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The Nature and Predictive Value of Mothers' Beliefs Regarding Infants' and Toddlers' TV/Video Viewing: Applying the Integrative Model of Behavioral Prediction

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Abstract

Viewing television and video programming has become a normative behavior among US infants and toddlers. Little is understood about parents' decision-making about the extent of their young children's viewing, though numerous organizations are interested in reducing time spent viewing among infants and toddlers. Prior research has examined parents' belief in the educational value of TV/videos for young children and the predictive value of this belief for understanding infant/toddler viewing rates, though other possible salient beliefs remain largely unexplored. This study employs the integrative model of behavioral prediction (Fishbein & Ajzen, 2010) to examine 30 maternal beliefs about infants' and toddlers' TV/video viewing which were elicited from a prior sample of mothers. Results indicate that mothers tend to hold more positive than negative beliefs about the outcomes associated with young children's TV/video viewing, and that the nature of the aggregate set of beliefs is predictive of their general attitudes and intentions to allow their children to view, as well as children's estimated viewing rates. Analyses also uncover multiple dimensions within the full set of beliefs, which explain more variance in mothers' attitudes and intentions and children's viewing than the uni-dimensional index. The theoretical and practical implications of the findings are discussed.

Keywords

Infants/toddlers; television; quantitative; surveys; mothers; integrative model of behavioral prediction

It has been more than a decade since the emergence of academic research regarding the influence of baby media products on infant/toddler development. The bulk of evidence accumulated since that time suggests limited or no cognitive or educational benefits of commercially available TV/videos for very young children, particularly in comparison to their learning from information presented in live, social interactions (Courage & Setliff, 2010; Krcmar, 2010). This pattern in findings, coupled with concerns that viewing time would displace babies' time spent in more beneficial activities, has spurred health departments from the United States, Australia, and Canada to officially discourage screen media use with children under two years of age (AAP, 2011; ADHA, 2011; Lipnowski &

LeBlanc, 2012; Sigman, 2012). Additionally, in 2008 the French High Audiovisual Council banned French television channels from airing programming targeting children under age three (Alleyne, 2008). Despite this, most American infants and toddlers do spend time viewing TV/videos, with the most current estimates indicating between 61-78 minutes of viewing daily for the average child under age two (Rideout, 2011; Vaala, Bleakley, & Jordan, 2013). While normative international viewing rates are not yet available, existing estimates suggest that infant/toddler TV/video-viewing time is increasing in other developed nations as well (e.g., Alston & St James-Roberts, 2005; Cheng et al., 2010).

Unfortunately, very little is understood about the factors driving parents' decision-making and ultimate behavior regarding their young children's media use. Several studies have queried American parents about beliefs related to young children's TV/video use, particularly the educational value of infant/toddler programming (Rideout, Vandewater & Wartella, 2003; Vandewater et al., 2007; Zimmerman, Christakis & Meltzoff, 2007). These surveys indicate that many parents consider baby media programs and products to be educational for young viewers. In one survey regarding baby videos/DVDs over 70% of parents of 6- and 18-month-olds felt that these products had the "potential to stimulate brain development", while more than half felt that baby videos "teach concepts" to their children (55%; Courage, Murphy, Goulding & Setliff, 2010). In survey analysis by Zimmerman and colleagues (2007), nearly a third of parents with children under two felt that the television programs and videos they showed their child "teach him/her something or are good for his/her brain," and rated this belief as the most important reason for using screen media with their child. Additionally, Vandewater and colleagues (2007) found that those parents who believed that "television mostly helps children's learning" were more than two times more likely to show TV/videos to their child under two than those who did not endorse this belief, though differences in the actual viewing rates were not reported. It is important to note, however, that parents in these studies were given limited response options from which to choose. Indeed, 13% of parents surveyed by Zimmerman, Christakis and Meltzoff (2007) listed "other reasons" as the most important basis for using screen media with their baby.

Results of previous parent surveys do not give a full picture of the parental beliefs that drive infant/toddler TV/video viewing or whether certain classes of beliefs may predict infant/toddler viewing more efficiently than others. One reason for the short-coming is that the authors of previous surveys did not elicit relevant beliefs from parents before building and administering the surveys. Instead, they polled parents about beliefs chosen a priori by the investigators. As such, crucial determinant beliefs underlying TV/video use with babies may have been left out, leaving us with a limited understanding of the full range of beliefs parents hold about infant/toddler TV/video viewing, and how each may be related to children's viewing time. What is more, most investigations examine the predictive value of discrete parental beliefs or combine all queried beliefs into a single index, obscuring the possibility that certain classes of beliefs (e.g., that TV/video use with infants/toddlers serves various instrumental parenting functions) may be more predictive of behavior than individual beliefs or a full index of all beliefs.

The Integrative Model of Behavioral Prediction

The integrative model of behavioral prediction (IM; Fishbein & Ajzen, 2010) provides a useful framework for studying the relationships between parents' cognitions about infant/toddler TV/video viewing and the extent to which they let their young children view these media. Well-established as a powerful model for predicting behavior across numerous fields, the IM contends that performance of a behavior is most accurately predicted from individuals' intentions to perform or not perform that behavior. Intention, in turn, is determined by some combination of their attitudes, perceived normative pressure, and/or perceived control over the behavior. One's attitudes, perceived normative pressure, and perceptions of behavioral control are respectively shaped by his/her underlying beliefs about the expected outcomes from performing the behavior, the perceived expectations of influential social figures, and the perceived ability or insurmountable obstacles to performing the behavior.

Clearly, this model has theoretical value for understanding the psycho-social determinants of the performance or nonperformance of behaviors of interest. As evidenced by its popularity in the field of health communication, the IM also has practical import for those interested in boosting or reducing certain behaviors with public health implications (e.g., condom use; smoking). Careful examination of the underlying beliefs most strongly related to behavioral performance enables campaign designers to choose beliefs to target within campaign messages (Fishbein & Yzer, 2003). Sufficiently altering beliefs through such messages should impact people's broader attitudes, perceived normative pressure, and/or perceived behavioral control, which in-turn impact behavioral intentions, and ultimately, actual behavior (see Fishbein & Ajzen, 2010).

Prior analyses have found that attitude is the strongest psycho-social predictor of US mothers' intentions to use and actual use of TV/videos with their young children (i.e., compared to norms; perceived control; Author, in press), indicating that the discrete beliefs underlying attitudes ("behavioral beliefs") are particularly important to examine. According to the tenets of the integrative model, behavioral beliefs reflect mothers' "expectancy value" of TV/video use, or their expectations of the positive and negative outcomes associated with infant/toddler TV/video use (e.g., TV/videos will have educational benefit for their infants/toddlers; children's viewing will allow the parent to complete household chores; Fishbein & Ajzen, 2010). Further, the model contends that people's general attitude toward a behavior is best predicted by the overall valence of their behavioral beliefs; those expecting more favorable outcomes compared to unfavorable outcomes should have a more positive general attitude about the behavior, and vice versa. However, it is possible that some dimensions within the full set of behavioral beliefs may be more or less efficient in predicting attitudes, intention, and behavior than a single scale of the complete set.

The present study analyzes a comprehensive set of maternal behavioral beliefs regarding infant/toddler TV/video viewing which were elicited from a prior interview study with American mothers of infants and toddlers (Author, 2011). Many of these beliefs have not been previously studied in research with parents of babies and toddlers. The goals of this study are to determine the extent to which various maternal beliefs about infant/toddler TV/

video viewing predict their attitudes, intentions, and children's weekly time spent viewing TV/videos. Of particular interest are the presence of qualitatively different classes of behavioral beliefs within the full set, and the predictive value of such subscales compared to an aggregate scale of all behavioral beliefs.

Research Questions and Hypotheses

Based on the principles of the IM, mothers' general attitudes regarding TV/video use with their infants and toddlers should be determined by the overall valence of their underlying behavioral beliefs. Those who predominantly associate infants' and toddlers' TV/video viewing with positive outcomes will have more favorable general attitudes towards their children's exposure, while those who have more negative expectations of infant- and toddler-directed TV/videos will have less favorable attitudes. However, various behavioral beliefs may be more or less common among members of a given population, and their endorsement may also be more or less predictive of general attitudes and actual performance of the respective behavior.

Research Question 1

Which specific behavioral beliefs will most discriminate between mothers whose children view more TV/videos from those whose children view less?

Hypothesis 1

The strength and valence of mothers' combined underlying behavioral beliefs will predict their general attitudes towards infant/toddler TV/video viewing, as well as their intentions for future viewing and the extent of children's typical viewing.

Of further interest in this study is the possibility of one or more multi-dimensional structures within mothers' behavioral beliefs regarding infant/toddler TV/video viewing. As described by the authors of the integrative model and its antecedents, behavioral beliefs constitute a uni-dimensional construct. That is, an individual's perceived likelihood of each possible outcome (often weighted by his/her evaluation of the favorability of that outcome) is summed together with the values from all other possible outcomes to form a single behavioral belief index (Fishbein & Ajzen, 2010). The belief index is subsequently used to predict individuals' general attitudes towards the behavior. This strategy is predicated on the idea that beliefs with a positive valence (i.e., expectations of favorable outcomes) and beliefs with a negative valence (i.e., expectation of unfavorable outcomes) are similarly associated with the behavior such that the cumulative valence (neutral, positive, or negative overall expectations) of the full set of beliefs is most predictive of behavior. However, if, for example, mothers' positive beliefs about infant/toddler TV/video viewing are more strongly predictive of intentions and behavior, regardless of the negative beliefs they hold, then combining all beliefs into a single index would be misleading. That is, mothers may hold both positive and negative behavioral beliefs about infant/toddler TV/video viewing, but it may be the case that their attitudes, intentions, and/or behavior are driven by one or the other dimension more strongly. In fact, research which has incorporated separate scales of positive and negative beliefs underlying other behaviors has evidenced differences in their predictive

powers (e.g., in the case of sugar-sweetened beverage consumption, Authors, in press). Findings that indicate beliefs of a certain valence—positive or negative—have dissimilar weights in accounting for intentions and behavior is interesting in-and-of themselves, and also highlight the types of beliefs that would be best targeted in interventions with greater confidence than analyses using only the full behavioral belief index.

Furthermore, prior studies involving various target behaviors have found that thematically different classes of behavioral beliefs can have disparate relationships with attitude, intention, and behavior (e.g., Bagozzi, 1981; Shimp & Kavas, 1994; Taylor & Todd, 1995). That is, some beliefs are associated with each other in ways that reflect varied underlying themes in the outcome expectancies. For example, a study by Shimp and Kavas (1984) indicated that individuals' attitudes regarding the use of coupons were differently predicted by their behavioral beliefs reflecting (1) time/effort inconveniences (i.e., associated with clipping and redeeming coupons), (2) encumbrances (i.e., associated with seeking out media containing coupons and shopping in non-preferred stores for non-preferred brands), and (3) expected rewards (i.e., saving money and feeling like a thrifty shopper) anticipated from performing the behavior. Thus, thematic scales may yield even more nuanced information about the links between beliefs and attitudes, intention, and behavior than the valenced belief subscales or the full behavioral belief index.

If behavioral beliefs are multi-dimensional in nature, by valence or by theme, then combining them into a single index could obscure important predictive relationships between various qualitatively distinct cognitions and general attitudes and behavior. Conversely, understanding the relationships in the more complex belief structure would enhance knowledge regarding the operation of the IM for a given behavior, as well as more accurately inform the appropriate design of a campaign addressing that behavior (i.e., by boosting explanatory power, see Taylor & Todd, 1995). As such, this study will examine the potential multi-dimensionality of mothers' behavioral beliefs regarding their infants' and toddlers' TV/video viewing. Specifically, analyses examine possible differences between positively and negatively valenced behavioral beliefs, as well as thematically different beliefs (e.g., reflecting the educational value of TV/videos; instrumental parenting functions). Analyses will investigate whether thematic categories exist among the behavioral beliefs of mothers in this study, as well as possible differences in the extent to which they account for children's estimated weekly TV/video viewing compared to a single uni-dimensional index.

Research Question 2

Are there separate valence dimensions within mothers' behavioral beliefs about infant/toddler TV/video exposure?

Research Question 3

Are there separate thematic dimensions within mothers' behavioral beliefs about infant/toddler TV/video exposure?

Research Question 4

Do different dimensions of mothers' behavioral beliefs about infant/toddler TV/video exposure (e.g., positive/negative dimensions; thematic dimensions) differently predict their attitudes and intentions and the extent of children's TV/video viewing?

Methods

Sample

This study consists of a cross-sectional survey of 698 mothers with children between 3 - 27 months old. Following IRB study approval, participants were recruited through Survey Sampling International (SSI), which has a national panel of nearly one million US members. SSI recruits its members through various techniques online (e.g., banner ads), and provides compensation for study completion in the form of lottery drawings or points which can be cashed in for money. In total, 867 respondents clicked on the survey link emailed to them from SSI, were eligible to participate (i.e., had a child in the target age range), and agreed to take the survey.¹ Of this group, 137 respondents quit without finishing at least 80% of the survey and their data was omitted from the final sample. Nine participants who did not finish the survey completed more than 80% of the survey were retained at this step. Based on formative survey testing and survey link testing, it was deemed unlikely that respondents could complete the survey in less than 10 minutes if they actually read the majority of the questions. Thus, the subset of participants that took less than 10 minutes to complete the survey ($n = 31$) were omitted from the final sample. The final sample of 698 participants represents 81% of the original 867 that clicked on the survey link and were eligible to participate.

Table 1 contains descriptive information about the sample of mothers, which was fairly diverse with regards to socioeconomic status measures like education and income. Target children ranged in age from 3.9 months to 27.5 months, with a mean age of 14.6 months ($SD = 6.11$).² Half of the target children were girls (50.6%), and more than 42.7% were first-born. About a fifth of children were in some form of outside-the-home childcare (19.8%).

Procedure

The survey was conducted online with an instrument reflecting the integrative model survey design outlined by Fishbein & Ajzen (2010). SSI sent recruitment emails to panel members who fit the criteria for study participation (i.e., women over age 18 living in the US and parenting children between 3 - 24 months of age), containing a link to the survey. Survey construction was based on results of an elicitation interview study with a separate sample of mothers (Author, 2011). Data collection occurred over 7 consecutive days in mid-March, 2011.

¹Information about how many SSI panelists received a recruitment email is not available.

²19 mothers responded that they had a child 24 months old or younger, but then entered the child's age as 25-27 months. These children were left in the analyses since they were within 3 months of the target age range.

Measures

Participants were asked how many children they had between 3 months and 24 months of age. Those with more than one child in this age range were prompted to think of the child “whose name comes first in the alphabet”. All participants were asked to type the target child’s first name into a given space so the computer could generate the name into subsequent questions.

Demographics—Respondents reported their age, race/ethnicity, last grade or degree completed in school, household income, and marital status. They also gave descriptive information about the target child, including gender, age, birth order, and whether the child was in outside-the-home childcare.

Child’s TV/video viewing—The following statement was displayed on the screen before the TV/video viewing items:

“The following questions are about your child’s television/video viewing – that is, television programs and videos made for children that you or someone else turn on with the intention that your child will watch it at least a little. Your child may watch these programs or videos on any type of a screen- such as a television, computer or portable DVD player.”

Respondents reported the number of weekdays (0 – 5) the child typically watches at least some television or videos. Mothers of children that viewed on at least one day each week were asked to indicate how much time in a typical weekday the child spends viewing, choosing one of five response options (broken up in 2 hour increments between “less than 2 hours” and “8 hours or more”). They then chose one of four response categories to indicate a more detailed range of viewing time in a typical day (e.g., “less than 30 minutes;” “at least 30 minutes but less than 1 hour”). This series of questions was repeated to measure weekend viewing. The number of weekdays that the child watches was multiplied by the midpoint of the specific category of daily viewing (i.e., 45 minutes for the category “at least 30 minutes but less than 1 hour”). This step was repeated for weekend viewing. These two figures were summed to represent the child’s estimated weekly TV/video viewing.³

Mothers’ attitudes—Mothers’ attitudes toward children’s TV/video viewing were assessed by three 7-point semantic differential items. They addressed respondents’ attitudes regarding the target child viewing TV/videos “for more than an hour a day on at least several days each week during the next month” in terms of whether such viewing would be (1) bad/good; (2) foolish/wise; and (3) harmful/beneficial.

Children’s TV/video viewing was operationalized in this way (“more than an hour a day on at least several days each week”) within the integrative model items for several reasons. First, prior research as well as a small pilot study for the present research indicated a large range in young children’s exposure to TV/videos (e.g., Anderson & Pempek, 2005; Courage,

³The two-item structure was used to boost report accuracy and enable the report of specific time quantities in a less unwieldy way than would be possible with one item. Parent reported direct estimates of young children’s media use are common in the literature, particularly within large-scale survey research (Rideout, Vandewater, & Wartella, 2003; Vandewater & Lee, 2009).

Murphy, Goulding & Setliff, 2010; Rideout, Vandewater & Wartella, 2003). “More than an hour a day on at least several days each week” was chosen as a time-frame because this viewing amount (about 3 hours per week) represented the median in the pilot study, and approximates the mean reported in previous studies (e.g., Vandewater et al., 2007). This behavioral operationalization was also of interest because the AAP’s recommendation is a particularly conservative policy. That is, existing research does not indicate that limited exposure to TV/videos is inherently harmful for children under two; furthermore, avoiding all such exposure may not be feasible for the majority of parents. In this case, understanding what makes mothers expose their infants and toddlers to *some* television and video content instead of *a lot* may have more practical value.

Mothers’ behavioral beliefs—Thirteen positive and 17 negative behavioral beliefs were developed from an elicitation interview study conducted with a separate sample 37 mothers of infants and toddlers (Author, 2011). The elicitation interview design was based on the standard format used by Fishbein & Ajzen (2010). Mothers of infants and toddlers were interviewed individually until saturation in responses was reached. All beliefs mentioned by at least two mothers in the elicitation study were included on the present survey instrument. Each of the 30 behavioral belief items was framed in terms of the child viewing “more than an hour a day on at least several days each week”. Each item was accompanied by a 7-point response scale ranging from 1: “unlikely” to 7: “likely.” The order of the 30 behavioral belief items was randomized across participants. The behavioral beliefs are listed in Table 2.

Mothers’ intentions—Two items were included to assess participants’ intentions to let their target children watch TV/videos in the subsequent week. On a 7-point response scale (ranging from 1: “unlikely” to 7: “likely”), respondents were asked to respond to the following items: (1) “I will let [child’s name] watch television or videos for more than an hour a day on at least several days in the next week during the next month”; (2) “I will keep [child’s name] from watching any television or videos during the next month”. The second operationalization of intention was included because relevant policy discussions have framed the behavior in this way. That is, the AAP and others advocate no screen media exposure at all for children before the age of two years (AAP, 2011). Despite the lack of direct correspondence with the other IM survey items (which frame the target behavior around children viewing “more than an hour a day at least several days each week”), understanding the ability for mothers’ behavioral beliefs to also predict their intentions to keep their children from viewing any TV/videos was also of interest.⁴

Data Analysis

Research question 1

The degree of variability among the 30 behavioral beliefs was determined with examinations of the means, standard deviations, and medians. The bivariate relationships between individual behavioral belief items and child’s TV/video viewing and mothers’ intentions and attitudes were examined using correlation analysis. T-tests were used to analyze the

⁴The survey instrument included additional items not reported here (e.g., items regarding mothers’ perceived normative pressure; children’s background TV/video exposure).

differences in behavioral belief means between mothers whose children watched more than 3 hours per week of TV/video, and mothers whose children watched 3 hours or less.

Hypothesis 1

Cronbach's alphas and bivariate correlations were used to test internal consistencies of the 30 belief items before averaging them together to form a single index. An OLS regression analysis assessed the bivariate relationship strength between the full behavioral belief index and attitude. Three additional analyses were conducted, which contained the full belief index as the sole predictor of (1) mothers' intentions to let their children view more than an hour a day of TV/videos at least several days each week; (2) mothers' intentions to keep their children from viewing any TV/videos; and (3) the estimates of children's TV/video viewing.

Research question 2

Two belief subscales were created to address Research Question 2: (1) a subscale of the "positive" beliefs (i.e., worded such that higher responses indicate a more positive position on infant/toddler TV/video viewing), and (2) a subscale of the "negative" beliefs (i.e., worded such that higher responses indicate a more anti-infant/toddler TV/video use position). Cronbach's alpha values for each subscale were examined to determine the internal consistencies of the items.

Research question 3

The behavioral beliefs were reviewed for conceptual themes, and then items were grouped together based on a priori judgments that they reflect various belief themes. Following confirmatory factor analysis, subscale suitability was evaluated based on the presence of sufficiently high factor loadings (i.e., ≥ 0.40), adequate goodness of fit test values (i.e., comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR)), and modification indices results, and adequate internal consistency. Hypothesized items whose removal resulted in a higher alpha value for the subscale or which had low factor loadings were removed from respective subscales. Then confirmatory factor analyses and alpha tests were conducted on the revised subscales.

Research question 4

Using Pearson correlation analysis, bivariate relationships were assessed between the (1) the valenced belief subscales; (2) the thematic belief subscales; (3) the full belief index; (4) attitude; (5) intention to let child view more than an hour/day of TV/videos at least several days each week; (6) intention to keep the child from viewing any TV/videos; and (7) children's estimated TV/video viewing.

Four separate ordinary least squares (OLS) regressions were then conducted to determine the power of the positive and negative belief subscales in predicting mothers' attitudes, both types of intentions, and children's weekly TV/video viewing estimates. Standardized beta coefficients were assessed and compared to determine relative predictive power of the valenced subscales in each model. These analyses were repeated using the thematic belief subscales as predictors of each of the four constructs.

Results

Child's TV/video viewing

The estimates of children's weekly TV/video viewing time ranged from 0 to 68.25 hours per week. The estimates of viewing had a mean of 8.82 hours per week ($SD = 10.86$), and a median of 4.50 hours per week. Because the distribution of the viewing estimates was non-normal and substantially skewed, this variable was transformed by adding 1 and then taking the square root. In addition, the original continuous variable was dichotomized to split children into two groups: (1) those who do not watch more than 3 hours per week of TV/videos, and (2) those who do watch more than 3 hours per week of TV/videos.⁵

Attitudes

Mothers reported their attitudes toward letting their child watch TV/videos for more than an hour a day on at least several days each week on 3 dimensions: bad/good; foolish/wise; harmful/beneficial. Each item was on a 7-point scale, with a 7 representing the most pro-TV/video attitude. The respective means and standard deviations were as follows: bad/good ($M = 3.89$, $SD = 1.65$); foolish/wise ($M = 3.81$, $SD = 1.59$); and harmful/beneficial ($M = 4.09$, $SD = 1.55$). The three attitude items had a Cronbach's alpha of 0.94. They were averaged together to create a single estimate of participants' general attitudes toward letting the target children watch more than an hour of TV/videos a day for at least several days each week. This scale had a mean value of 3.93 ($SD = 1.51$) and a median of 4.00 (i.e., on a 7-point scale).

Intentions

On a 7-point scale from "Not at all likely" to "very likely", participants reported the likelihood that they would let their child watch more than an hour a day at least several days during the subsequent week. The mean response on this item was 4.19 ($SD = 2.15$), and the median was 4.0. Using the same response scale, mothers were also asked the likelihood that they would keep their child from watching any TV/videos at all in the next week. This item had a mean of 2.60 ($SD = 1.91$), and a median value of 2.0.

Research question 1

This question asked which discrete behavioral beliefs most discriminate mothers whose children spend more time viewing TV/videos from those whose children view less. Means for the 30 belief items are presented in Table 2. Results indicated that mothers' mean endorsements of positive beliefs were slightly higher on average than their mean endorsements of negative beliefs.

Pearson correlation coefficients for relationships between the positive and negative beliefs and attitudes, intentions, and behavior are contained in Table 2. Among the discrete positive beliefs, attitudes and intentions had the strongest relationships with the beliefs that TV/video viewing could (1) stimulate the child's creativity; (2) stimulate the child's attention or ability

⁵The variable was dichotomized this way as it resembles the closest approximation of the "behavior" contained in the IM survey items (i.e., "let child watch more than an hour a day at least several days each week").

to focus; (3) be a good way to spend time with the child; and (4) help the child learn. These four beliefs also had the strongest correlations with exposure.

The negative beliefs with the strongest associations with attitude and intention were the beliefs that TV/video viewing could: (1) detract from the child's time spent in learning activities; (2) hurt the child's creativity; (3) take away from the child's social interactions; (4) make the child less interested in reading; and (5) take away from time the child spent getting healthy physical activity. Those most associated with exposure included the beliefs that TV/video viewing could (1) detract from time the child spent interacting socially; (2) detract from the child's time in learning activities; (3) detract from child's healthy physical activity; and (4) be a waste of time that the child spends "zoning out."

Next, t-tests were conducted to test the differences in means for each belief among mothers whose children viewed more than 3 hours of TV/video each week and those whose children viewed less. The t-tests were used to examine relationships between mothers' beliefs and children's estimated weekly viewing that might not be linear, and also to parallel the manner in which the attitude and intention survey questions were worded (i.e., since watching more than an hour a day at least several days each week would constitute more than 3 hours of viewing).

As shown in Table 2, these analyses indicated similar patterns. That is, for each positive behavioral belief the mean value among mothers whose children watched more than 3 hours per week was significantly lower than the mean value among mothers who children watched 3 or more hours a week. With the exception of the belief that TV/videos could teach children skills/information that the mother would rather teach, the mean value of negative belief items were lower among mothers whose children viewed 3 hours or more TV/videos each week.

The positive beliefs that best discriminated between children who view more or less TV/video (i.e., evidenced the greatest difference in means between mothers with children who watched less than 3 hours per week and those whose children watched 3 hours or more per week) included the beliefs that TV/videos could: (1) be good way to spend time with child; (2) help structure the child's day or establish a routine; (3) stimulate the child's creativity; (4) help the child learn social/emotional skills; and (5) stimulate the child's attention or ability to focus. The negative maternal beliefs that best discriminated between children who watch more or less TV/videos were the beliefs that TV/videos could: (1) cause the child to have less interest in reading; (2) detract from time the child spends socially interacting; (3) detract from the time the child spends in learning activities; (4) reduce time the mother spends interacting with the child; and (5) be a waste of time when the child was just zoning out.

Hypothesis 1

Based on the tenets of the IM, this hypothesis predicted that the singular index of mothers' behavioral beliefs would be predictive of their attitudes, intentions, and estimates of children's time spent viewing TV/videos. Following individual item analysis, the 17 negative behavioral beliefs were reverse-coded such that a "1" represented an anti-TV/video

stance, and a “7” represented a pro-TV/video stance for all of the 30 beliefs. Next, the internal consistency of the behavioral belief items was examined to verify the appropriateness of creating a combined index of these items. Cronbach’s alpha for the 30 behavioral belief items was high at $\alpha = 0.90$. Item-scale statistics indicated that no item deletions would result in a higher Cronbach’s alpha for the scale. Thus, the 30 behavioral belief items were averaged to create one behavioral belief index score for each participant. This scale had a mean value of 4.60 ($SD = 0.99$) and a median of 4.60 also. The correlations between this index and other measures of interest are contained in Table 3.

A series of regression analyses were conducted to assess the relationship between the full behavioral belief index and mothers’ attitudes, intentions, and transformed estimates of children’s TV/video viewing. The standardized and unstandardized regression coefficients and R and R^2 values for each model are displayed in Model 1 within Table 4. The full belief index accounted for less variance in the transformed viewing estimates (adjusted $R^2 = 0.14$), compared to intention to keep the child from viewing (adjusted $R^2 = 0.17$), intention to let the child view more than an hour during at least several days each week (adjusted $R^2 = 0.26$), and attitudes (adjusted $R^2 = 0.39$).

Research question 2

The second research question asked whether distinct, valenced (positive and negative) dimensions exist within the set of behavioral beliefs. Separate subscales were created for the positive belief items and the original negative belief items (i.e., non-recoded). The positive behavioral belief subscale had high internal consistency ($\alpha = .91$), and a mean and median of 4.72 ($SD = 1.18$) and 4.69 respectively. The negative behavioral belief subscale also had high internal consistency ($\alpha = 0.95$), though individual item statistics indicated that removal of the “teaches child things I would rather teach” item was not strongly related to the other items and the scale reliability would not decrease with its removal. As shown in Table 2, this item was also not correlated with attitude, intentions, or children’s viewing estimates. Thus, this item was omitted such that the negative behavioral belief subscale was created by taking the mean of the other 16 negative beliefs.

Research question 3

This research question queried whether separate thematic dimensions exist within the set of behavioral beliefs. First, the belief items were reviewed for the presence of conceptual themes. Overall, the items seemed to reflect five different themes: (1) the cognitive/educational value of TV/videos (6 items, e.g., teaches the child; harms brain development); (2) the instrumental parenting value of TV/video use with infants/toddlers (4 items; e.g., occupies the child; soothes the child); (3) the value of TV/videos for engaging or entertaining infants/toddlers (3 items, e.g., lets’ child get actively involved in the music or other parts of the program); (4) the negative health/development implications for infants/toddlers (7 items, e.g., hurts their vision or hearing; detracts from their time spent being physically active); (5) undesirable behavioral implications of infant/toddler TV/video-viewing (9 items; e.g., teach child aggressive behaviors; child wastes time “zoning out”).⁶

A confirmatory factor analysis (CFA) was run using Stata 13.0 to assess the characteristics of the 5-factor structure. This solution yielded adequate goodness of fit (CFI = 0.92; RMSEA = 0.06; SRMR = 0.06; Weston & Gore, 2006). Cronbach's alpha values for the 5 subscales were also strong, ranging from $\alpha = 0.71$ to 0.92. The 5 separate belief subscales were created by taking the mean of the relevant items. The properties of the thematic belief subscales are described in Table 5.

Research question 4

The final research question asked whether different dimensions of mothers' beliefs (valenced; thematic) differently predict their attitudes, intentions, and estimates of children's TV/video viewing. First, Pearson correlation analyses were used to examine the bivariate relationships between (1) the five behavioral belief subscales and (2) the positive and negative belief subscales; (3) the full behavioral belief index; (4) attitude (5) intention to let the child watch TV/videos for more than an hour a day on at least several days next week; (6) intention to keep the child from watching any TV/videos next week; and (7) the transformed version of child's weekly TV/video viewing. The resultant bivariate correlations are displayed in Table 3.

Next, four OLS regression analyses were conducted using the positive and negative belief subscales to predict attitudes, intentions, and viewing estimates. Results mirrored the correlational results (see Table 4 Model 2). These analyses also indicated that together the positive and negative subscales accounted for more variance in attitudes (adj. $R^2 = 0.48$) and intentions to let the child watch more than an hour a day at least several days each week (adj. $R^2 = 0.30$), compared to intention to keep the child from viewing at all (adj. $R^2 = 0.19$) and the viewing estimates (adj. $R^2 = 0.15$). The adjusted R^2 of 0.48 with attitude for the two scales contrasts with an adjusted R^2 of 0.39 for the full behavioral scale, reported above.

Four additional OLS regressions were then conducted, using the values on the five thematic belief subscales to predict (1) attitude; (2) intention to let the child watch TV/videos for more than an hour a day at least several days each week; (3) intention to keep the child from watching any TV/videos; and (4) the transformed measure of children's viewing. As shown in Table 4 Model 3, three of the subscales were significantly predictive of mothers' attitudes toward infant/toddler TV/video use (i.e., the cognitive/educational value, instrumental parenting function, and unfavorable health/development subscales). Three subscales predicted mothers' intentions to let the child view more than an hour a day on at least several days each week (i.e., cognitive/educational value; instrumental parenting function; and unfavorable behavior implications), while the other two subscales were associated with intentions to keep children from viewing at all (i.e., engage/entertain child; unfavorable health/development subscales). Only the instrumental parenting function subscale was a statistically significant predictor of children's transformed viewing estimates, though the cognitive/educational value subscale was a marginally significant predictor ($p = 0.07$).

⁶Though conceptually some of the negative and positive belief items seemed to reflect related themes (e.g., that TV/video viewing would help child learn; that TV/video-viewing would detract from time spent in learning activities), a preliminary exploratory factor analysis revealed that the behavioral belief items broke into two subscales based on item valence. Thus, it was unlikely that a factor solution comprised of subscales containing items of positive and negative valence would yield satisfactory psychometric properties. Thus, the sets of negative and positive behavioral beliefs were examined separately for potential thematic subscales.

Together, the subscales accounted for 15% of the variance in the estimates of children's actual weekly TV/video exposure and 49% of the variance in mothers' attitudes, mirroring the variance accounted for by the positive and negative belief subscales (see Table 4 Models 2 and 3).

Discussion

This study represents a crucial step in understanding the specific beliefs mothers hold about infants' and toddlers' television and video viewing, and how they relate to children's actual viewing. Though concerned parties like the American Academy of Pediatrics, have already directed messages at parents to attempt to reduce early childhood TV/video exposure (see AAP, 1999;2011), such messages have been designed and disseminated without knowledge of many of the salient maternal beliefs examined in the present study. By uncovering salient, yet previously unexplored beliefs among American mothers about infant/toddler TV/video use, this study highlights the importance of using theory to guide campaign design and evaluation.

Mothers in this study had higher expectations of favorable outcomes from children's TV/video viewing than unfavorable outcomes on average, as evidenced by the higher means of discrete positive behavioral beliefs compared to negative beliefs. Notably, the beliefs that most discriminated between mothers whose infants/toddlers viewed more or less TV/video programming were largely not the beliefs most frequently studied in previous surveys (i.e., educational value; e.g., Rideout & Hamel, 2006; Vandewater et al., 2007; Zimmerman, Christakis & Meltzoff, 2007). In fact, mean differences between the mothers whose children had more or less exposure were largest among those with differing beliefs about the potential for TV/videos to (1) allow them to spend more time with their child, (2) structure the child's day or establish routine, (3) stimulate the child's creativity, and (4) help the child learn social/emotional skills.

Parental concerns about the potential for TV/video use to detract from children's time spent learning and hurt their brain development have been studied in earlier research, and were also among the five most discriminating negative behavioral beliefs here (see Rideout & Hamel, 2006). Only a handful of prior studies have examined parents' beliefs as predictors of TV/video use with infants and toddlers, though others have queried parents about a limited number of beliefs regarding infant/toddler viewing. The narrow focus on beliefs in the educational value and "babysitting" value of TV/video for very young children has limited the scope of our discussion about this behavior, its antecedents, and best approaches for reducing very young children's viewing. In addition to illustrating the importance of eliciting salient beliefs from the representative population in advance of larger scale survey research, the current findings indicate that potential future campaigns intended to reduce infants' and toddlers' time viewing television and videos may be more successful if they aim to alter various beliefs among mothers in addition to the potential for these media to help or harm young children's educational development. For example, media campaigns might attempt to change the perceptions that watching TV/videos with one's baby constitutes a good way to spend time with the child or could stimulate the child's creativity, or campaigns

could provide alternative means for accomplishing these goals (e.g., reading together; coloring with crayons).

In this study, the nature of mothers' attitudes was strongly related to the strength and valence of their combined discrete behavioral beliefs, as predicted by the tenets of the integrative model of behavioral prediction. Mothers whose overall beliefs about the expected outcomes of infant/toddler TV/video use were more positive in nature (i.e., expected more good outcomes) had more favorable general attitudes towards that use as well, while those with more negative beliefs tended to have unfavorable attitudes. The full scale of mothers' beliefs was also related to their intended use of TV/videos with their infants/toddlers and estimates of children's actual viewing in relationships that were weaker in magnitude but still significant.

More importantly, this research also suggests a multi-dimensional structure of mothers' beliefs regarding the favorable and unfavorable outcomes associated with their infants' and toddlers' TV/video use. In this study, there were differences between positive and negative behavioral beliefs, as well as between beliefs reflecting different themes in terms of the ability for various dimensions to predict mothers' attitudes and intentions and children's TV/video viewing. Notably, these differences varied between the dependent variables as well. That is, some belief dimensions accounted for more variance in attitudes and intentions to let children watch TV/videos for more than an hour a day at least several days each week, while others were stronger predictors of intentions to keep children from viewing any TV/videos and children's actual viewing estimates.

The strongest single predictor of children's viewing was the full behavioral belief index when compared to each of the *individual* belief subscales; that is, the standardized coefficient for the full belief index was higher than any of the individual coefficients for the valenced or thematic subscales (see Table 4). However, the full behavioral belief index may not be as helpful in practice, as interventions seldom address all behavioral beliefs related to a behavior, but rather they seek to determine a few beliefs to target in messages. Thus, knowing how the overall strength and direction of beliefs relates to a behavior is likely not as useful as knowing which types of beliefs are more or less related to that behavior.

Furthermore, the positive and negative belief subscales and five thematic belief subscales accounted for slightly more variance in each of the dependent variables than the full belief index when entered into models as *sets* of predictors. The differences were most striking among the models predicting attitudes, as the multi-dimensional valenced and thematic solutions each explained 48% and 49% of variance in attitudes, respectively, versus 39% explained by the full index.

The analyses using the valenced and thematic subscales also yielded crucial information regarding differences in predictive power based on the operationalization of the behavior. For example, the findings suggest that mothers consider the usefulness of TV/video use with infants and toddlers for parenting (e.g., occupy the child while parent does household chores) more in deciding how much TV/video viewing their child should do than in decisions of whether children should view at all. Conversely, beliefs about the undesirable

impact of TV/video viewing for children's health/development seems to weigh more heavily into parents intentions regarding whether to let them view at all. In fact, this stronger predictive relationship was found despite the lack of direct correspondence between the wording of the belief items and the intention item regarding letting children view at all. The other thematic belief subscale comprised of negative beliefs, regarding the undesirable implications for children's behavior, related more strongly to intentions pertaining to the amount children should view. Thus, campaign designers should carefully consider exactly what changes to behavior they want to encourage in advance of intervention design. In this case, beliefs may be more or less appropriate as message targets depending on whether the goal is to keep infants and toddlers from watching TV/videos at all (as championed by the AAP and others) or merely to reduce infant/toddler viewing to no more than a few hours per week.

Uncovering the multidimensional nature of the behavioral belief structure adds to the theoretical operation of the theory, as explanatory power was boosted by the multidimensional solutions. This new-found knowledge has important practical implications as well. For example, compared to their negative behavioral beliefs, mothers' positive beliefs were stronger predictors of attitude, intention to let children view more than an hour a day several days each week), and exposure. Thus, a potential campaign aimed at reducing infant/toddler TV/video viewing may be more successful if it seeks to reduce mothers' perceptions of the desirable outcomes associated with using TV/videos with their children, instead of increasing their perceptions of undesirable outcomes. However, emphasizing the possible negative repercussions of viewing may be more effective in campaigns aimed at encouraging mothers to keep infants/toddlers from viewing at all.

Given the present findings, specific themes may be even more useful to consider beyond mere belief valence. For example, targeting instrumental parenting function beliefs may be particularly successful given that this dimension was significantly predictive of attitudes, intentions to let the child view more than an hour a day, and actual estimated behavior when all thematic subscales were in the model. In particular, the belief that TV/video use is a "good way to spend time with the child" and "helps to structure the day or establish a routine" would be particularly important to target as these were the two discrete beliefs most associated with estimates of children's time spent viewing.

On the other hand, emphasizing that children may develop undesirable behavioral habits, such as becoming less interested in reading or wasting time just "zoning out" in front of the screen, may be best to target within campaigns seeking to keep mothers from showing their infants/toddlers any TV/videos at all. This thematic dimension was found to be most predictive of intentions to keep children from viewing any TV/video, and these two particular beliefs were among those most associated with children's TV/video-viewing estimates.

Limitations and Future Research

Though this study yields findings that offer crucial insights, its design has various limitations which leave some questions unanswered and point to important next steps for follow-up research. Perhaps the foremost limitation of this study is the cross-sectional nature

of the data. Because participants were surveyed only once the true causal order of relationships cannot be conclusively determined in this study. For example, it remains possible that mothers' prior behavior (i.e., TV/video use with their infants and toddlers) is in fact driving their attitudes, intentions, and behavioral beliefs, rather than the reverse. Given the lack of existing research regarding explanations of young children's media exposure, however, findings from this cross-sectional study represent a valuable launching point for follow-up confirmation and exploration of identified relationships using diverse methodologies.

Due to the importance of framing integrative model survey items around a very specific behavior, it was necessary to choose some quantity of TV/video viewing time in which to frame survey questions (Fishbein & Ajzen, 2010). Unfortunately, this method sacrifices the examination of these psycho-social constructs related to TV/video use as continuous variables for the sake of greater model efficiency and predictive ability. Moreover, the definition of mothers' "behavior" as children's estimated TV/video viewing is also potentially problematic in this study. It is possible that asking mothers to report the full extent of their children's TV/video viewing, rather than merely the amount that mothers themselves turn on for the children, may have introduced extra error into estimates of children's viewing. Furthermore, mothers' beliefs may have yielded stronger predictions of the amount of TV/videos that mothers directly turn on. If either of these things is true then relationships in this study would likely have been underestimated in comparison to the amount of viewing for which mothers are directly responsible.

The decision to use children's total viewing as a proxy for mothers' behavior was made because children's total time spent viewing is of more practical concern than merely the amount of time their mothers put on TV/videos for them to watch and because measuring only the time that mothers specifically turn on the television for the target children to watch could have biased findings on the basis of the amount of time mothers spend in the home with their children. The parent-reported global TV/video viewing estimate is an additional measurement limitation in this study. More detailed time use diaries or observational measures often yield more accurate measures, but are time consuming and resource intensive (Vandewater & Lee, 2009). Future studies should use diverse methodologies to determine how well mothers can estimate children's total TV/video viewing, including that which occurs when children are in the care of others, as well as the extent to which mothers are in control of their children's total viewing.

It is also possible that this survey omitted questions that would have incorporated additional dimensions of mothers' general attitude (e.g., whether the behavior is "pleasant/unpleasant"). The three questions which measured attitude on the survey (i.e., whether the behavior is "good/bad", "foolish/wise," and "harmful/beneficial") seem conceptually to measure mothers' perceptions of likely implications of TV/video use *for their children*. One aspect missing from the attitude scale may be mothers' perceptions of implications infant/toddler TV/video use *for themselves*. In fact, beliefs reflecting benefits of media use to the mother are incorporated into the "instrumental parenting function" belief subscale, a thematic belief component found to be significantly predictive of children's exposure. As

such, a richer measurement of attitude may have led to a better match between the dimensions of behavioral beliefs and attitude.

The findings highlight notable remaining questions, including the various sources of mothers' behavioral beliefs about infant/toddler TV/video viewing. Of further interest are the beliefs underlying the other psycho-social constructs in the integrative model (i.e., perceived normative pressure; perceived behavioral control). Future research should address mothers' other classes of beliefs, as well as the salient beliefs underlying fathers' use of TV/videos with young children. Fathers were not included in the present study as the tenets of the IM suggest that specific subpopulations may have very different relevant behavioral beliefs and that their beliefs and attitudes may be related to intentions and behavioral performance in distinct patterns. Differences may be expounded by the fact that US parents report that mothers generally take more responsibilities for daily child-related activities than do fathers (Renk et al., 2003).

Conclusion

It is clear that spending time in the presence of television and video programming has become a normative behavior among American infants and toddlers, though prior research provides scant illumination of how parents perceive of TV/video in the lives of their young children or what their beliefs mean for the extent of children's viewing. Results of this study fill gaps in our understanding of beliefs that underlie mothers' attitudes, intentions, and actual use of TV/videos with infants and toddlers.

The findings also indicate that the integrative model is a useful tool for examining infants' and toddlers' TV/video exposure, and that examining multi-dimensional structures within underlying beliefs is a valuable extension of the model. Indeed, this approach could be useful to those interested in explaining or changing behaviors beyond children's TV/video-viewing, and should be considered by researchers and campaign designers in diverse fields. Most directly, the results of this study also have practical implications for the design of future campaigns aimed at reducing infant/toddler exposure to television and videos. This research points to numerous maternal behavioral beliefs that could be targeted in interventions seeking to reduce or to eliminate infant/toddler television and video viewing, likely yielding greater success than the common focus on mothers' beliefs in the educational value of these media for young children.

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Table 1

Characteristics of the final sample.

Age mean $\pm$ SD, years	28.5 $\pm$ 6.6
Race/ethnicity, n (%)	
White/non-Hispanic	474 (67.9)
White/Hispanic	35 (5.0)
Black/African American	95 (13.6)
Asian	27 (3.9)
Other ^a	60 (8.6)
Refused/Missing	7 (1.0)
Marital Status, n (%)	
Married/Living as married	522 (74.8)
Separated/Divorced/Single	168 (24.1)
Refused/Missing	8 (1.1)
Employment, n (%)	
Full-time	134 (19.2)
Part-time	88 (12.6)
Homemaker	315 (45.1)
Student	49 (7.0)
Retired/Disabled/Unemployed	104 (14.9)
Refused/Missing	8 (1.1)
Education, n (%)	
No high school diploma	31 (4.4)
High school diploma/GED	190 (27.2)
Some college/Associate's	288 (41.2)
Four-year college degree	137 (19.6)
Graduate school	44 (6.3)
Refused/Missing	8 (1.1)
Income, n (%)	
Less than \$10,000	74 (10.6)
\$10,000 - \$29,000	192 (27.5)
\$30,000 - \$49,000	179 (25.6)
\$50,000 - \$74,000	113 (16.2)
\$75,000 +	97 (13.9)
Refused/Missing	43 (6.2)

N=698;

^aincludes participants of mixed race

Table 2

Relationships between discrete behavioral beliefs and mothers' attitudes, intentions, and estimates of children's weekly TV/video viewing.

Positive behavioral Belief	Mean	Attitude (r)	Intention (r)	Viewing estimates (r)	>3 hrs/week ^a (Mean)	3 hrs/week ^b (Mean)	Difference in means (t value)
Good way to spend time with child	4.11	0.55	0.40	0.33	3.49	4.54	1.05(-7.71)
Help to structure day/establish a routine	4.17	0.50	0.37	0.27	3.61	4.55	0.94(-7.45)
Stimulate child's creativity	4.74	0.56	0.44	0.32	4.20	5.11	0.91(-7.43)
Help child learn social/emotional skills	4.88	0.52	0.41	0.27	4.35	5.25	0.90(-7.09)
Stimulate child's attention/ability to focus	4.63	0.55	0.43	0.31	4.11	4.99	0.88(-6.87)
Can teach child things better than I can	4.04	0.47	0.37	0.25	3.58	4.36	0.78(-5.59)
Help child learn	5.28	0.54	0.44	0.29	4.82	5.59	0.77(-6.85)
Engage/entertain child	5.06	0.45	0.33	0.28	4.64	5.37	0.73(-6.33)
Child is actively involved in program/music	5.37	0.45	0.38	0.28	4.94	5.66	0.72(-6.57)
Stimulate child's vision or hearing	4.44	0.48	0.38	0.22	4.04	4.72	0.68(-5.16)
Calm child/distract from crying	4.62	0.35	0.26	0.20	4.24	4.89	0.65(-4.84)
Keep child busy/let me get things done	5.03	0.26	0.19	0.13	4.79	5.21	0.42(-3.10)
Expose child to things in outside world	5.02	0.33	0.23	0.16	4.73	5.14	0.41(-3.30)
Negative Behavioral Belief	Mean	Attitude (r)	Intention (r)	Viewing estimates (r)	>3 hrs/week ^a (Mean)	3 hrs/week ^b (Mean)	Difference in means (t value)
Make child less interested in reading	3.33	-0.36	-0.31	-0.22	3.90	2.94	-0.96(6.31)
Takes away from time spent in social interaction	3.77	-0.37	-0.32	-0.26	4.31	3.40	-0.91(6.03)
Detract from time spent in learning activities	3.61	-0.39	-0.35	-0.23	4.15	3.25	-0.90(6.22)
Child wastes time just "zoning out"	3.48	-0.40	-0.32	-0.23	4.00	3.12	-0.88(5.76)
Cause me to spend less time interacting with child	3.59	-0.30	-0.27	-0.19	4.07	3.27	-0.88(5.08)
Take away from healthy physical activity	3.89	-0.36	-0.28	-0.23	4.40	3.53	-0.87(5.59)
Make child less able to self-entertain	3.67	-0.29	-0.30	-0.21	4.18	3.33	-0.85(5.48)
Hurt brain development	2.91	-0.33	-0.28	-0.19	3.39	2.58	-0.81(5.75)
Hurt child's creativity	2.98	-0.37	-0.26	-0.19	3.39	2.70	-0.69(4.82)
Is under-stimulating/boring for child	3.39	-0.22	-0.24	-0.21	3.79	3.12	-0.67(4.93)
Hurt later intelligence	2.78	-0.31	-0.28	-0.18	3.15	2.52	-0.63(4.55)
Child will throw tantrums/beg when TV is off	3.21	-0.20	-0.20	-0.13	3.57	2.96	-0.61(3.70)

Positive behavioral Belief	Mean	Attitude (r)	Intention (r)	Viewing estimates (r)	>3 hrs/week ^a (Mean)	3 hrs/week ^b (Mean)	Difference in means (t value)
Teach child aggressive behaviors	2.90	-0.23	-0.23	-0.17	3.25	2.65	-0.60(4.24)
Bad for child's vision/hearing	3.19	-0.24	-0.20	-0.13	3.52	2.97	-0.55(4.02)
Could become habit-forming	4.46	-0.19	-0.19	-0.12	4.72	4.28	-0.44(3.11)
Child distracted/hypnotized by the screen	3.79	-0.23	-0.20	-0.14	4.05	3.62	-0.43(2.86)
Teach child things I would rather teach	4.10	0.04	-0.01	-0.05	4.05	4.13	0.08(-0.51)

Note. $N = 697$. All items are on a scale from 1 "unlikely to 7 "likely." Bold values = $p < .05$.

^aValue represents the item mean among mothers whose children view less than 3 hours of TV/video per week ($n = 271$).

^bValue represents the item mean among mothers whose children view 3 hours or more per week ($n = 426$).

Table 3

Correlations between thematic behavioral belief subscales, IM cognitive constructs, and children's estimated weekly TV/video -viewing

Construct	2	3	4	5	6	7	8	9	10	11	12
1 Cognitive/Educational subscale	0.70	0.74	-0.36	-0.30	0.94	-0.34	0.72	0.65	0.51	-0.20	0.34
2 Instrumental parenting subscale	1.00	0.69	-0.15	-0.09	0.87	-0.12	0.54	0.57	0.42	-0.11	0.32
3 Engagement/enjoyment subscale	--	1.00	-0.20	-0.14	0.86	-0.18	0.57	0.51	0.39	-0.17	0.30
4 Undesirable health/development subscale	--	--	1.00	0.89	-0.29	0.97	-0.85	-0.41	-0.35	0.44	-0.25
5 Undesirable behavior subscale	--	--	--	1.00	-0.22	0.98	-0.81	-0.36	-0.33	0.41	-0.24
6 Positive belief scale	--	--	--	--	1.00	-0.26	0.70	0.66	0.50	-0.19	0.36
7 Negative belief scale	--	--	--	--	--	1.00	-0.85	-0.39	-0.35	0.43	-0.25
8 Full belief index	--	--	--	--	--	--	1.00	0.62	0.51	-0.41	0.37
9 Attitude	--	--	--	--	--	--	--	1.00	0.64	-0.25	0.44
10 Intention to let child watch > 1hr/day	--	--	--	--	--	--	--	--	1.00	-0.30	0.57
11 Intention to keep child from watching at all	--	--	--	--	--	--	--	--	--	1.00	-0.21
12 Child's TV/video viewing estimate	--	--	--	--	--	--	--	--	--	--	1.00

Table 4

Prediction of mothers' attitude and intentions and child's TV/video viewing from the full belief index and valenced and thematic behavioral belief subscales.

Model	Predictor(s) in model	Attitude		Intention to show child >1hr on several days		Intention to keep child from watching at all		Viewing estimate	
		B (SE B)	β	B (SE B)	β	B (SE B)	β	B (SE B)	β
1	Full behavioral belief index	0.95 (0.05)	0.62***	1.12(0.07)	0.51***	-0.79(0.07)	-0.41***	0.57(0.05)	0.37***
	R		0.62		0.51		0.41		0.37
	Adj. R ²		0.39		0.26		0.17		0.14
2	Valenced belief subscales								
	Positive beliefs	0.76(0.04)	0.60***	0.81(0.06)	0.44***	-0.13(0.06)	-0.08*	0.41(0.05)	0.31***
	Negative beliefs	-0.24(0.03)	-0.24***	-0.34(0.05)	-0.23***	0.53(0.05)	0.41***	-0.17(0.04)	-0.17***
	R	0.70			0.55		0.44		0.39
	Adj. R ²	0.48			0.30		0.19		0.15
3	Thematic belief subscales								
	Cognitive/educational value	0.40(0.05)	0.36***	0.51(0.09)	0.32***	0.03(0.08)	0.02	0.12(0.07)	0.11
	Instrumental parenting function	0.33(0.05)	0.28***	0.30(0.08)	0.18***	0.03(0.08)	0.02	0.21(0.06)	0.18**
	Engage/entertain child	0.01(0.05)	0.001	-0.1(0.09)	-0.01	-0.18(0.08)	-0.12*	0.08(0.07)	0.07
	Unfavorable health/development	-0.19(0.06)	-0.19**	-0.07(0.10)	-0.05	0.42(0.09)	0.35***	-0.06(0.08)	-0.06
	Unfavorable behavior	-0.06(0.06)	-0.06	-0.26(0.10)	-0.18*	0.11(0.09)	0.09	-0.13(0.08)	-0.12
	R	0.70			0.56		0.45		0.40
	Adj. R ²	0.49			0.31		0.20		0.15

N = 697.

Table 5

Five-factor thematic behavioral belief solution.

Belief item	Factor loading on subscale	Subscale reliability if removed (α)
Educational/cognitive development value ($\alpha = 0.89$; subscale mean = 4.67)		
Stimulate child's creativity	0.84	0.86
Help child learn	0.81	0.86
Stimulate child's attention/focus	0.81	0.86
Help child learn social/emotional skills	0.76	0.87
Stimulate child's vision/hearing	0.71	0.88
Can teach child things better than I can	0.63	0.89
Instrumental parenting functions ($\alpha = 0.71$; subscale mean = 4.48)		
Good way to spend time with child	0.69	0.65
Calm/distract child from crying	0.63	0.60
Help structure day/establish routine	0.65	0.63
Keep child busy/let me get things done	0.47	0.69
Engagement/entertainment value ($\alpha = 0.72$; subscale mean = 5.13)		
Child actively involved in program	0.73	0.60
Engage/entertain child	0.70	0.64
Expose child to things in outside world	0.62	0.66
Unfavorable health/development implications ($\alpha = 0.92$; subscale mean = 3.31)		
Hurt child's creativity	0.81	0.90
Detract from time spent learning	0.81	0.90
Hurt later intelligence	0.81	0.90
Detracts from time social interacting	0.80	0.90
Detract from child's physical activity	0.79	0.90
Hurt brain development	0.79	0.90
Bad for child's vision/hearing	0.65	0.92
Unfavorable behavioral implications ($\alpha = 0.91$; subscale mean = 3.54)		
Child wastes time "zoning out"	0.83	0.89
Make child less interested in reading	0.80	0.89
I will spend less time interacting with child	0.77	0.89
Make child less able to self-entertain	0.76	0.90
Child distracted/hypnotized by screen	-0.71	0.90
Teach child aggressive behaviors	0.70	0.90
Child will tantrum/beg when turned off	0.70	0.90
Could become habit-forming	0.65	0.90
Under-stimulate/bore child	0.57	0.91

$N = 697$. All items are on a response scale from 1 (very unlikely) to 7 (very likely).