MIND, BRAIN, AND EDUCATION

Supermarket Speak: Increasing Talk Among Low-Socioeconomic Status Families

Katherine E. Ridge[1], Deena Skolnick Weisberg[1,†], Hande Ilgaz[1,‡], Kathryn A. Hirsh-Pasek[1], and Roberta Michnick Golinkoff[2]

ABSTRACT— Children from low-socioeconomic status (SES) families often fall behind their middle-class peers in early language development. But interventions designed to support their language skills are often costly and labor-intensive. This study implements an inexpensive and subtle language intervention aimed at sparking parent–child interaction in a place that families naturally visit: the supermarket. We placed signs encouraging adult–child dialogue in supermarkets serving low- and mid-SES neighborhoods. Using an unobtrusive observational methodology, we tested how these signs affected adult–child interactions. When signs were present in supermarkets serving low-SES neighborhoods, both the amount and the quality of talk between adults and children increased significantly, compared to when the signs were not present; signs had little effect in middle-SES supermarkets. This study demonstrates that implementing simple, cost-effective interventions in everyday environments may bolster children's language development and school readiness skills.

Children from low-socioeconomic status (SES) backgrounds often have different language trajectories than children of upper-SES backgrounds. Low-SES children trail nearly half a standard deviation (0.47) behind mid-SES children and 1.17 standard deviations below high-SES children on standard language measures at the start of kindergarten (Lee & Burkham, 2002). Gaps between children of low- and high-SES on various measures of language ability are consistently found early in life, with disparities in comprehension evident as early as 9 months (Halle et al., 2009) and in processing and production measures in toddlerhood (Fernald, Marchman, & Weisleder, 2013; see Hoff, 2006 for a review). These language differences are strong predictors of school readiness and academic achievement (Dickinson & McCabe, 2001; Gershoff, 2003). Because of the importance of language skills in development, we report the results of a novel, low-cost intervention aimed at increasing adult–child linguistic interaction.

We chose to focus on adult–child conversations because these are the main sources from which young children learn vocabulary and linguistic skills. Conversations with adults help children learn facts and concepts, encourage them to express their ideas through language, and help them learn to ask questions. These behaviors all build more complex ideas and concepts (Neuman, 2001). Contingent interactions with sensitive and responsive adults, like those in conversations, are an especially important component of language development (Roseberry, Hirsh-Pasek, & Golinkoff, 2014; Tamis-Lemonda, Bornstein, & Baumwell, 2001; Tamis-LeMonda, Bornstein, Baumwell, & Damast, 1996). Indeed, verbal responsiveness directly predicts concurrent and subsequent language development. Thirteen-month-old infants whose parents are more verbally responsive show earlier onset of their first word and of their first fifty words (Tamis-LeMonda et al., 1996).

[1]Department of Psychology, Temple University
[2]School of Education, University of Delaware

Address correspondence to Katherine E. Ridge, Institute of Child Development, University of Minnesota, 51 East River Parkway, MN 55455; e-mail: ridg0053@umn.edu.

[†] Present address: Department of Psychology, University of Pennsylvania, Philadelphia, 3401 Walnut Street, PA 19104
[‡] Present address: Department of Psychology, Bilkent University, Bilkent 06800, Ankara, Turkey

Conversations between parents and children from low-SES backgrounds appear to be less frequent in comparison to conversations between parents and children from higher SES backgrounds, as well as less interactive. In particular, low-SES parents tend to use more directives, ask fewer questions, and engage less in conversation with their children (Hart & Risley, 1995; Rowe, 2008). Although mothers' directive speech has been positively correlated with children's later vocabulary in low-income African American mother–child dyads (Shimpi, Fedewa, & Hans, 2012), the use of directives (e.g., "Don't touch that") limits the amount of verbal interaction between the parent and child. Directives often close a conversation, while questions elicit a verbal response from the child and encourage more conversational turns (Hoff-Ginsberg, 1992).

Furthermore, conversations in low-income homes are often characterized by shorter utterances and fewer diverse lexical items, often resulting in children having smaller vocabularies (Hoff, 2003). Data from Hart and Risley (1995) further support the relationship between utterance length, SES, and vocabulary development. These researchers estimate that the high-SES children observed in their naturalistic study heard approximately 11,000 utterances a day, whereas low-SES children heard approximately 700 utterances a day. Additionally, high-SES parents are more likely to utilize conversations as opportunities to teach their children about the world, providing more information about objects and events than low-SES parents (see also Lawrence & Shipley, 1996). These differences manifest themselves in later measures of academic success. Skills necessary to reading comprehension, such as phonological awareness and letter knowledge, are less well-developed in low-SES children (Bowey, 1995; Noble, Farah, & McCandliss, 2006).

In addition to these well-documented effects of SES on language development, there is also neuroscientific evidence that provides an underlying mechanism for these differences (see Hackman & Farah, 2009, for review). For example, babies growing up in poverty have lower volumes of gray matter in their frontal and parietal lobes, and differences between lower and higher SES babies increase over time (Hanson et al., 2013). More to the point, SES differences are strongly evident in the left perisylvian system, which is used in language processing (Noble, Norman, & Farah, 2005). Because healthy neural development relies on linguistic and social interactions (Blakemore, 2010; Kuhl, 2010), these findings support the notion that children growing up in lower SES households can derive important benefits from language-based interventions like the one implemented in this study.

These results suggest that lack of conversational input puts children from low-SES background at a disadvantage. However, some researchers have argued that low-SES children are not deficient per se in their language skills but that they simply have different linguistic skills than upper-SES children. For instance, low-SES families have been shown to highly value and avidly practice oral storytelling with children who often arrive at school with strong narrative skills (see Miller, Cho, & Bracey, 2005). Moreover, low-SES children often acquire other skill sets, such as improvisational and rhythmic skills used in ritualized teasing exchanges (Abrahams, 1962). These results demonstrate a need to be sensitive to how linguistic skills are assessed. Furthermore, there is variability within low-SES children and a small proportion do achieve good language outcomes (Hirsh-Pasek et al., in press). Nevertheless, while low-SES children may have mastered the language styles and skills appropriate in their homes and communities, the trajectory of many low-SES children often places them at an educational disadvantage when they enter formal schooling. Researchers should work to develop interventions that strengthen and add to low-SES children's repertoire to help them reach their maximum potential (see Hoff, 2013 for a lengthier discussion).

With nearly one in every four children living in poverty in the United States (National Center for Children in Poverty, 2010), there is an urgent need for intervention programs to address the frequency and quality of parent–child communication. Increasing the amount and richness of parent–child conversation can combat language disparities between low-SES children and their high-SES peers (Cristofaro & Tamis-LeMonda, 2011; Weisleder & Fernald, 2013). Early childhood interventions have been successful at enriching parent–child interactions, which in turn promote cognitive skills, language development, and school readiness (Administration for Children and Families, 2003; Deutscher, Fewell, & Gross, 2006; Lugo-Gil & Tamis-LeMonda, 2008; Ramey & Ramey, 2004; Rodriguez & Tamis-LeMonda, 2011).

One intervention (Deutscher et al., 2006), for example, offered twenty-four 1-hr training sessions across 3 months on topics related to healthy child development, including effective mother–child interaction, how to read a child's cues and respond appropriately, and other techniques to facilitate early language development. In contrast to mothers who only attended parenting classes required by high school curriculum, mothers who attended the training sessions (mean = 66%) were more likely to talk with their children, used fewer directives, responded more to children's conversational initiations, and engaged longer in interactive dialogues (Deutscher et al., 2006). Similar short but intensive interventions (e.g., 6-week-long programs) also appear to be effective in promoting maternal responsiveness and sensitivity (e.g., McGillion, Herbert, Pine, & Matthews, 2014; Wadsby, Sydsjö, & Svedin, 2001). Although these interventions were successful, such programs are often costly, time-consuming, labor-intensive, and often require the parent and child to visit a specific location or allow

researchers into their home. Not surprisingly, such programs have high attrition rates diluting the effectiveness of the intervention—even in successful programs (Deutscher et al., 2006; Osofsky, Culp, & Ware, 1988; Wagner, Spiker, & Linn, 2002).

In contrast, this study implements a new form of intervention that might increase parent–child conversation in a place families naturally visit: the supermarket. Using supermarkets to deliver interventions is supported by previous research in other informal settings. For example, children's museums encourage children and parents to collaborate, solve problems, generate and interpret evidence, build theories together, and converse (Crowley & Callanan, 1998; Crowley et al., 2001). While museums and other family-oriented institutions, such as zoos and aquariums, are especially ripe for parent–child conversation, they also cost money to enter. By conducting our intervention in an informal, everyday environment where families often go, we are more likely to reach families and promote parent–child verbal interaction. As Kremer-Sadlik and Paugh (2007) note, parents often overlook everyday moments at home, on the drive to school, or in the supermarket when they could be supporting their children's language development. Even in a supermarket line, parents and children can have shared, rich conversation by taking conversational turns and expressing positive affect (Hoff, 2006; Veneziano, 2010). Harnessing small, everyday moments of communication could be one key way to support children's language development.

This study aimed to provide preliminary data on a novel, subtle intervention designed to spark low-SES parent–child interactions in supermarkets. We posted colorful signs with open-ended questions that parents could use to initiate conversation with their children. We are aware of no other intervention that promotes parent–child conversation in low-SES families' everyday environments. We hypothesized that when signage was posted, adult–child conversations would increase in frequency, include more positive affect, and contain more participation from both adult and child.

If this manipulation increases the amount of talk in lower SES families, it has the potential to improve the language development of many young children living in impoverished communities. By meeting parents where they naturally go, rather than by asking them to travel to an additional destination like a school or clinic, we aim to turn an everyday environment into a potential opportunity for enriched parent–child interactions.

METHOD

Participants

Our sample contained 71 adult–child groups that consisted of least one adult and at least one child. The adult–child groups did not necessarily have to include a *parent*, as opposed to a grandmother or caregiver, as we never directly gathered relationship information from the participants. Any adult accompanying a child seemingly in the targeted age range (1–8 years of age) was included. Given the naturalistic, unobtrusive nature of this observational study, we were not required to collect informed consent or debrief participants.

Observations were carried out in three different supermarkets of varying SES levels as determined by the median household incomes of the populations served and the percentage of residents living beneath the poverty line within and in the surrounding zip codes of the store. One supermarket was located in a low-SES community, North Philadelphia, PA, where the median household income is $22,297 and 28.68% live below poverty level. Two other stores were located in two mid-SES communities: Drexel Hill, PA (median income = $72,754; 6.25% below poverty level) and Wilmington, DE (median household income = $44,867; 9.25% below poverty level; U.S. Census Bureau, 2012).

Store Serving Low-SES Community

Thirty-seven groups were observed: 20 in the Sign Up condition and 17 in the Sign Down condition. We observed 25 male children (14 in Sign Up) and 19 female children (10 in Sign Up). The children were estimated by experienced coders to be between 2.5 and 8 years of age (Sign Up $M = 5.4$ years; Sign Down $M = 4.8$ years). Thirty-four of the adults were women and four were men. There were more individuals than the total number of groups because some groups had multiple children or adults shopping together (4 in Sign Up; 3 in Sign Down). Thirty-six groups appeared to be African American; one group Caucasian. Because this was an observational study, we included all *groups* of adults and children who shopped near our signs rather than restricting our observations to adult–child dyads only.

Stores Serving Mid-SES Communities

Thirty-four groups were observed: 17 in Sign Up and 17 in Sign Down conditions. We observed 20 female children (10 in Sign Up) and 21 male children (10 in Sign Up), and estimated ages were between 1 and 8 years (Sign Up $M = 4.1$ years; Sign Down $M = 5.2$ years). Overall, we observed 27 female adults and 9 male adults. Again, there are more individuals than the total number of groups because some groups had multiple children or adults. Of these 34 groups, 24 groups were dyads and 10 groups included more than one adult or more than one child. Of the 24 dyads, 18 included only a female adult and 6 included only a male adult. Of the 10 groups, 7 included two children and one adult (3 in Sign Up) and 3 included one child and two adults (1 in Sign

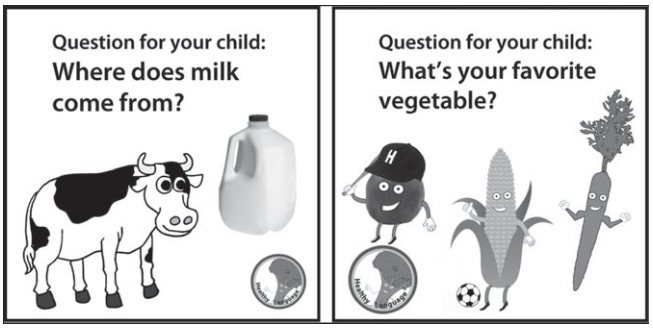

Fig. 1. Examples of signs posted in either the milk or frozen vegetables section of the supermarkets.

Up). Twenty-nine adult–child groups appeared to be Caucasian, four groups appeared to be African American, and one group appeared to be Asian.

Procedure

Stimuli

At the entrance of the store, we posted a large, colorful sign (24″ × 36″) with a statement encouraging parents to engage in conversations with their child ("Talking to your child helps their language grow!") in both conditions. During observation sessions in the Sign Up condition, we additionally posted two signs (18″ × 18″) on cooler doors, one for frozen vegetables and one for milk (Figure 1). There were four signs total: two signs associated with each object (milk or frozen vegetables), each of which had a different question that an adult could use to engage a child (Figure 1). The signs were rotated for each observation session. In the milk section, signs had a color image of a cartoon cow and a gallon of milk and a question ("Question for your child: Where does milk come from?" or "Why is milk good to drink?"). In the frozen vegetables section, signs had color images of cartoon vegetables and a question ("Question for your child: What's your favorite vegetable?" or "Why are vegetables good to eat?").

Observing Adult–Child Interaction

Researchers acted as though they were customers shopping for groceries while discreetly observing each adult–child group. Observers thus blended into the activities of the store and captured naturalistic interactions (Atkin, 1978), maximizing the ecological validity of the study.

Before beginning data collection, we visited the stores to create a coding instrument for the behaviors of each adult and child group that we call the "Total Interaction Score." This score comprised 11 recorded behaviors. Two were general conversation descriptors: Approximate Number of Conversational Turns (None, 1–9, or 10 or more) and Valence (positive, negative, or neutral). Six were adult behaviors directed toward the child: Points to Object, Takes and Shows Object, Says Name of Object, Asks Questions About Object (e.g., "What can we eat with this?"), Provides Information About Object Use (e.g., "We can make stir fry with this edamame."), and Describes Features of the Object (e.g., "We need the big jug [of milk] with the green lid."). The final three were child behaviors: Asks Adult to Stop Cart Near the Sign or Target Object, Points to Object, and Asks Questions ("Why do we drink [milk]?"). We chose these 11 behaviors based on the Dyadic Parent–Child Interaction Coding System, a validated and standardized system to assess quality of parent–child social interaction (Eyberg, Nelson, Ginn, Bhuiyan, & Boggs, 2013), as well as on other research on quality parent–child interaction (e.g., Cristofaro & Tamis-Lemonda, 2011; Hoff, 2006; Rowe, 2008; Tamis-LeMonda et al., 1996).

Five observers were trained for approximately 5 hr each on discreet observation techniques before collecting any data. Due to the nature of the study, observers were not blind to the conditions they were observing, but were blind to the research hypotheses. During piloting, two researchers observed five adult–child groups of the targeted demographic at the same time in order to calculate inter-rater reliability. Pearson's correlation indicated high agreement among observers on the total interaction scores of 25 adult–child groups, $r(23) = .95$, $p < .01$.

During the study, a single trained researcher, assigned to either the frozen vegetables or the dairy section, filled out an observation sheet for each adult–child group. Observation sessions were approximately 90 min long, with or without signs posted. Observations were conducted mainly on weekends and on some weekdays, roughly between the hours of 11 a.m. and 6:30 p.m., on store managers' advisement that this was when they normally saw the most families shopping. The observers were present at the stores for approximately 27 total hours across 9 days to complete all observations.

RESULTS

Coding

A total interaction score was computed for each adult–child group. This score was comprised of the 11 recorded behaviors previously described and aggregated as follows: The item *Approximate Number of Conversational Turns* had three levels, grouped by the estimated number of turns that occurred during the conversation between the adult and child. Estimates were used here because our observers could not reliably track the exact number of conversational turns. The adult–child group was awarded 0 points for 0 turns, 1 point for 1–9 turns, and 2 points for 10 or more turns. We based these cutoffs on our piloting of the coding instrument; the average number of conversational turns fell between 1 and 9 turns. The item *Valence* referred to

the overall affect of the interaction: 1 point for positive affect, 0 points for neutral affect, and −1 point for negative affect.

For the six adult behaviors and the three child behaviors, groups were given 1 point if they engaged in the behavior and 0 points if they did not, giving each behavior a range of 0 to 1 points. In summary, the total interaction score had a minimum value of −1 (which would indicate that no behaviors of these types were observed and the overall valence of the interaction was negative) and a maximum value of 12 (which would indicate that behaviors of all of these types were observed and the overall valence of the interaction was positive). See Tables 1 and 2 for mean score and frequencies of each variable included in the total interaction score.

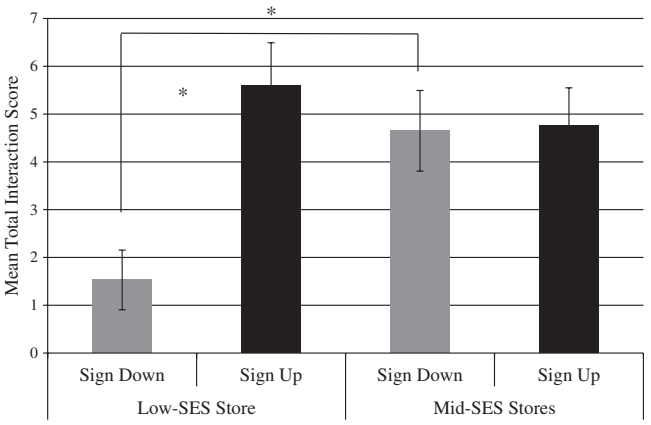

Fig. 2. Difference between mean total interaction scores in Sign Up versus Sign Down conditions in low- and mid-socioeconomic status (SES) stores; $^{*}p < .01$. ($N = 71$).

Analyses

The sample was split into two approximate age groups to examine whether groups shopping with older children (6 years of age and older) interacted differently than groups with younger children, as older children could possibly read the signs themselves. Across both SES levels, there were 23 groups with a younger child and 14 groups with an older child in Sign Up and 23 groups with a younger child and 11 groups with an older child in Sign Down. An independent samples *t*-test found no significant differences in the total interaction score based on whether a group contained older or younger children, $t(69) = -.53$, $p = .50$. Further analyses collapsed across these categories.

We first analyzed differences in the total interaction scores between the Sign Up and Sign Down conditions by SES. A two-factor ANOVA on sign condition and SES level revealed a significant main effect of sign condition, $F(1,67) = 6.76$, $p = .01$ but no main effect of SES level; $F(1,67) = 2.01$, $p = .16$. However, there was an interaction between SES and sign condition; $F(1,67) = 6.02$, $p = .02$ (Figure 2). To examine this interaction, we conducted *t*-tests on the mean scores for all four groups. Scores when signs were posted in the low-SES store ($M = 5.60$, $SD = 3.99$) were significantly higher than the scores when signs were not posted ($M = 1.53$, $SD = 2.58$), $t(35) = 3.61$, $p = .001$. In contrast, there was no significant difference in mean scores between conditions in the mid-SES stores, M Sign Up = 4.77, $SD = 3.21$; M Sign Down = 4.65, $SD = 3.48$; $t(32) = .10$, $p = .92$.

We additionally compared overall levels of interaction between the two SES groups within each condition. An independent samples *t*-test found that, when signs were *not* posted, low-SES families talked significantly less than mid-SES families; $t(32) = -2.97$; $p = .01$. However, when signs were posted, low-SES families did not differ from mid-SES families; $t(35) = .69$; $p = .49$ (Figure 2). Because participants responded differently to the signs in the low- and mid-SES stores, we performed additional analyses separately by community type.

Store Serving Low-SES Community

A Pearson chi square revealed a difference in the estimated number of conversational turns in the adult–child interactions when signs were up versus down, χ^2 $(2, N = 37) = 8.395$, $p = .02$. When signs were posted, adult–child interactions tended to have 10 or more conversational turns (65% or 13 of 20 groups). In contrast, when signs were not posted, the most frequent response was no adult–child interaction at all (47.1% or 8 of 17 groups). A Pearson chi square also found a significant difference in the valence of interaction when signs were up versus down, χ^2 $(2, N = 37) = 12.73$, $p = .002$, such that signs were associated with positive adult–child interactions (70% or 14 of 20 groups) compared to neutral interactions when signs were not posted (76.5% or 13 of 17 groups).

Adult–child groups exhibited more of the target behaviors when signs were posted than when they were not. To examine which behaviors were displayed when signs were posted versus when they were not, we used Pearson chi squares to compare frequencies. When small numbers prohibited the use of Pearson chi squares, we used Fisher's exact tests to compare frequencies. Pearson chi squares revealed that when signs were posted, adults said the name of object significantly more, χ^2 $(1, N = 37) = 5.45$, $p = .02$, and described the object more, χ^2 $(1, N = 37) = 7.54$, $p = .01$, than without signs. There was no difference in adults' pointing to the object by condition: With signs posted, seven adults pointed to the object while only two pointed when signs were not posted (Fisher's exact test; $p = .14$). Two 2-sided Fisher's exact tests found that adults showed the object significantly more to the child ($p = .01$) and asked children more questions ($p = .02$) when signs were posted. Adults also

marginally provided more information about the use of the object (Fisher's exact test; $p = .07$). See Table 1 for mean score and frequencies of each adult behavior included in the total interaction score.

Children's behavior was also altered by the presence of the signs. Pearson chi squares indicated that children pointed to the object significantly more, χ^2 $(1, N = 37) = 4.22$, $p = .04$, and asked more questions about the object, χ^2 $(1, N = 37) = 4.86$, $p = .03$, when signs were posted. However, children did not ask the adult to stop the cart near the object more when signs were posted (Fisher's exact test; $p = 1.0$). See Table 2 for mean score and frequencies of each child behavior included in the total interaction score.

Stores Serving Mid-SES Communities

A combination of Pearson chi squares and Fisher's exact tests revealed no differences in any of the variables that made up the total interaction score of the groups shopping in the mid-SES store ($p > .18$). See Tables 1 and 2 for mean score and frequencies of each variable included in the total interaction score.

DISCUSSION

This study provided preliminary data on a low-cost intervention that could boost linguistic interaction among adults and children. We asked whether placing signage in supermarkets increases conversation among families shopping in a supermarket serving a low-SES population. These engaging, attractive signs asked child-friendly questions that adults were encouraged to use with children. When signs were not present, families shopping in the low-SES store talked significantly less than families shopping in the mid-SES stores, replicating previous findings that low-SES children have fewer and shorter linguistic interactions with their parents (e.g., Hart & Risley, 1995; Rowe, 2008). However, when signs were posted, adults and children were nearly four times more likely to converse in the low-SES store, bringing these groups to the level of adult–child interaction observed in the mid-SES stores. Adult–child interactions when signs were posted contained on average more than 10 conversational turns, and the valence of the adult–child interaction was most frequently positive when signs were posted in the low-SES store. Additionally, adults said the name of the object more, showed and described the object to the child more, and asked the child more questions. Similarly, children pointed to the object more and asked the adult more questions.

For over 20 years, research has documented the lower levels of parent–child interaction in low-SES families (e.g., Hart & Risley, 1995). Our signs appear to encourage lower SES parents to talk with their children. In fact, the interactions

Table 1
Mean Scores and Number and Percent of Groups That Engaged in Each Adult Behavior in Sign Up and Sign Down Conditions in the Low- and Mid-Socioeconomic Status (SES) Stores

		Sign condition	
		Up	*Down*
Points to object			
Low-SES stores	Mean	0.35	0.12
	Number of groups	7	2
	Percent	35.0%	11.8%
Mid-SES stores	Mean	0.35	0.24
	Number of groups	6	4
	Percent	35.3%	23.5%
Shows object to child			
Low-SES stores	Mean	0.35	0
	Number of groups	7	0
	Percent	35.0%	0%
Mid-SES stores	Mean	0.24	0.24
	Number of groups	4	4
	Percent	23.5%	23.5%
Says name of object to child			
Low-SES stores	Mean	0.55	0.18
	Number of groups	11	3
	Percent	55.0%	17.6%
Mid-SES stores	Mean	0.65	0.65
	Number of groups	11	11
	Percent	64.7%	64.7%
Asks child questions about object			
Low-SES stores	Mean	0.30	0
	Number of groups	6	0
	Percent	30.0%	0%
Mid-SES stores			
	Mean	0.41	0.35
	Number of groups	7	6
	Percent	41.2%	35.3%
Describes features of the object			
Low-SES stores	Mean	0.55	0.12
	Number of groups	11	2
	Percent	55.0%	11.8%
Mid-SES stores	Mean	0.29	0.24
	Number of groups	5	4
	Percent	29.4%	23.5%
Provides information about object use			
Low-SES stores	Mean	0.40	0.12
	Number of groups	8	2
	Percent	40.0%	11.8%
Mid-SES stores	Mean	0.35	0.35
	Number of groups	6	6
	Percent	35.3%	35.3%

Note: Thirty-seven groups were observed in the low-SES store: 20 in the Sign Up condition and 17 in the Sign Down condition. Thirty-four groups were observed in the mid-SES stores: 17 in Sign Up and 17 in Sign Down conditions.

Table 2
Mean Scores and Number and Percent of Groups That Engaged in Each Child Behavior in Sign Up and Sign Down Conditions in the Low- and Mid-Socioeconomic Status (SES) Stores

		Sign condition	
		Up	*Down*
Points to object			
Low-SES stores	Mean	0.5	0.18
	Number of groups	10	3
	Percent	50.0%	17.6%
Mid-SES stores	Mean	0.35	0.47
	Number of groups	6	8
	Percent	35.3%	47.1%
Asks adult to stop cart near object			
Low-SES stores	Mean	0.05	0
	Number of groups	1	0
	Percent	5.0%	0%
Mid-SES stores	Mean	0	0
	Number of groups	0	0
	Percent	0%	0%
Asks adult question about object			
Low-SES stores	Mean	0.45	0.12
	Number of groups	9	2
	Percent	45%	11.8%
Mid-SES stores	Mean	0.29	0.41
	Number of groups	5	7
	Percent	29.4%	41.2%

Note: Thirty-seven groups were observed in the low-SES store: 20 in the Sign Up condition and 17 in the Sign Down condition. Thirty-four groups were observed in the mid-SES stores: 17 in Sign Up and 17 in Sign Down conditions.

stimulated by this intervention were exactly in the style of interaction that previous research has shown to encourage language development (e.g., Cristofaro & Tamis-LeMonda, 2011; Hoff, 2006; Tamis-LeMonda et al., 2001). The evidence suggests that early experience with language in the context of social interactions likely facilitates the creation of new neural connections in the language-specific areas of the brain (see Kuhl & Rivera-Gaxiola, 2008 for a review). Thus, children from lower SES households, who tend to experience fewer social interactions with parents (e.g., Hart & Risley, 1995), may derive especially important benefits from this conversation-boosting intervention.

When the same signs were posted in the identical sections of mid-SES supermarkets, we found no significant effect on adult–child interaction. This is likely because the interaction between adults and children was already high in both amount and quality. Mid-SES parents may not require the presence of overt conversation-starters like our signs because they naturally communicate with their children about information in the here and now (e.g., Hart & Risley, 1995; Lawrence & Shipley, 1996).

These preliminary results show that adults and children have richer, more positive interactions when conversation-stimulating signs are present in environments that families naturally visit. Given the increasing number of supermarkets in low-SES areas due to new initiatives, such as the $400 million "Healthy Food Financing Initiative" (U.S. Department of Health and Human Services, 2010), supermarkets may become opportune environments to assist lower SES families in many ways.

One limitation of this study is that we do not know which specific aspects of the manipulation spark increased conversational interaction. Although it is clear from our contrast of Sign Up and Sign Down conditions that the presence of signs likely prompts conversation between adults and children, we cannot fully determine the role that the actual message on the sign plays. Although our comparisons of the two different messages for each target food did not reveal any differences, further research is needed to determine whether an explicit message encouraging the adult to engage the child is necessary or whether the presence of any sign would be equally effective.

Another limitation is that our observers were not blind to condition: it was obvious to see when signs were and were not posted. Moreover, although observers were blind to the hypothesis, it is possible that they could have gathered the purpose of the study from the nature of the observations. Future research should work to further strengthen the observational methodology behind this study, perhaps by including multiple observers for each adult–child group. A third limitation is that we have no information about whether these kinds of conversations continue once families are outside of this immediate environment. It is also not clear how frequently parents need to encounter such signs and in how many different venues for the signage to have significant long-term impact. Future studies should examine the effects of subtle signage in other places adults and children routinely visit such as doctors' offices, public transportation, and the laundromat. If signage were community-wide, perhaps these effects would generalize to other environments, like the home, making these findings pervasive and long-lasting.

Based on behavioral, social, and neurological evidence, it is imperative that we find low-cost ways to support language growth by increasing conversations between caregivers and children in low-income neighborhoods. The current research offers a first step toward a relatively simple and cost-effective intervention that can do precisely that. Because the current intervention is designed for a natural environment that embraces everyday routines in familiar spaces, it offers a scalable way to effect real change for children in these communities. This should encourage a broader discussion of intervention strategies that meet people where they naturally travel, transforming everyday environments into stimulators of cognitive development.

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