

# Early Childhood Risk Factors for Mealtime TV Exposure and Engagement in Low-Income Families

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## ABSTRACT

**OBJECTIVE:** To identify whether child and mother characteristics in early childhood predict TV exposure and engagement during mealtime in middle childhood.

**METHODS:** A total of 220 low-income mother-child dyads participated. Children were 4.26 years old (SD = 0.51) at baseline and 5.94 years (SD = 0.68) at 2-year follow-up. Mothers completed baseline measures of child negative emotionality and parenting practices. Family mealtimes were video recorded and coded for background TV exposure and child TV engagement. Multinomial logistic regression tested whether child emotionality and parenting practices during early childhood predicted risk of child TV exposure or engagement during mealtime, relative to no TV use, 2 years later.

**RESULTS:** Children with greater negative emotionality in early childhood were more likely to engage with TV during mealtime

than to have no TV. Similarly, early parenting disciplinary practices characterized by over-reactivity and laxness increased the risk for child TV engagement versus no TV during mealtime approximately 2 years later.

**CONCLUSIONS:** We identified 2 factors that associated with an increased risk for TV viewing during meals. Helping parents manage child negative emotionality using positive parenting strategies might reduce later child TV engagement and improve the quality of family mealtimes.

**KEYWORDS:** emotion regulation; longitudinal studies; mealtime; parenting; pediatric obesity; screen time; television

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## WHAT'S NEW

Child negative emotionality as well as dysfunctional parenting practices (ie, over-reactivity, laxness) in early childhood predicted an increased risk for child TV engagement during mealtime (relative to no TV during mealtime) 2 years later. Families with these risk factors could be identified early to prevent unfavorable mealtime practices.

FAMILY MEALTIME IS a salient context for promoting child and family health. Shared family mealtimes have been linked to better child health outcomes, including higher consumption of healthy foods, lower consumption of unhealthy foods, and healthier eating patterns.<sup>1</sup> Recent longitudinal research has shown that frequency of family meals during childhood predicts reduced risk for obesity in adulthood.<sup>2</sup> Indeed, recommending that families share meals together each week is a key child health promotion message.

Despite the well documented importance of family mealtimes, TV and other electronic media use during

mealtime might compromise its potential benefits. For example, mealtime TV and other electronic media use is associated with poorer overall dietary quality of foods served at meals<sup>3</sup> and overall dietary intake.<sup>4</sup> To prevent unfavorable mealtime practices in childhood, it is essential that pediatricians identify, early in child development, which families might be at greater risk for TV use during mealtime. Identifying these early risk factors will enable tailoring of obesity prevention messages provided during well child visits.

Characteristics of children as well as their parents might play a role in family mealtime practices. Children with more challenging dispositions, for example, those prone to negative emotions and lability, might be more likely to be pacified with media during meals. Likewise, parents lacking effective discipline strategies might use TV to reduce conflict, or simply be more permissive with TV use during mealtime. Although child temperament and/or maternal factors as predictors of screen time in infants and young children has been examined in previous studies,<sup>5–7</sup> it is not yet known whether child negative emotionality or poorer parenting practices predict later

mealtime TV use in middle childhood. Another gap in the literature is that previous studies have used parent reports of screen time, whereas observational methods might provide a more nuanced picture of children's meal time TV exposure. In the current study we aimed to fill these gaps by examining whether early childhood factors predict observed child TV exposure and TV engagement during mealtime in middle childhood.

## METHODS

### PARTICIPANTS

Participants in this study were part of a longitudinal cohort of mother-child dyads recruited from Head Start locations to participate in a study of child eating behavior between 2009 and 2011 (see also Goulding et al<sup>8</sup>). This study was approved by the authors' institutional review boards; primary caregivers provided informed consent to participate. Inclusion criteria were: child aged 3 or 4 years at enrollment, birth without peri- or neonatal complications, no current medical or developmental problems, mother as well as child fluent in English, and child not currently in foster care. Child emotion regulation measures were completed at baseline and parenting practices were completed, on average, 0.63 years (SD = 0.48 year) later. Mothers were contacted approximately 2 years afterward (2011–2013) for participation in a follow-up study that measured family mealtime practices, during which time family meals were video recorded. The final sample at follow-up consisted of 301 mother-child dyads. Of these dyads, 251 (83.4%) had video recordings codable for TV exposure; 220 of these 251 families had no missing data for the baseline measures of suboptimal discipline practices and child emotion regulation at baseline (73.1%). Thus, the final analytical sample consisted of 220 parent-child dyads.

### PROCEDURE

Three typical dinnertime meals in the home were video recorded by mothers over a 1-week time span. Mothers were provided with a camera and instructions on how to do these recordings. Instructions were to record the entire meal and the child's upper body, and that the child's plate and drink should be in view throughout the video.

### OBSERVATIONAL CODING

The second dinnertime meal recorded was selected for coding. Trained research assistants coded each video in 10-second intervals indicating whether the TV was audible ("background TV exposure") and whether the child attended to the TV screen or not (ie, indicated whether eye gaze was directed toward television; "TV engagement"). The research assistants were trained to reach a reliability criterion of a least Cohen  $\kappa > 0.70$  ( $\kappa$  for background TV exposure = 0.88;  $\kappa$  for child TV engagement = 0.85). After achieving reliability (reached after coding 20 mealtime observations), the coders independently coded the remaining videos and double-coded 20% of videos to protect against coder drift. These interval codes were summed across the

meal and collapsed into 3 categories: 1) no TV exposure, 2) background TV exposure (ie, TV audible but no instances of child TV engagement), and 3) TV engagement (ie, child attended to TV at least once).

### MEASURES

Suboptimal discipline practices were measured using the Parenting Scale.<sup>9</sup> This scale measures lax and harsh parenting practices in the context of managing child behaviors. Items include, "When my child does something I don't like... I often let it go," "When I'm upset or under stress... I am picky and on my child's back," and "When my child misbehaves... I get so frustrated or angry that my child can see I'm upset." To get an overall score of dysfunctional parenting practices, we took the mean of all items (22 items;  $\alpha = 0.82$ ). Response options ranged from 1 to 7, with higher scores reflecting poorer parenting practices.

Child negative emotionality was measured using the Emotion Regulation Checklist Lability/Negativity subscale,<sup>10</sup> which was also completed by the mother. Items on this scale include: "is prone to angry outbursts, tantrums easily" and "responds angrily to limit-setting by adults." Response options ranged from 1 (rarely/never) to 4 (almost always). The mean of the items on the Lability/Negativity subscale was calculated, with higher scores indicating greater negative emotionality. This scale evidenced good reliability in the current study (16 items;  $\alpha = 0.85$ ) and correlated with suboptimal discipline practices at  $r = 0.13$  ( $P < .05$ ).

### DATA ANALYSIS

To test whether early childhood negative emotionality and discipline practices predicted relative risk for: 1) background TV exposure, and 2) child TV engagement during mealtime compared with no TV exposure (reference category), we conducted a multinomial logistic regression, adjusted for child sex (coded as male = 1; female = 2), child age, child race/ethnicity, and maternal education level (0 for high school degree/GED or less education and 1 for more than high school degree/GED). Negative emotionality and suboptimal discipline practices were entered in the same model as the independent variables. We chose the reference category of no TV exposure because previous research has indicated that background TV as well as TV engagement might have negative effects on child health.<sup>11</sup> As such, we were interested in whether these 2 separate TV use variables were predicted by early childhood factors.

## RESULTS

### SAMPLE CHARACTERISTICS

See Table 1 for demographic characteristics of the sample. Half of the children in the sample did not have the TV on during mealtime. Approximately 21% of children had background TV exposure. The remaining proportion of children had TV engagement (28.6%); on average, this proportion of children engaged with TV during 43% of their

**Table 1.** Demographic Characteristics of Participants

Demographic Variable	Mean (SD) or % (n)
Child age at baseline, years	4.26 (0.51)
Child age at follow up, years	5.94 (0.68)
Child sex (female)	46.4% (102)
Child race/ethnicity	
White, non-Hispanic	51.4% (113)
Black, non-Hispanic	17.7% (39)
Hispanic	12.7% (28)
Other, non-Hispanic	18.2% (40)
Mother race/ethnicity	
White, non-Hispanic	65.9% (145)
Black, non-Hispanic	17.3% (38)
Hispanic	8.6% (19)
Other, non-Hispanic	8.2% (18)
Mother education level	
High school diploma/GED or less	48.6% (107)
More than a high school diploma	51.4% (113)
Child TV exposure/engagement level	
No TV exposure	50.0% (110)
Background TV exposure	21.4% (47)
Child TV engagement	28.6% (63)

GED indicates general equivalency diploma.

coded mealtime intervals (SD = 33.7%). No significant differences in demographic variables or baseline measures of interest were found between participants with baseline only data versus participants with family mealtime observations at the second wave.

### PREDICTING TV EXPOSURE AND ENGAGEMENT

Using the multinomial logistic regression we examined whether negative emotionality and suboptimal discipline practices were associated with increased risk for TV exposure during mealtime, relative to the reference category of no TV exposure. Neither factor predicted an increased risk for background TV exposure. However, child negative emotionality as well as suboptimal discipline practices independently predicted a greater risk for the child to engage with TV during mealtime compared with no TV exposure (Table 2). Children higher in negative emotionality at preschool were more likely to engage with TV (ie, direct their attention to TV) than to have no TV exposure during mealtime later in childhood. A 1-unit increase in negative emotionality was associated with a 2.11 times increase in risk of engaging with TV versus no TV during

mealtime later in childhood. Children of mothers who used suboptimal discipline practices when their child was younger (eg, being too lax and over-reactive), had a greater risk of engaging with TV during mealtime relative to no TV exposure during mealtime (relative risk ratio = 1.6; 95% confidence interval, 1.02–2.51). There was no interaction between suboptimal parenting and child negative emotionality on risk of TV engagement versus no TV exposure.

### DISCUSSION

The objective of this study was to identify early childhood predictors of TV exposure during mealtime—an important context for pediatric obesity prevention. We found that child as well as parent characteristics predicted child TV engagement during mealtime. Children with greater negative emotionality in early childhood were more likely to engage with TV during mealtime than to have no TV. Similarly, early parenting disciplinary practices characterized by over-reactivity and laxness increased the risk for child TV engagement versus no TV during mealtime approximately 2 years later.

Children who have mood instability and are prone to negative emotions (eg, anger, irritability), may be challenging to the parent in certain contexts, such as mealtime. Organizing and managing family mealtimes can be stressful<sup>12</sup>; attempting to feed or engage with a child with mood instability could amplify the stress of mealtime. Indeed, one challenge reported by parents in carrying out family mealtimes is parent-child conflict and power struggles between the parent and child.<sup>13</sup> Thus, it is plausible that families of children with poorer emotion regulation might attempt strategies such as allowing television viewing during mealtime to prevent conflict and achieve mealtime goals.

Suboptimal discipline practices during early childhood also predicted increased risk for child TV engagement during mealtime 2 years later. There are several potential mechanisms by which an overreactive and lax parenting style could promote TV engagement during mealtime. First, parents who over-react to child behaviors might experience mealtimes as particularly overwhelming and stressful. For families already experiencing multiple stressors, such as the low-income families in our study, TV during mealtime might be a means by which to create a quiet/

**Table 2.** Multinomial Regression Models for Predicting TV Exposure/Engagement During Mealtime\*

	Background TV Exposure			TV Engagement		
	RRR	95% CI	Wald	RRR	95% CI	Wald
Child sex	1.76	0.84–3.67	2.26	1.97*	1.03–3.78	4.17
Child age	1.06*	1.01–1.11	5.73	1.00	0.96–1.04	0.01
Maternal education	0.89	0.43–1.87	0.09	0.74	0.39–1.43	0.79
Suboptimal discipline practices	1.45	0.88–2.40	2.10	1.60*	1.02–2.51	4.12
Negative emotionality	2.05	0.91–4.61	3.01	2.11*	1.04–4.30	4.27

CI indicates confidence interval; RRR, relative risk ratio.

Data adjusted for child race/ethnicity. Child sex was coded as male = 1; female = 2; maternal education level was coded as 0 ≤ high school degree/GED and 1 > high school degree/GED.

\*Reference category is no TV exposure; \*  $P < .05$ .

calm atmosphere (and potentially decrease the possibility of parent-child interactions that tax the caregiver). It is also possible that with a lax or permissive parenting style, rules about TV exposure during mealtime might not be enforced or implemented. Indeed, this has been reported in another study in which lax maternal parenting style was associated with greater amounts of child TV time.<sup>14</sup>

It might also be that harsh parenting early in childhood might engender a stressful emotional climate in the home and/or foster less communicative parent-child interactions over time. As has been suggested by others,<sup>15</sup> harsh/over-reactive parenting style might be stressful for some children. Thus, in the context of mealtime, children might attend to TV instead of engaging in potentially stressful or unrewarding interactions with their caregivers. This might also explain why we found that dysfunctional parenting practices only predicted child TV engagement and not simply whether the TV was on and the child did not watch it.

It is important to distinguish that these early childhood characteristics did not predict background TV exposure, relative to no TV, during mealtime—only whether the child attended to TV during mealtime. This could be explained by the fact that background television or “constant television households” are more common among low-income families.<sup>16</sup> Half of the families in the current study had audible television programming during the family meal. However, our results show that of the families with the TV on, approximately 43% of children did not attend to the screen at all during their meal. It is possible for these families, TV noise is a normative background sound in their environments.

Although the observational methods are a strength of this study, there is a possibility for the Hawthorne effect, wherein some parents might have not allowed TV to be on during the mealtime because of the video recording. These results are limited to TV exposure during mealtime but it is possible these early predictors of mealtime TV exposure might also apply to new mobile technology. With the recent trends in children’s mobile device ownership,<sup>17</sup> it will be important for future research to also assess children’s use of other screen media, because it is possible that these parent and child risk factors might also be precursors to mobile device use during mealtime. It should also be acknowledged that other caregivers responsible for child feeding were not assessed in the current study. Results are specific to the primary caregiver (in our study, mothers) but future research should assess whether parenting practices of the other caregivers might also associate with mealtime TV use. It is important to acknowledge that these results are based on low-income families, most of whom are non-Hispanic white. Thus, our findings might not generalize to families from higher income brackets or of different racial/ethnic backgrounds. However, because obesity disproportionately affects children from low-income backgrounds, our findings still have important implications for those most in need of obesity prevention strategies. When treating children with emotion regulation difficulties, pediatricians could elicit from parents how they manage meal-times and provide alternatives to TV use to manage child

difficult behavior. Likewise, messages about no TV use during mealtime might be especially important to parents who have over-reactive and lax parenting styles. In terms of obesity prevention interventions, improving early childhood emotion regulation and the emotional climate of family mealtime might mitigate the risk of unfavorable mealtime practices, such as child TV engagement. Future research should examine whether improving parenting practices and child emotion regulation reduces children’s TV use during mealtime and lowers obesity risk.

## CONCLUSIONS

Child emotion regulation as well as dysfunctional parenting practices in early childhood predicted an increase in risk for child TV engagement during dinner time 2 years later. Low-income families with these risk factors could be identified early to prevent obesity-promoting mealtime practices. Interventions might target general parenting style and child emotion regulation as one means by which to reduce mealtime TV use.

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## REFERENCES

1. Hammons AJ, Fiese BH. Is frequency of shared family meals related to the nutritional health of children and adolescents? *Pediatrics*. 2011; 127:1565–1574.
2. Berge JM, Wall M, Hsueh TF, et al. The protective role of family meals for youth obesity: 10-year longitudinal associations. *J Pediatr*. 2015;166:296–301.
3. Fulkerson JA, Loth K, Bruening M, et al. Time 2 tlk 2 nite: use of electronic media by adolescents during family meals and associations with demographic characteristics, family characteristics, and foods served. *J Acad Nutr Diet*. 2014;114:1053–1058.
4. Feldman S, Eisenberg ME, Neumark-Sztainer D, et al. Associations between watching TV during family meals and dietary intake among adolescents. *J Nutr Educ Behav*. 2007;39:257–263.
5. Radesky JS, Silverstein M, Zuckerman B, et al. Infant self-regulation and early childhood media exposure. *Pediatrics*. 2014;133: 1172–1178.
6. Thompson AL, Adair LS, Bentley ME. Maternal characteristics and perception of temperament associated with infant TV exposure. *Pediatrics*. 2013;131:390–397.
7. Ansari A, Crosnoe R. Children’s hyperactivity, television viewing, and the potential for child effects. *Child Youth Serv Rev*. 2016;61: 135–140.
8. Goulding AN, Rosenblum KL, Miller AL, et al. Associations between maternal depressive symptoms and child feeding practices in a cross-sectional study of low-income mothers and their young children. *Int J Behav Nutr Phys Act*. 2014;11:75–86.
9. Arnold DS, O’Leary SG, Wolff LS, et al. The Parenting Scale: a measure of dysfunctional parenting in discipline situations. *Psychol Assess*. 1993;5:137–144.
10. Shields A, Cicchetti D. Reactive aggression among maltreated children: the contributions of attention and emotion dysregulation. *J Clin Child Psychol*. 1998;27:381–395.

11. Trofholz AC, Tate AD, Miner MH, et al. Associations between TV viewing at family meals and the emotional atmosphere of the meal, meal healthfulness, child dietary intake, and child weight status. *Appetite*. 2017;108:361–366.
12. Rhee K. Childhood overweight and the relationship between parent behaviors, parenting style, and family functioning. *Ann Am Acad Polit Soc Sci*. 2008;615:11–37.
13. Fulkerson JA, Story M, Neumark-Sztainer D, et al. Family meals: perceptions of benefits and challenges among parents of 8-to 10-year-old children. *J Am Diet Assoc*. 2008;108:706–709.
14. Jago R, Davison KK, Thompson JL, et al. Parental sedentary restriction, maternal parenting style, and television viewing among 10- to 11-year-olds. *Pediatrics*. 2011;128:572–578.
15. Rhee KE, Lumeng JC, Appugliese DP, et al. Parenting styles and overweight status in first grade. *Pediatrics*. 2006;117:2047–2054.
16. Roberts DF. *Kids and Media at the New Millennium*. Collingdale, PA: Diane Publishing; 1999.
17. Kabali HK, Irigoyen MM, Nunez-Davis R, et al. Exposure and use of mobile media devices by young children. *Pediatrics*. 2015;136:1044–1050.