mediation styles has varied widely across population groups, as have the demographic, behavioral, and social characteristics associated with each style, it is difficult to identify universal associations of each TV parenting practice:

In Valkenberg's original study, social co-viewing was shown to be associated with an overall greater amount of TV viewing by children<sup>45</sup> but this has not been consistently observed.<sup>46,47</sup> Instructive and restrictive TVPP are more commonly used by parents of younger children, due in part to concerns over exposure to age-inappropriate content.<sup>45,46,48</sup> Parents of preschoolers use restrictive mediation most frequently, and social co-viewing least frequently.<sup>46</sup>

Greater levels of parental education have been shown to increase frequency of use of both instructive and restrictive mediation in some samples,<sup>45</sup> but co-viewing in others.<sup>47</sup> Restrictive mediation requires less time and effort than instructional or co-viewing TVPP, and it is possible that parental educational level is functioning as an imperfect proxy measure for parental availability in some studies.<sup>46,49</sup> Interestingly, restrictive mediation is consistently *not* significantly associated with decreased TV-viewing hours by children. Additionally, no clear relationship between parental or child gender and TVPP has been observed.<sup>45,46,49</sup>

Associations between TVPP and child physical activity levels remain largely unexplored. Restrictive mediation has been shown to be associated with greater sedentary time and less physical activity in older children.<sup>50</sup> However, research on associations between parental outcome expectations and TVPP shows that parental concerns that TV-viewing may replace other activities, including physical activities, are significantly negatively associated with social co-viewing.<sup>48</sup>

No study to date has examined TVPP in an exclusively Latino population of preschoolers. Given the gaps in our understanding of TV parenting practices among Latino populations, as well as the early age at which TV viewing habits are established, the purpose of this study is to understand how TV parenting practices are associated with physical characteristics and behaviors (e.g. adiposity, physical activity, and TV viewing,) and demographic and social characteristics (e.g. child gender, parent acculturation status, and perceptions of neighborhood disorder) in a group of Latino preschoolers and their parents.

Well-designed, culturally competent interventions are needed to help decrease the prevalence of overweight, obesity, and associated poor health outcomes in Latino children in the US.<sup>39,40,51</sup> Parenting practices, particularly media-related parenting practices, represent a key target for overweight and obesity-prevention programs,<sup>40,41,52</sup> and this work will thereby help inform the design of TV reduction interventions to reduce risk of obesity in this high risk population.

## METHODS

### *Participants:*

This study is a secondary analysis using data from a randomized controlled trial of a TV reduction pilot study, and recruitment details are published elsewhere.<sup>53</sup> Briefly, Latino preschoolers aged 3-5 years were recruited from six Head Start centers in the Houston-metro area with  $\geq 75\%$  Latino student enrollment. Data collection took place between 2010 and 2012, with two-to-four classrooms recruited and randomized to control or intervention groups at the

start of each fall and spring semesters. For 15-30 minutes per school day over a 7-8 week period, intervention classrooms were taught a culturally adapted Fit 5 Kids curriculum by a study staff member, while control classrooms were taught the usual Head Start curriculum by a Head Start teacher, which did not specifically include reducing TV viewing. Measurements were taken at Time 1, one-to-two weeks prior to the start of the intervention, and at Time 2, immediately following the intervention period.<sup>53</sup>

Inclusion criteria for the present study were parental completion at Time 1 of the TV Parenting Practices survey, a demographic survey, a neighborhood disorder (safety) scale, and a 7-day TV viewing diary, as well as collection of child anthropometric and objective physical activity data by trained study staff. Parents of participants provided written informed consent, which was offered in English and Spanish. The original study was approved by the Institutional Review Board for Baylor College of Medicine and the present study was approved by the Institutional Review Board of Seattle Children's Hospital.

*Instruments:*

Parental mediation of children's TV viewing was assessed using a 15-item survey, the TV Parenting Practices (TVPP) Survey. This scale was originally developed and validated in a sample of Dutch parents of five-to -twelve-year-old children (with reported Cronbach's alphas of .79 for social co-viewing, .80 for instructive mediation, and .78 for restrictive mediation). Principal components analysis was used to reduce a 30-item questionnaire representing both old and new approaches to classifying television mediation into a 15-item scale. The three-factor solution of social co-viewing, instructive, and restrictive mediations explained 55.6% of variance in the model.<sup>46</sup>

This scale has since been validated in and used to assess the TV mediation practices of American parents of preschool and school-aged children, with good internal consistency reported across varied demographic groups: In a predominantly non-Latino white parents of elementary school-aged children, Cronbach's alphas for the scale were .83 for social co-viewing, .96 for instructive mediation, and .84 for restrictive mediation.<sup>46</sup> The scale has also been used and validated in

school-age US students (13% Latino),<sup>50,54</sup> with reported Cronbach's alpha of 0.87 for social co-viewing, 0.81 for instructional mediation, and 0.86 for restrictive mediation.<sup>50</sup>

For the TVPP, participants chose how frequently (never, rarely, sometimes, or often) they used a specific parenting practice, with each item on the scale corresponding to one of three specific mediation styles: Social Co-Viewing, where parents and children watching TV together with no purpose but enjoyment; Instructional Mediation, where parents provide explanations or discuss elements of TV programming; and Restrictive Mediation, where parents set rules regarding acceptable program content and viewing duration.<sup>45,46</sup>

The TVPP survey has also specifically been validated for use in Spanish-speaking populations: In a predominantly Latino population of children 3 to 12 years of age, the TVPP subscales demonstrated factorial validity and acceptable internal consistency reliability when assessed with differential item functioning analysis, e.g. testing whether TVPP scale item parameters differed across education, language, and age groups.<sup>43</sup>

Anthropometric data was collected by trained research staff, who measured participants' standing height and body weight using a portable stadiometer (Seca model 214, Birmingham, UK) and a digital scale (Tanita model BWB-800s, Arlington Heights, IL). The average of two measures was calculated and used for analyses, unless there was a difference of >0.2 cm or 0.2 kg. In these instances, a third measurement was taken and the two closest values were averaged and used for analyses. Age and gender-specific BMI z-scores were determined for children per CDC growth charts.<sup>55</sup>

Parent and child acculturation were determined by parental completion, in English or Spanish, of a demographic survey that included proxy items on acculturation: 1) country of birth (non-US including Puerto Rico = 0 and US = 1); 2) years living in the USA (Parents: < 15 years = 0 and ≥ 15 years = 1; Children: < 4 years = 0 and ≥ 4 years = 1); and 3) preferred language (Spanish only/more than English = 0, English and Spanish equally or English more than Spanish = 1). Child and parent acculturation items were summed separately to provide 2 global measures used in analyses. Higher scores indicated greater acculturation.<sup>35,56</sup>

An eight-item survey was used to measure parental perceptions of their neighborhood's safety, including questions on violence, drug trafficking, and child victimization.<sup>57</sup> Previous studies have shown that this scale is a reliable and valid measure of neighborhood disorder (Cronbach's alpha = 0.95)<sup>57</sup> including in predominantly Latino neighborhoods (Cronbach's alpha = 0.87).<sup>35</sup> Higher scores indicated greater neighborhood disorder and were associated with higher BMI z-scores as hypothesized among a Latino preschool sample.<sup>35</sup>

TV diaries were used to measure the preschool participants' TV viewing. One-to-two weeks prior to the start of the study, for seven consecutive days, parents of participants recorded when their children watched TV or videos by marking off 15 minute increments representing the time from 6 am to 12 midnight. TV diaries provide a valid measure of child TV-viewing time, correlating the highest among field-based methods with the criterion standard of video taped or directly observed measurement of TV viewing ( $r=0.84$ ).<sup>58</sup> An adapted TV diary, available in English and Spanish, was developed specifically for use in Latino populations, and has also shown good reliability (ICC = 0.82,  $p < 0.001$ ) and convergent validity with the TV Allowance electronic device and ecological momentary assessment ( $r=0.45-0.55$ ,  $p < 0.001$ ) among Latino preschoolers.<sup>59</sup> This adapted TV diary was used for the present study.

Children wore accelerometers (GT1M accelerometer, Actigraph LLC, Ft. Walton Beach, FL,) recording in 15-second epochs, over 7-days to provide a valid objective measure of physical activity<sup>60,61</sup> and sedentary time.<sup>62</sup> Accelerometers were worn daily over the hip, with three or more hours of accelerometer wear per day for a minimum of five days set as the threshold for valid wear time and inclusion in analyses.<sup>17,63</sup> Non-wear time was defined as 60 consecutive minutes of zero accelerometer counts, except for 1-2 minutes of counts of 1-100.<sup>64</sup> Activity measured at  $>37.5$  counts/15 seconds defined light-to-vigorous physical activity (PA) threshold,<sup>65</sup> and all activity below that threshold was considered sedentary behavior. We chose to examine sedentary time since TV viewing is a major form of sedentary behaviors among children.

*Statistical Analyses:*

Cronbach's alpha measured the internal consistency reliability of the TVPP Survey responses for the full sample at Time 1, and Pearson correlations measured test-retest reliability between mean TVPP Survey scores of the control group at Times 1 and 2 (7-8 weeks apart).

We used multiple linear regression analysis to determine associations between TVPP scales and participant characteristics, with TVPP scales for social co-viewing, instructional viewing, restrictive viewing, and a total TVPP score as the dependent variables. The total TVPP score represents the sum of parental practices that promote TV-viewing in children, and was created by adding the social co-viewing, instructional viewing, and a reverse-coded restrictive viewing score (to account for the opposing directionality of this score relative to the others) together. Covariates in the models included child gender, age, and BMI z-score, parental BMI, perception of neighborhood disorder, and acculturation status as independent variables. Average daily hours of child TV viewing, average hours of daily sedentary time, and average hours of daily physical activity were included as covariates in separate independent regression models.

We used STATA 12.1 (Statacorp LP, College Station, TX) for statistical analyses. Standardized beta coefficients, representing the number of standard deviations the dependent variable will change for each single standard deviation change in the independent variable, are presented for ease of comparison. A significance level of  $p < 0.05$  was chosen, but results with  $p < 0.1$  are noted as they may be of potential interest for further investigation in future studies.

## RESULTS

The average child's age ( $n=89$ ) was  $4.5 \pm 0.05$  years, the majority were of low socioeconomic status (73% of their parents had a high school education or less), and all children were born in the US. For the study, mothers (99.4%) were the primary respondent. Most responding parents were born in Mexico (70.8%) and the US (21.3%). Other demographic and baseline data are listed in Table 1.

**Table 1 Participant Characteristics for TV Parenting Practices**

	n	%
Child Gender		
<i>Male</i>	43	48.3%
<i>Female</i>	46	51.7
Parent Gender		
<i>Male</i>	5	0.06
<i>Female</i>	84	94.4
Child Acculturation Status Score		
0 ( <i>least accultured</i> )	0	0.0
1	11	12.4
2	57	64.0
3	21	2.4
Parent Acculturation Status Score		
0 ( <i>least accultured</i> )	49	55.1
1	19	21.3
2	5	5.6
3	16	18.0
Parent Education Level		
<i>8<sup>th</sup> grade or less</i>	41	46.0
<i>Some HS</i>	24	27.0
<i>Completed HS</i>	13	14.6
<i>Some Post-HS education</i>	11	12.4
Parent Country of Birth		
<i>United States</i>	19	21.3
<i>Puerto Rico</i>	1	1.1
<i>Mexico</i>	63	70.8
<i>El Salvador</i>	3	3.4
<i>Other</i>	3	3.4
Child Country of Birth		
<i>United States</i>	89	100
	n	Mean ± SD
Child age	89	4.5 ± 0.05
TV viewing (hours/day)	89	1.41 ± 0.12
Physical activity (hours/day)	89	5.04 ± 0.10
Sedentary time (hours/day)	89	6.8 ± 0.13
Child z-score	89	0.57 ± 0.12
Parental BMI	89	28.8 ± 0.63
Neighborhood Disorder Score*	89	12.7 ± 0.46

\*Higher scores indicated higher neighborhood disorder (range: 8-24)

The internal consistency reliability for the TVPP scales reported at Time 1 were good: Cronbach's alphas for social co-viewing, instructional mediation, and restrictive mediation were 0.79, 0.84, and 0.79, respectively.

Test-retest reliability of the TVPP Survey was acceptable. Subscale scores at Time 1 and Time 2 for the control group were positively correlated, with  $r=0.74$  for social co-viewing scores,  $r=0.82$  for instructional mediation scores, and  $r=0.74$  for restrictive mediation scores,  $p<0.05$ . Total TVPP scores at Time 1 and Time 2 were also positively correlated,  $r=0.84$ ,  $p<0.05$ .

The mean Social Co-viewing score in this population was  $16.3 \pm 2.7$ , the mean Instructional Mediation score was  $16.0 \pm 2.9$ , and the mean Restrictive Mediation Score was  $16.0 \pm 3.4$ . These means can be interpreted as measures of the frequency by which parents use each mediation style; in this sample, no significant differences in frequency of use were observed.

Multiple linear regression model results are shown in Tables 2-4. Model 1, which included child TV viewing hours, showed several significant associations between TVPP Survey scores and participant characteristics: Social co-viewing scores and average hours of TV viewing per day were positively and significantly associated ( $\beta = 0.23$ ,  $p = 0.046$ ), that is, greater hours of TV viewing were associated with greater social co-viewing mediation frequency. There was also a positive association between the social co-viewing score and child BMI z-score ( $\beta = .18$ ) but this did not meet significance ( $p = 0.094$ ). Restrictive mediation scores were significantly and negatively associated with child gender ( $\beta = -.23$ ,  $p = 0.041$ ). In this model, male children were considered the referent group, thus parents of female children had a mean restrictive viewing score that was 0.23 units less on average than parents of male children. This represents a small but significant decreased frequency of restrictive mediation among parents of girls. The Total TVPP score was again positively associated with child BMI-z score, however this did not reach significance ( $\beta = 0.18$ ,  $p = 0.094$ ). Instructional mediation scores were not associated with any of the baseline characteristics or average hours of TV viewing.

The multiple linear regression model that included sedentary time (Table 3) showed only one significant association between TVPP scores and participant characteristics: Restrictive mediation scores were again significantly and negatively associated with child gender ( $\beta = -0.23$ ,  $p = 0.036$ ), with parents of female children having a mean restrictive viewing score that was 0.23 units less on average than parents of male children in this model. This again represents a small but significant decreased frequency of restrictive mediation among parents of girls. The Total TVPP score was again positively associated with child BMI-z score, however this did not reach significance. ( $\beta = 0.18$ ,  $p = 0.098$ ). No other associations between the TVPP Survey scores, baseline characteristics, or mean hours of sedentary time were observed.

**Table 2. Linear Regression Models Examining Associations between TVPP Scores, Participant Characteristics, and TV Viewing time**

*R<sup>2</sup>= 0.0744, 0.0348, 0.0839, 0.0751 respectively*

Variable	Co-Viewing Score (n=89)	Instructional Mediation Score (n=89)	Restrictive Mediation Score (n=89)	Total TVPP Score (n=89)
	$\beta$	$\beta$	$\beta$	$\beta$
Child Gender	0.092	-0.11	-0.23**	0.15
Child Age	-0.11	0.062	0.0080	-0.030
Parent BMI	0.014	-0.094	-0.059	-0.0081
Child Z-Score	0.11	0.063	-0.11	0.18*
Neighborhood Disorder	-0.0023	0.043	0.078	-0.031
Parent Acculturation	-0.0021	0.064	0.10	-0.034
TV Viewing (hours/day)	0.23**	0.20	-0.0026	0.15

\* P <.1, \*\*P<.05, \*\*\*P<.01

**Table 3. Linear Regression Models Examining Associations between TVPP Scores, Participant Characteristics, and Sedentary Time**

*R<sup>2</sup>= 0.0289, 0.0356, 0.0964, 0.0708*

Variable	Co-Viewing Score (n=89)	Instructional Mediation Score (n=89)	Restrictive Mediation Score (n=89)	Total TVPP Score (n=89)
	$\beta$	$\beta$	$\beta$	$\beta$
Child Gender	0.058	-0.11	-0.23***	0.13
Child Age	-0.076	0.065	0.0058	-0.0083
Parent BMI	0.035	-0.091	-0.061	0.0074
Child Z-Score	0.12	0.061	-0.10	0.18*
Neighborhood Disorder	0.019	0.051	0.055	0.0036
Parent Acculturation	0.038	0.068	0.10	-0.0084
Sed time (hours/day)	0.042	0.35	-0.11	0.13

\* P <.1, \*\*P<.05, \*\*\*P<.01

**Table 4. Linear Regression Models Examining Associations between TVPP Scores, Participant Characteristics, and Physical Activity Time**

*R<sup>2</sup>= 0.0277, 0.0348, 0.0905, 0.0555*

Variable	Co-Viewing Score (n=89)	Instructional Mediation Score (n=89)	Restrictive Mediation Score (n=89)	Total TVPP Score (n=89)
	$\beta$	$\beta$	$\beta$	$\beta$
Child Gender	0.049	-0.12	-0.26***	0.14
Child Age	-0.074	0.067	0.019	-0.016
Parent BMI	0.037	-0.089	-0.048	-
				0.00018
Child Z-Score	0.13	0.066	-0.10	0.19
Neighborhood Disorder	0.010	0.044	0.074	-0.021
Parent Acculturation	0.039	0.069	0.10	-0.0073
PA time (hours/day)	-0.022	-0.020	-0.90	0.040

\* P <.1, \*\*P<.05, \*\*\*P<.01

Similarly, the multiple linear regression model that included physical activity time (Table 4) showed only one significant associated between TVPP scores and participant characteristics: Restrictive mediation scores were again significantly associated with child gender ( $\beta = -0.26$ ,  $p = 0.028$ ), with parents of female children having a mean restrictive viewing score that was 0.26

units less on average than parents of male children in this model, again representing a small but significant decreased frequency of restrictive mediation among parents of girls. The Total TVPP score was again positively associated with child BMI-z score, however this did not reach significance. ( $\beta = 0.19$ ,  $p = 0.082$ ). No other associations between the TVPP Survey scores, baseline characteristics, or mean hours of physical activity were observed.

## DISCUSSION

Several associations between TVPP scores and participants' physical and behavioral characteristics were observed in this study. Although the usefulness of demographic variables in predicting TVPP has been debated in populations of parents of older children,<sup>47,49</sup> they are considered more relevant for parents of preschoolers.<sup>46</sup> Our findings support this postulation because child gender was a significant predictor of using restrictive mediation practices across all models. These findings are consistent with findings in some populations,<sup>46</sup> but not in others.<sup>45</sup> Gender is a known predictor of differential parenting practices in this population: disparities in physical activity levels in Latino preschoolers has also been observed, with boys being more active than girls.<sup>66</sup>

Given that >94% of responding parents in our sample were mothers, we were unable to observe a role of parental gender as a predictor of TV parenting practices. Valkenberg found that mothers engage in instructive mediation more frequently than fathers.<sup>45</sup> However, this difference may be a proxy of parental availability, e.g. mothers are more often the primary caregiver, and may have more time in which to provide instructive mediation.<sup>46,49</sup>

A major strength of this study was the inclusion of cultural and behavioral factors as potential predictors of TV parenting practices, in addition to demographic factors. Although The TVPP scale has not been used in a population of exclusively Latino parents of preschoolers, there is qualitative work discussed below on parental practices and perceptions within this population that informed these choices.

Parental perceptions of neighborhood safety in this population are significantly associated with physical activity parenting practices.<sup>37</sup> An association between perceived neighborhood disorder and child adiposity has also been demonstrated in Latino preschoolers.<sup>35</sup> However, perceived neighborhood disorder was not a significant predictor of TVPP in this sample.

Similarly, parental attitudes, e.g., watching TV has educational benefits for children, have been shown to influence parenting practices.<sup>67</sup> In one qualitative study, low-income Latino mothers of preschoolers identified the educational value of TV programming, in that it particularly promoted language-learning, as well as pro-social behaviors.<sup>68</sup> Given this, a role for acculturation level as a predictor of TVPP in this population seemed plausible, although no such effect was observed in this sample.

The body of qualitative research regarding the beliefs and attitudes of Latino parents of young children also informed the inclusion of sedentary and physical activity time as possible predictors. Although the TV parenting practices scale does not address these behaviors directly, associations between TVPP and PA have been observed: In one study, frequency of restrictive mediation was associated with greater sedentary time and less physical activity.<sup>37</sup> This is an unexpected finding. However, one possible explanation may be that restrictive viewing is the easiest TVPP in that it requires less time and parental effort than co-viewing or instructive mediation.<sup>49</sup> Reducing sedentary time and promoting physical activity are proactive parental behaviors, and this finding may be mediated in part by parental availability, that is, restrictive mediation in this example may be representative of less proactive parenting in general.

Restrictive viewing was not associated with decreased TV viewing hours in this sample, which is consistent with previous findings.<sup>45,47</sup> Concerns about exposure to age-inappropriate TV content appear consistently as a primary motivation for restrictive mediation for parents of young children, both in studies using the TVPP scale<sup>45,46</sup> and in qualitative research in Latino parent populations<sup>48,69</sup> In one study, participants spoke less frequently about the amount of time their children spent watching TV, compared to concerns over the type of content they viewed. And although some participants expressed concern over excessive TV viewing, few endorsed establishing strict time restrictions.<sup>68</sup> Altogether this suggests that in this population, frequency

of restrictive mediation is indeed motivated primarily by parental desire to limit inappropriate content, with reduction of TV viewing time as a secondary motivator.

Another explanation for the apparent disconnect between restrictive mediation frequency and the hours of TV viewed by children again involves the concept of parental access or availability, and the corresponding ability for parents to be proactive. Warren recognized that parental mediation is in part a function of parents and children engaging in shared activities, and that a lack of “together time” results in less enforcement of viewing rules, or that there can be a division between parental “words” and “deeds.”<sup>47,49</sup>

Warren identified difficulty balancing work and family life as a major barrier to enforcing rules.<sup>47</sup> Qualitative work on parental beliefs and outcome expectations within Latino parent populations echo this finding: TV-viewing is viewed positively as an opportunity for parents to do work, chores, and relax, while keeping a child entertained and occupied.<sup>48,69</sup> This then represents a key focus for future TV-reduction interventions in this population: emphasizing *how*, practically, to limit TV and screen-time, and not just *why*.

Our findings that social co-viewing are significantly associated with hours of TV-viewed are also in line with previous research.<sup>45,48</sup> There is evidence to suggest that social co-viewing can positively impact children, providing a sense of family togetherness and insight into human relationships.<sup>70</sup> Given a preschooler's developmentally limited ability to decipher TV, the passive parental guidance provided by social co-viewing can be beneficial.<sup>46</sup> However, given the well-established link between increased TV viewing and childhood obesity, this persistent positive association between hours of TV viewed and frequency of social co-viewing suggests that social co-viewing may not be the most beneficial TV mediation strategy. The trend of a positive association between total TVPP score and child z score, while accounting for hours of TV viewed, similarly implies that effects of these styles of TV mediation are complex, and likely bi-directional, as observed with other parenting practices.<sup>50</sup> Although this trend did not reach significance in this sample, the idea of TVPP having both positive and negative outcome effects should be explored in future studies.

Additionally, current research on social co-viewing has identified different viewing patterns between weekends and weekdays. Social co-viewing parenting has been shown to be directly positively associated with children's TV viewing on weekends, but not weekdays, suggesting that parenting practices may have a greater impact on weekend TV viewing.<sup>48</sup> This further supports Warren's assessment that parental access and availability mediate their use of TVPP<sup>49</sup>, and although no distinction was made between weekday and weekend TV viewing in these analyses, this should be considered in future use of the TVPP scale in this population.

No baseline characteristics were associated with instructional viewing scores, in any of the linear regression models. This may be due in part to the limited variation in parental educational level—higher parental education is typically associated with increased instructional mediation practices, and the majority of parents in this population had a high-school level education or less.<sup>45</sup> However, a more likely explanation is that complex discussions of TV programming are not possible or indicated with young children, and so instructional mediation is not as frequently used.<sup>46</sup>

Beyond inclusion of relevant behavioral and cultural characteristics, this study had several strengths. We used objective accelerometry and anthropometric measurements when determining associations between TVPP scores and participants characteristics. We further demonstrated that this survey tool is reliable and valid in Spanish-speaking Latino populations, particularly Latino parents of preschoolers. The associations we observed between participant characteristics and TVPP have implications for the development of future TV-reduction interventions within this population, especially when considered in the context of current qualitative research findings.

However, this study did have limitations. TV viewing data was collected, but other forms of screen media, such as tablets, smartphones, and computers, were not considered. Computer use alone in preschoolers is associated with higher adiposity.<sup>20</sup> Future research on the relationship between TV parenting practices and other forms of screen media is warranted.<sup>50</sup> Interestingly, many children in this study met current US guidelines for hours of physical activity per day and mean hours of TV viewed per day, which may limit the generalizability of these results.

## CONCLUSION

This study confirms the validity and reliability of the TV parenting practices survey within a population of Latino parents of preschoolers, identifies significant links between these TVPP and participant characteristics, and indicates considerations for future research on TVPP in this population. As successful obesity-prevention interventions in this population include parental components, developing a further understanding of how parents use TV mediation style and what predicts these practices is necessary to inform both the design and implementation of future interventions.

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