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RESEARCH ARTICLE

Infants' background television exposure and maternal language input: A home observation study

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Abstract

Parental reports and experimental studies indicate that parents speak less to their children in the presence of background television. However, there is a lack of home observations examining the relations between infants' background TV exposure and maternal infant-directed speech. In the current study, 32 infants and their mothers were observed for 60 minutes in their homes at 8, 10, and 18 months of age. Results revealed that the number of words, the number of different words, and the number of questions in infant-directed speech were consistently lower in households with background TV. Furthermore, these aspects of maternal language input were negatively related to the duration of background TV, controlling for families' socioeconomic background. These findings suggest that television may have a negative impact on young children's language development via disrupted parent–child interactions in the presence of background TV in the home environment.

Keywords: background television; child-directed language; language input; home observation

Özet

Ebeveynlerden alınan bildirimler ve deneysel çalışmalar, arka planda televizyon açıkken ebeveynlerin çocuklarıyla daha az konuştuklarını göstermektedir. Ancak, arka plan televizyon ile ebeveynlerin bebeklerine yönelttikleri dil arasındaki ilişkiyi inceleyen ev gözlemlerine ihtiyaç duyulmaktadır. Bu çalışmada, 32 bebek ve anneleri, bebekler 8, 10 ve 18 aylıkken evlerinde her ziyarette 60'ar dakika boyunca gözlemlenmiştir. Bulgular, arka planda televizyonun açık olduğu evlerde bebeklere yöneltilen dildeki toplam kelime sayısının, farklı kelime sayısının ve soru sayısının tutarlı biçimde daha düşük olduğunu göstermiştir. Ayrıca, bu dil girdisi ölçütleri, ailelerin sosyoekonomik düzeyi kontrol edildiğinde, arka plan televizyon süresiyle olumsuz yönde ilişkili bulunmuştur. Bu bulgular, televizyonun aktif olarak izlenmiyor olsa bile ebeveyn-çocuk etkileşimini sınırlayarak küçük çocukların dil gelişimini olumsuz yönde etkileyebileceğini düşündürmektedir.

Anahtar sözcükler: arka plan televizyon; çocuğa yöneltilen dil; dil girdisi; ev gözlemi

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Television is frequently on in homes with young children, even when no one is actively watching (Lapierre et al., 2012). This phenomenon, known as *background television*, has been associated with negative outcomes in children's vocabulary development (e.g., Hudon et al., 2013; Masur et al., 2016), potentially linked to reduced parent–child interactions during background TV exposure. Experimental studies have previously indicated that the amount of caregiver speech directed to children, a strong predictor of children's language development (Anderson et al., 2021), decreases in the presence of background TV (e.g., Kirkorian et al., 2009). However, the existing literature on the relationship between background TV and parent–child interactions mostly relies on controlled experiments in laboratory settings or parental reports. It is crucial to conduct home observations to examine infants and parents in their natural environment, where parents can freely decide whether and how to use screen media. Currently, there is only one home observation study demonstrating that adults talk less when the TV is on in homes with young children without distinguishing between background and foreground TV (i.e., TV being actively watched) (Christakis et al., 2009). The present study represents the first home observation of its kind, aiming to explore the associations between background TV and the quantity and quality of maternal language directed towards infants at 8, 10, and 18 months of age.

Reports from the United States reveal that young children are consistently exposed to background TV for extended periods on a daily basis. Parents of infants younger than age two have reported durations of background TV exceeding 5 hours daily (Lapierre et al., 2012). Additionally, a significant number of mothers of 11- to 18-month-old infants report having the television on during mother–infant play (92%) and during some parts of infants' solitary play (83%) (Masur & Flynn, 2008). Moreover, a representative sample analysis indicated that 35% of children under the age of six grow up in homes where the television is often or always on (Vandewater et al., 2005). These findings indicate that background TV exposure is a common occurrence in households with young children. However, it is essential to note that socioeconomic differences play a role in children's background TV exposure. Research suggests that children from lower socioeconomic backgrounds tend to be exposed to background TV for more extended periods (e.g., Dore & Dynia, 2021; Pons et al., 2020; Rideout & Robb, 2020; Uzundağ et al., 2022a).

Extensive research demonstrated associations between background TV exposure and a range of adverse outcomes in children under the age of six. These outcomes include sleep problems (Paavonen et al., 2006), less than optimal development in self-regulatory skills (see Uzundağ et al., 2022b, for a review), and attention problems such as restlessness and hyperactivity (Martin et al., 2012). Experimental studies further indicated that background TV disrupts attention in toddlers, leading to briefer toy play episodes and reduced focused attention on toys when the TV is on (Courage et al., 2010; Schmidt et al., 2008; Setliff & Courage, 2011). Studies have also investigated the relationship between children's background TV exposure and language development. While some studies indicate no correlation (e.g., Alroqi et al., 2023; Sundqvist et al., 2021) or even a positive relation (Robb et al., 2009) between background TV and language skills, including receptive and expressive vocabulary in children younger than two, the majority of findings indicate a negative association. Background TV exposure has been linked to lower receptive and expressive vocabulary and syntactic and grammar development in both toddlers and preschoolers (e.g., Bittnam et al., 2011; Hudon et al., 2013; Ribner et al., 2021; Schlesinger et al., 2019). Longitudinal studies provide further evidence of the detrimental influence of background TV on language development. Infants with higher exposure to background TV during mother–infant dyadic play at 13 months exhibited poorer expressive

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vocabulary at 17 months (Masur et al., 2016). Similarly, exposure to TV during family meals at age 2 predicted lower expressive vocabulary at ages 5 and 6 (Martinot et al., 2021). Moreover, recent research has revealed that infants aged 12 to 42 months with language delay were exposed to more background TV compared to infants with typical development (Çelen-Yoldaş & Özmert, 2021). Interestingly, a study conducted by Farangi and Mehrpour (2022) demonstrated that the negative impact of background TV on the receptive and expressive vocabulary of 4- to 6-year-old preschoolers was only evident among children from high socioeconomic backgrounds. Collectively, these findings underscore the potential detrimental influence of background TV on child language development.

Background noise from television can potentially hinder language development in children by diverting their attention from focused objects and relevant language cues, such as object labelling. Moreover, it may interfere with the auditory input directed to the child. This dual impact of disrupted attention and hearing can consequently impair the child's ability to perceive and comprehend language input within their environment. Another potential explanation for the negative associations between background TV and children's language development is its interference with parent–child interactions. Parental responsiveness, shared attention, and the quantity (e.g., number of words) and quality (e.g., number of different words) of parental language input during parent–child interactions are widely acknowledged as crucial elements for language development (Anderson et al., 2021; Carpenter et al., 1998; Hoff, 2003; Tamis-LeMonda et al., 2001, 2004, 2014; Tomasello & Todd, 1983). Experimental studies examining parent–child interactions in laboratory free-play sessions, where mothers are instructed to play naturally with their children using researcher-provided toys, either with the TV on or off, consistently demonstrate that background TV diminishes the quantity and quality of parent–child interactions. Kirkorian et al. (2009, 2019) investigated parents' interactions with toddlers aged 12, 24, and 36 months in the presence and absence of background TV, revealing reduced verbal interactivity, responsiveness, attentiveness, and active involvement in play when background TV was on. The quantity and quality of child-directed speech are also affected, including less talking with 6- and 18-month-old infants (Courage et al., 2010), reduced use of new words, and fewer words and utterances directed at 12-, 24-, and 36-month-old toddlers when background TV is on (Pempek et al., 2014). Moreover, Tanimura et al. (2007) demonstrated that parents were more likely to use one-word sentences, primarily focusing on nouns (e.g., "doggy"), and less likely to provide extended explanations of situations (e.g., "the doggy is sleeping") when the TV was on.

Parental reports of TV exposure complement the findings of experimental studies. For instance, in Lavigne et al., (2015) and Masur et al., (2016), parents reported the typical amount of background TV present in their homes. These reports were then correlated with observed parent–child interactions during laboratory free-play sessions. Results revealed a negative association between the amount of background TV exposure at home and both the number and variety of words mothers used while interacting with their one-year-old infants. These findings indicate a negative association between children's exposure to background TV and the quantity and quality of child-directed speech by parents, potentially leading to poorer language development in children.

Parents play a critical role in determining whether, when, and how to use screen media in their own homes, incorporating screen time into their daily routines alongside other activities. Thus, for a more comprehensive understanding of parent–child interactions and the impact of background TV, observational studies in the home environment are

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crucial. To date, only one home-based observational study based on audio recordings has investigated the relationship between television and parent–child interactions, revealing reduced parental word counts, conversational turns between parents and children, and toddler vocalizations without distinguishing between background and foreground exposure (Christakis et al., 2009). Unlike foreground TV, which involves television as the primary activity for the child, background TV, considered a secondary activity, may distract young children or parents from social interactions by capturing their attention with salient visual and auditory stimuli (Setliff & Courage, 2011). However, the current literature lacks data on the association between children's background TV exposure and the child-directed language input they receive in the natural context of the home.

To address these gaps in the literature, the current study aimed to examine the relations between infants' background TV exposure and the quantity and quality of maternal language input directed to infants at 8, 10, and 18 months of age during one-hour home observations. By conducting these observations in the natural home environment, we sought to capture the dynamics of parent–child interactions while considering the influence of background TV. We focused on maternal language input as mothers consistently assumed the primary caregiving role in all observations. As a well-established indicator of input quantity (Anderson et al., 2021), we used the number of words mothers directed to their infants. As a measure of input quality, we examined the number of different words mothers used in child-directed speech, as this reflects lexical diversity and has been closely linked to children's language development (Anderson et al., 2021). We also included the number of questions mothers asked their infants as an additional indicator of input quality. Questions are a frequent feature of early child-directed speech (Chouinard et al., 2007) and are known to promote conversational turn-taking and interaction (Casillas & Frank, 2017). They also play a critical role in socio-cognitive development by inviting participation, eliciting responses, and scaffolding children's understanding (Butler et al., 2020). Even when infants do not respond verbally, caregivers' questions help establish joint attentional episodes (Bruner, 1985), which are foundational for early language learning. By prompting children to practice language and helping to sustain their attention, questions can support a range of skills, including vocabulary development, turn-taking, and language comprehension (Muhinyi & Rowe, 2019). Consistently, parental use of questions has been linked to children's vocabulary development (e.g., Cristofaro & Tamis-LeMonda, 2012; Luo et al., 2022; Rowe et al., 2017). We hypothesized that both the presence and amount of background TV would be negatively associated with the number of words, the number of different words, and the number of questions in mothers' speech directed to their infants.

While examining the relations between infants' background TV exposure and maternal language input, we also aimed to control for families' socioeconomic status (SES). SES has been shown to correlate with children's exposure to background TV, with children from families with lower SES typically experiencing longer durations of exposure (Rideout & Robb, 2020; Uzundağ et al., 2022a). This pattern may reflect differences in parental attitudes towards screen media; for example, parents with lower income are more likely to view television as an educational tool compared to parents with higher income (Rideout & Robb, 2020). In addition, SES is a well-established predictor of parental language input. Compared to their counterparts with lower SES, parents with higher SES tend to address their children with more words and a greater variety of words, ask more questions, use fewer behavioural directives, engage in more explicit teaching of object names, and talk more about causality (Hart & Risley, 1992; Hoff, 2003; Kurkul & Corriveau, 2018; Rowe, 2012; Schwab & Lew-Williams, 2016). Accordingly, for infants

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from families with higher SES, we expected lower levels of background TV exposure and higher levels of maternal language input, reflected in the number of words, the number of different words, and the number of questions in infant-directed speech. Finally, as an exploratory inquiry, we investigated the stability and changes in infants' background TV exposure over time.

1. Method

1.1. Participants

A total of 56 participants were recruited for a longitudinal study, which aimed to investigate the cognitive, social, and communicative development of typically developing infants (i.e., those born full term and not suspected or reported to have any developmental problems during the study period) from 8 to 18 months of age. The study was conducted in Türkiye between 2016 and 2019 and employed measurements in both laboratory and home settings. Data collection occurred at eight time points when infants were 8, 9, 10, 11, 12, 13, 14, and 18 months old. During the study, approximately one-hour-long home observations were conducted at 8, 10, and 18 months of age, and these observations were utilized in the current analysis.

Due to diagnoses of developmental delay and preterm birth, two participants were excluded from the analyses. In order to ensure data consistency, only infants with at least two consecutive home observations lasting longer than 45 minutes were included in the analyses. Consequently, the final sample consisted of 32 infants (17 girls) and their mothers. The mean age of infants in the first home visit was 8 months 21 days (SD = 12.1 days), followed by 10 months 20 days (SD = 11 days) in the second visit, and 18 months 19 days (SD = 12.9 days) in the third visit. In the sample, 7 mothers had educational attainment lower than high school, 8 had completed high school, 13 had a college degree, and 1 had a master's or doctorate degree. In terms of employment status, 21 mothers were not employed at the time of data collection, while 9 mothers were employed. Information about the three mothers' education and the two mothers' employment status was missing.

1.2. Procedure

At 8 months of age, parents provided informed consent to participate in the study, and demographic information was collected. Home observations were conducted when the children were 8, 10, and 18 months old. During each visit, one of three trained research assistants recorded the family's daily activities for approximately one hour, without initiating communication with any family members. Families were instructed to engage in their typical daily routines and behave naturally during the observations. Caregivers were not given any instructions regarding screen media use or the types of activities they could engage in. To capture parent–child interactions, both a stationary camera and a head-mounted camera worn by the research assistant were used. The head-mounted camera was used to follow the infant if they moved to another room. The stationary camera was set up in the room where the caregiver and infant were located when the assistant arrived at the family's home. For the current study, only recordings from the stationary camera were used, as the television was always located in the same room as this camera. Families received gift cards in exchange for their participation. The study protocol was approved by the ethics committee of [blinded for review] University.

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2. Data coding

2.1. Background television

Television was categorized as background television if it was present in the same room as the infant and considered a secondary activity in comparison to the infant's primary activity, such as toy play (Lapierre et al., 2012). In contrast, when the infant paid overt attention to the TV for at least one minute, this period was classified as foreground TV. During instances when background TV was on, and the infant briefly left the room for less than one minute while the TV remained audible to the infant, this period of time was also coded as background TV.

The coding of background TV was conducted by three coders including the first and second authors and a graduate student of psychology. The coding was performed using ELAN, (2022), a software designed for coding video data. To assess interrater reliability, the coders independently coded the same 10 videos, comprising 3 videos from 8 and 10 months each and 4 videos from 18 months. The intraclass correlation coefficient, based on a two-way random effects consistency model, was calculated to index interrater reliability, resulting in .999.

2.2. Language input

Maternal language input was extracted from the home observation videos. Initially, the videos were transcribed by two trained research assistants adhering to the CHAT manual guidelines (MacWhinney, 2000). Subsequently, the CLAN software (MacWhinney et al., 2011) was employed to calculate the total number of words and the number of different words in maternal infant-directed speech. The number of questions mothers asked was computed using a customized R script that searched the transcriptions for utterances containing questions within maternal speech directed at the infant. The total number of words served as a measure of the *quantity* of infant-directed speech, while the number of different words and the number of questions were used as indicators of the *quality* of maternal language input. For one parent–child dyad, video recordings were not transcribed because family members spoke another language, Kurdish, in addition to Turkish at home. For another parent–child dyad, the video recording of the first home visit was not transcribed due to low sound quality.

2.3. Socioeconomic status

Socioeconomic status was calculated using the SES index developed by Berzofsky et al., (2014), which incorporated standardized summary metrics of maternal education, maternal employment status, and household income. Maternal education was categorized on a four-point scale ranging from 0 to 3 (0 = less than high school; 1 = high school degree; 2 = college degree; and 3 = masters or doctorate degree). Maternal employment status was coded as either 0 = not employed or 1 = employed. Note that we used household expenditure instead of the income variable in Berzofsky et al., (2014). Past research conducted in Türkiye has utilized household expenditure as a measure of economic status (Baydar & Akcinar, 2015). Additionally, household income and expenditure are positively correlated in families living in Türkiye (Alp & Seven, 2019). Thus, household expenditure, which serves as an indicator of economic well-being, was used instead of household income in this study. Household expenditure was coded on a three-point-scale as follows: 0 = between 1200 and 3000 ₺ ($n = 15$), 1 = between 3000 and 5000 ₺ ($n = 9$), and

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2 = more than 5000 ₺ (n = 6). Household expenditure information was missing for two participants.

3. Data analysis

As the duration of the videos showed some variation ($M(SD)$ = 56.9(7.5) minutes, *range* = 27.5–64.2 minutes)[1], variables were converted into proportions relative to video duration to allow comparability across participants. Specifically, the proportion of background TV duration reflects the amount of time the background TV was on during the video (in seconds), divided by the total video duration (in seconds). Similarly, the quantity and quality of maternal speech variables represent the number of observed maternal utterances in each category, divided by the total video duration (in seconds). These proportion values were used as continuous variables in all analyses. Prior to the analyses, data were screened for outliers (i.e., data points outside the M +/− 3*SD range) in terms of maternal language input, and no outliers were identified. Regarding the normality checking of data, the Shapiro–Wilk test was performed and showed no evidence of normality ($p < .05$); therefore, nonparametric tests were employed for all statistical analyses.

To compare maternal language input between homes with and without background TV, nonparametric Kruskal–Wallis H tests were conducted at each time point (i.e., 8, 10, and 18 months). Additionally, nonparametric Kendall's Tau correlations were used at each time point to assess the associations between the duration of background TV exposure and maternal language input. These analyses were then repeated using partial Kendall's Tau correlations, controlling for SES. Finally, to examine the stability and change in background TV exposure and maternal language input across time, nonparametric repeated-measures Friedman tests were conducted.

4. Results

In this section, we demonstrate descriptive statistics and report our findings regarding maternal language input in homes with and without background TV, as well as the correlations between background TV exposure, maternal language input, and SES at each time point. Subsequently, we examine the results of partial correlation analyses, where we control for families' SES. Finally, we present the stability and changes observed in background TV and maternal language input over time. The descriptive statistics of background TV and maternal language input across three time points are presented in Table 1.

Table 2 provides the means and standard deviations for the quantity and quality of maternal speech in the presence and absence of background TV. To compare maternal language input across homes where infants were or were not exposed to background TV, Kruskal–Wallis H tests were conducted at each time point. As expected, at 8 months, all three indicators of maternal infant-directed speech were significantly higher in homes without background TV compared to those with background TV. Specifically, mothers in

[1]Only infants who had a minimum of two consecutive home observations, each lasting longer than 45 minutes, were included in the analyses. Among the participants, five infants had two consecutive home observations lasting longer than 45 minutes, and an additional home observation that was shorter in duration. As a result, the minimum duration for the home recordings was 27.5 minutes.

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Table 1. Descriptive statistics

	8 months				10 months				18 months			
	N	M(SD)	Min	Max	N	M(SD)	Min	Max	N	M(SD)	Min	Max
Home Observations	30				32				31			
Background TV Present	11 (36.7%)				14 (43.8%)				11 (35.5%)			
Background TV Duration*	30	0.25(0.40)	0	1	32	0.21(0.32)	0	0.97	31	0.17(0.31)	0	1
Number of Words*	28	0.28(0.21)	0.03	0.87	31	0.35(0.25)	0.01	0.90	30	0.44(0.26)	0.06	1
Number of Different Words*	28	0.09(0.07)	0.01	0.30	31	0.11(0.07)	0.01	0.30	30	0.14(0.08)	0.04	0.39
Number of Questions*	28	0.02(0.02)	0.00	0.05	31	0.03(0.02)	0.00	0.11	30	0.04(0.02)	0.00	0.09

*Proportion values represent the variable of interest divided by the total duration of the home observation video (in seconds), allowing for standardization across observations of varying lengths.

Table 2. Maternal infant-directed speech according to background TV exposure

	M(SD)					
	8 months		10 months		18 months	
	Present	Absent	Present	Absent	Present	Absent
Number of Words	0.15(0.08)	0.36(0.23)	0.22(0.23)	0.44(0.23)	0.22(0.12)	0.55(0.25)
Number of Different Words	0.05(0.02)	0.12(0.07)	0.07(0.07)	0.13(0.07)	0.08(0.03)	0.17(0.07)
Number of Questions	0.01(0.01)	0.03(0.02)	0.01(0.01)	0.04(0.03)	0.02(0.02)	0.04(0.02)

homes without background TV used a greater number of words ($\chi^2(1) = 8.64$, $p = .003$, $\varepsilon^2 = .32$), a greater number of different words ($\chi^2(1) = 7.32$, $p = .007$, $\varepsilon^2 = .27$), and asked more questions ($\chi^2(1) = 6.33$, $p = .012$, $\varepsilon^2 = .23$). Similarly, the differences at 10 months (number of words: $\chi^2(1) = 9.26$, $p = .002$, $\varepsilon^2 = .31$; number of different words: $\chi^2(1) = 7.41$, $p = .006$, $\varepsilon^2 = .25$; number of questions: $\chi^2(1) = 9.75$, $p = .002$, $\varepsilon^2 = .32$) and 18 months (number of words: $\chi^2(1) = 12.1$, $p < .001$, $\varepsilon^2 = .42$; number of different words: $\chi^2(1) = 11.8$, $p < .001$, $\varepsilon^2 = .41$; number of questions: $\chi^2(1) = 8.69$, $p = .003$, $\varepsilon^2 = .30$) were significant. Based on commonly used benchmarks (Tomczak & Tomczak, 2014), the effect sizes were consistently large across time points, indicating robust differences in maternal speech associated with the presence of background TV.

Table 3 demonstrates the correlations between the study's variables. As hypothesized, a higher proportion of background TV was related to fewer words, fewer different words, and fewer questions in mothers' speech directed to their infants at all time points (Information regarding foreground TV is provided as Supporting Information S1).

As expected, SES was positively associated with aspects of maternal language input at all time points, except for the number of different words at 8 months. In addition, SES was negatively associated with infants' background TV exposure at 8 months, but no significant associations were observed at 10 or 18 months. Since SES was significantly correlated with both infants' background TV exposure and maternal infant-directed speech at 8 months, partial correlation analysis, controlling for SES, was conducted. At 8 months, the analysis confirmed that background TV exposure remained negatively associated with all three measures of maternal language input, namely, the number of words ($\tau = -.38$, $p = .008$), the number of different words ($\tau = -.36$, $p = .013$), and the number of questions ($\tau = -.44$, $p = .002$).

Finally, the stability and change in background TV and maternal language input over time were examined. Repeated-measures Friedman tests revealed that the proportion of time background TV was on did not exhibit a significant change across the time points, $\chi^2(2) = 0.89$, $p = .64$. Furthermore, background TV displayed a consistent positive correlation across all time points, suggesting stability (see Table 3). In contrast, differences in maternal language input over time were observed. Specifically, the quantity of maternal infant-directed speech exhibited a significant change across time, $\chi^2(2) = 9.56$, $p = .008$, primarily driven by increases from 8 to 18 months ($p = .003$) and from 10 to 18 ($p = .011$) months. There were also significant changes in the number of different words ($\chi^2(2) = 15.4$, $p < .001$) and the number of questions ($\chi^2(2) = 13.6$, $p = .001$). A similar pattern emerged, with significant increases observed from 8 to 18 ($p < .001$ for both

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Table 3. Correlations among study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SES	–												
8 months													
2. Background TV	−.37*	–											
3. Number of Words	.30*	−.46**	–										
4. Number of Different Words	.22	−.42**	.79***	–									
5. Number of Questions	.30*	−.36*	.72***	.59***	–								
10 months													
6. Background TV	−.23	.52***	−.43**	−.37*	−.43**	–							
7. Number of Words	.45**	−.46**	.56***	.53***	.60***	−.42**	–						
8. Number of Different Words	.44**	−.46**	.53***	.59***	.54***	−.39**	.82***	–					
9. Number of Questions	.52***	−.43**	.49***	.43**	.58***	−.46***	.78***	.68***	–				
18 months													
10. Background TV	−.01	.47**	−.39*	−.38*	−.30*	.53***	−.32*	−.36*	−.22	–			
11. Number of Words	.30*	−.54***	.51***	.50***	.43**	−.55***	.54***	.52***	.45***	−.48***	–		
12. Number of Different Words	.32*	−.53***	.59***	.55***	.45***	−.50***	.54***	.54***	.46***	−.49***	.86***	–	
13. Number of Questions	.33*	−.54***	.38**	.34*	.38**	−.55***	.48***	.40**	.51***	−.41**	.73***	.70***	–

*$p < .05$,
**$p < .01$,
***$p < .001$.

quality measures) and from 10 to 18 ($p = .003$ for the number of different words; $p = .025$ for the number of questions) months. Both the quantity and quality of maternal infant-directed speech displayed a positive correlation across all time points, as indicated in Table 3.

5. Discussion

In this pioneering home observation study investigating the correlation between background television exposure and maternal infant-directed speech at 8, 10, and 18 months of age, we discovered that the number of words, the number of different words, and the number of questions in mothers' speech directed to their infants were lower in homes where background TV was present. Furthermore, these aspects of maternal language input exhibited a negative association with the duration of infants' exposure to background TV. This correlation persisted even after accounting for the variability in families' socioeconomic backgrounds. Aligned with prior experimental findings highlighting a decline in parents' responsiveness, active involvement in play, and language input, these cross-sectional correlations suggest that television has the potential to diminish parent–infant interactions – essential contributors to children's language development.

The presence of background TV can significantly reduce the quantity and quality of parental language directed towards infants, primarily because of its distracting nature. When the TV is on, parents' attention may be diverted away from their infants, leading to a decrease in direct interaction and verbal communication (Kirkorian et al., 2009, 2019). The visual and auditory stimuli from the TV may compete with and disrupt the natural flow of parent–infant conversations, potentially resulting in communication breakdowns (Pempek et al., 2014). Additionally, the cognitive load on parents may increase due to the simultaneous processing of TV content and engagement with their infant, which can further impair effective communication patterns. Alternatively, parents who naturally engage in less conversation with their children might be more inclined to use background TV, implying a correlation rather than a causative effect of TV on reduced parental language.

Previous research established links between background TV exposure and adverse language outcomes in infants, toddlers, and preschoolers (e.g., Hudon et al., 2013; Masur et al., 2016; Ribner et al., 2021). Based on the experimental findings showing that parents were less responsive, less attentive, and less verbally interactive with their children when the background TV was on (e.g., Kirkorian et al., 2009, 2019), it was suggested that this negative association may stem from the indirect effect of background TV on the language development of children, such that it interferes with infants' interactions with caregivers. The present study also demonstrates a negative association between children's background TV exposure and the quantity and quality of maternal language input and thus supports this potential explanation by providing evidence via observations in the natural home environment. The uniformity across these findings raises a significant concern: Background TV, prevalent in many households, may inadvertently compromise the home's linguistic environment, which is crucial for fostering early language skills.

The current study extends prior literature by examining the stability and change in background TV duration over time. There were no significant changes in the amount of background TV over time, and infants' exposure to background TV was significantly correlated across different time points. These findings suggest that background TV may represent a stable "household habit" that remains unchanged over time, regardless of

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factors such as child age. The stability and change in maternal language input were also investigated. The number of words, the number of different words, and the number of questions in mothers' speech directed to their infants were significantly correlated over time, suggesting a certain degree of stability. On the other hand, significant changes were observed in these aspects of maternal language, with increases between 8 to 18 months and 10 to 18 months, indicating enhanced communication as infants age. No changes were observed from 8 to 10 months, possibly because of the short interval between assessments. Echoing prior research (e.g., Rowe, 2012; Suttora & Salerni, 2011), these results indicate that individual differences in parental child-directed language remain stable over time, with parents tending to speak more and use a wider variety of words as their children grow older.

Past studies have consistently shown that individual differences in parental language are highly correlated with SES. Parents from high-SES backgrounds are more likely to direct a greater amount of language, more diverse words, and more complex language to their children than parents from low-SES backgrounds (e.g., Rowe, 2018; Vernon-Feagans et al., 2020). As a control variable, we integrated families' socioeconomic backgrounds into the analyses. Consistent with previous research, SES exhibited a significant positive association with infant-directed speech produced by mothers. The recurring finding in the literature that child-directed speech from caregivers with higher SES surpasses that of caregivers with lower SES in both quantity and quality is supported by our results as well (Hoff, 2003; Schwab & Lew-Williams, 2016). Notably, the lack of a significant correlation between SES and the number of new words in maternal language input at 8 months might suggest that SES differences in caregiver input become more pronounced as infants age and develop communicative skills (Rowe, 2012). Although SES correlated with the duration of infants' background TV exposure at 8 months, this correlation was not significant at 10 and 18 months. The absence of a significant correlation aligns with some prior findings (Vandewater et al., 2005) but contrasts with the majority of other studies (e.g., Gago-Galvagno et al., 2023; Uzundağ et al., 2022a). These mixed findings in the literature suggest that the relationship between SES and background TV may be influenced by other variables, such as parental responsiveness, well-being, and household size.

Previous research often relied on parental reports to assess background TV, but it is acknowledged that adults may either over- or underestimate their own and their children's screen media use (Hodes & Thomas, 2021; Radesky et al., 2020). This home observation study contributes to the literature by utilizing video recordings to examine parent–child interactions in a naturalistic environment. The longitudinal design enables the analysis of the change and stability of background TV and maternal language input over time. While the small sample size may be a limitation, the variability in families' socioeconomic backgrounds enhances the generalizability of the findings. However, 48% of the mothers in our sample held at least a bachelor's degree, a proportion notably higher than the national average of 22.7% (Turkish Statistical Institute [TÜİK], 2024). In contrast, 30% of mothers in the sample were employed, which is comparable to the 27.1% employment rate among mothers with children under age 3 in the general population (TÜİK, 2024). Given previous research indicating that higher parental education is associated with lower background TV exposure at home (Lapierre et al., 2012; Nichols, 2022), the media usage patterns observed in this study may underestimate those present in the broader population. These considerations highlight the need for future research to include larger and socioeconomically even more diverse samples.

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Although our results suggest a relationship between infant-directed speech and infants' background TV exposure, third variables may contribute to this association. For instance, it remains unclear whether parents are less responsive, more distracted, or whether the auditory properties of the TV interfere with speech perception during background TV exposure. Prospective studies with larger sample sizes could employ cross-lagged analyses, considering these potential variables. Additionally, due to the naturalistic and unstructured nature of our home observations, background TV exposure was not experimentally manipulated, and the TV tended to remain either on or off for the entire observation period. As such, within-dyad comparisons (e.g., contrasting behaviour when the TV was on versus off within the same session) were not feasible in our dataset. This limitation should be considered when interpreting the results, and future studies should employ repeated-measures designs in naturalistic settings to further clarify these effects.

Another limitation concerns the potential variability in the types of activities occurring during the home observations. While the extended, one-hour observation periods allowed us to capture a diverse range of daily routines, including mealtime, play, diaper changes, and household chores, the activity context was not formally coded. It is therefore possible that certain activities co-occurred more frequently with background TV exposure, which could partially account for the observed associations. Future studies should include systematic coding of activity types to examine whether specific routines moderate the relationship between background TV and parental language input. Finally, the presence of a research assistant at home may have influenced the amount of parent–child interactions during the visit, potentially by attracting the infant's attention or prompting parents to modify their behaviour due to observation-related concerns. However, the substantial variability in maternal speech suggests that individual differences were captured in the data. It should also be noted that the developmental benefits of questions may depend on their form and context. For instance, high frequencies of yes/no questions may not support engagement or language development as effectively as open-ended questions and may lead to fatigue and disengagement on the part of the child. The contingency of questions on the current interaction could be a key factor rather than their form. Accordingly, our measure of the number of questions should be interpreted as a broad index of interaction rather than a definitive marker of the quality of child-directed interaction across contexts.

The findings from this home observation study underline the necessity for enhanced awareness and deliberate interventions aimed at minimizing background television exposure in households with infants. Educational initiatives for parents can stress the significance of active engagement and direct verbal interaction with their infants, delineating the adverse effects of background TV on such exchanges. These programs can guide parents in establishing an environment that better supports language development by recommending activities that enhance parent–infant interactions without the distraction of background TV. Addressing socioeconomic differences is crucial, as these interventions have the potential to provide specialized support and resources to families who may depend more on background TV, possibly due to restricted access to other engagement and entertainment options for their young children.

In conclusion, the current study demonstrated a negative relationship between background TV exposure and maternal language input. This study contributed to the field by emphasizing the invaluable insights gained from observing interactions in real-world home environments. It underscores the urgency of comprehending the repercussions of background TV on parent–child dynamics, particularly in natural settings. By shedding

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light on how background TV compromises essential elements of parental engagement crucial for infant language development, our research underscores the necessity for interventions and policies aimed at reducing background TV exposure in households with young children.

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/S0305000925100391.

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Competing interests. The authors declare none.

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