Journal of Cross-Cultural Psychology
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Journal of Cross-Cultural Psychology 2009 40: 584 originally published online 14 May 2009
DOI: 10.1177/0022022109335184

The online version of this article can be found at:
http://jcc.sagepub.com/content/40/4/584

Published by:
SAGE
http://www.sagepublications.com

On behalf of:
IACCP
International Association for Cross-Cultural Psychology

Journal of Cross-Cultural Psychology
Volume 40 Number 4
July 2009 584-602

10.1177/0022022109335184
http://jccp.sagepub.com

Culture, Context, or Behavioral Control?

English- and Mandarin-Speaking Mothers' Use of Nouns and Verbs in Joint Book Reading

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Joint book reading provides an ecological context for examining processes involved in the emergence of cultural differences in noun and verb use. Tardif, Gelman, & Xu (1999) found that English- and Mandarin-speaking mothers differed in their relative use of nouns and verbs during joint book reading with their 20-month-olds: Mandarin-speaking mothers produced more main verbs and fewer common nouns than did English-speaking mothers. We sought to clarify the source and specificity of these differences by reexamining these transcripts. Results indicated that cross-linguistic differences in noun and verb use do not arise from cross-cultural variation in behavioral control alone; differences persisted in picture-related conversations. Moreover, in both cultures, mothers' focus on objects and actions shifted in response to the nature of the pictures being discussed. Results are considered in terms of the relationship between culture-specific patterns of book reading, scene perception, and language acquisition.

Keywords: *nouns; verbs; language acquisition; joint book reading; culture*

Imagine a young toddler and his or her parent sitting side by side, flipping through a picture book together. Common to many diverse societies, joint picture book reading is a rich cultural experience. Now picture the same scenario of joint book reading occurring in complete silence. This may pose a challenge because fundamental to the experience of joint book reading is *language.* Over the years, scholars have devoted extensive effort to clarifying the sociocultural significance of joint book reading (Anderson, Anderson, Lynch, & Shapiro, 2003; Fletcher & Reese, 2005; Haden, Reese, & Fivush, 1996; Heath, 1983) as well as its significance for language development (DeTemple & Snow, 2003; Hoff-Ginsberg, 1991; Ninio & Bruner, 1978; Shu, Li, Anderson, Ku, & Xuan, 2002).

Authors' Note: Our thanks go to Susan Gelman and Twila Tardif for sharing the original transcripts now available on the CHILDES database, to Jing Zhao for her assistance with data coding, and to Brian MacWhinney for his guidance in our use of the CLAN software and lexicon. Portions of this work were supported by a Rackham Barbour Scholarship awarded to Cheri Chan, a National Science Foundation Graduate Research Fellowship awarded to Amanda Brandone, and National Science Foundation Grant No. 0350272 awarded to Twila Tardif.

In the present paper, we examine the intersection of these factors by exploring how culture-specific patterns of joint book reading are relevant to culture-specific patterns of children's language development. Specifically, we are interested in the acquisition of common nouns and main verbs. Common nouns and main verbs are central in vocabulary development because together they form the fundamental building blocks that are used to label the people, objects, and actions in the child's world. In our study, we look at how culture-specific patterns of joint book reading as well as the content of the picture book itself influence the ways in which mothers from Mandarin-speaking Chinese and English-speaking U.S. backgrounds focus on the objects, via common nouns, and the actions, via main verbs, in an identical picture book reading context.

Joint Book Reading From a Sociocultural Perspective

The context of joint book reading consists of three fundamental components: a child, an adult, and a book. Varying the properties of these components, such as the child's gender, the adult's socioeconomic status, and the complexity of the book, has been shown to directly influence the a book-reading interaction (Fletcher & Reese, 2005). One area in which researchers have identified qualitative differences across individuals is in the adult's *style* of joint book reading (McNaughton, 1995; Reese, Cox, Harte, & McAnally, 2003). For example, some adults tend to adhere closely to the book and adopt a didactic style of labeling or describing the contents of the pictures. Other adults more actively collaborate with the child on inferring what the pictures mean and making connections with the child's own experiences. Still others focus on asking the children to repeat words and sentences verbatim.

In addition to comparing the effects of different styles of joint book reading on children's language and literacy (Reese & Cox, 1999), researchers have also increasingly emphasized the importance of interpreting and evaluating each style *within its sociocultural context* (Anderson et al., 2003). Joint book reading provides a setting for enculturation: Through guided participation in cultural activities such as joint book reading, children become socialized into the belief systems, interpersonal dynamics, and communicative patterns of their culture (Heath, 1983; Pelligrini & Galda, 2003; Rogoff, 1990).

Recently, an expanding area of cross-cultural research has taken theoretical insights garnered from studies of joint book reading among English speakers and examined their relevance in other languages and cultural systems in countries as varied as China, Finland, Japan, the Netherlands, and Peru (Bus, Leseman, & Keultjes, 2000; Chang, 2000; Melzi & Caspi, 2005; Murase, Dale, Ogura, Yamashita, & Mahieu, 2005; Silven, Ahtola, & Niemi, 2003). For example, in one study, Melzi and Caspi (2005) observed Peruvian and American mothers sharing a wordless picture book with their 3-year-olds. They found that Peruvian mothers preferred a *storytelling* style, characterized by a high degree of information-laden speech containing descriptions and tag questions that were directly related to the pictures in the book. In contrast, American mothers tended to favor a *story-building* style, placing relatively more emphasis on engaging the child with interactive speech and talking about things beyond the pictures in the book. This distinction in style reflects cultural differences both in how the shared narrative is defined as well as in mothers' general assumptions

about how children develop into members of their culture. Hence, the adaptiveness of each book-reading style may be influenced by the degree to which it fits within the expectations and values of a given culture.

When considering picture book reading as a form of shared narrative, a sensitivity to sociocultural values and expectations is crucial not only for interpreting stylistic differences in adults but also for evaluating narrative competence in children. Research has shown that in cultures that emphasize interdependent values, children are often encouraged to produce short and succinct accounts of stories and personal memories. For example, Wang, Leichtman, and Davies (2000) found that unlike English-speaking American mothers, Chinese-speaking mothers create a conversational environment that is repetitive, didactic, and low in elaboration. Meanwhile, children's use of extended narratives and embellished information is discouraged. Similar patterns have been demonstrated in Korean dyads, in which mothers were more likely than U.S. mothers to prevent children from introducing their own topics (Mullen & Yi, 1995), and in Japanese dyads, in which children's contributions were often kept short by their mothers via interruptions (Minami & McCabe, 1995). Although by English-speaking American cultural standards these practices are not considered the most effective in facilitating children's narrative competence, among cultures where children's narratives are expected to contain relatively little detail and elaboration, these practices are perceived to be culturally adaptive. Correspondingly, when evaluating narrative competence in children, it is necessary to first understand the nature of the competence that is being encouraged and reinforced within a specific cultural system.

Joint Book Reading From a Language Development Perspective

In addition to work on the sociocultural significance of joint book reading, a long tradition of research has explored the significance of joint book reading for language development. Studies have shown that joint book reading promotes the use of language that is richer in both quantity and quality than speech occurring in other communicative settings (Hoff-Ginsberg, 1991; Tardif, Gelman, & Xu, 1999). For example, prior studies comparing joint book reading with play contexts have revealed that the former triggered more labeling from caregivers (Ninio & Bruner, 1978) and elicited child language that was greater in amount, intelligibility, and complexity (Davie & Kemp, 2002; Sorsby & Martlew, 1991). Studies have also reported more enduring benefits of joint book reading on children's subsequent literacy levels and vocabulary development (Bus van Ijzedoorn, & Pellegrini, 1995; DeBaryshe, 1993; DeTemple & Snow, 2003; Fletcher & Reese, 2005; Lonigan & Whitehurst, 1998; Senechal, LeFevre, Thomas, & Daley, 1998; Shu et al., 2002; but see DeBaryshe, 1995).

Although a large body of research has demonstrated that joint book reading plays a very important role in promoting language development, few studies have considered this issue from a cross-cultural perspective (but see Ogura, Dale, Yamashita, Murase, & Mahieu, 2006; Silven et al., 2003; Tardif et al., 1999). Given that the experience of joint book reading varies notably across cultures, it remains an open question whether the practice of joint book reading is associated with comparable language gains across cultures. Alternatively, culture-specific patterns of joint book reading may result in language gains that differ qualitatively for children from different cultures.

One area in which joint book reading might result in qualitatively different, culture-specific language gains is vocabulary development. Research has shown that the course of vocabulary acquisition indeed differs across cultures. For example, whereas young learners of English and many other languages tend to acquire early vocabularies dominated by words for people and objects with few action verbs, learners of Mandarin Chinese and Tzeltal have been found to acquire early vocabularies composed of large proportions of action verbs (Brown, 1998; Tardif, 1996). These differences raise the following question: Is the practice of joint book reading in different cultures related to these cultural differences in vocabulary acquisition? More specifically, do culture-specific patterns of joint book reading help bolster relative differences in the proportions of nouns and verbs in English- and Mandarin-speaking children?

A preliminary answer to this question comes from the work of Tardif et al. (1999). In this study, the authors explored the language used by English- and Mandarin-speaking mothers with their 20-month-old toddlers in three play contexts, including a joint picture book reading context. Dyads in both cultures were given 10 minutes to look at an identical picture book containing 43 wordless pictures, with half of the pictures chosen from books in each culture. Dyads were instructed to read the book "as they normally would at home." Tardif and colleagues found that when engaged in joint picture book reading, English- and Mandarin-speaking mothers followed different patterns of language use. English-speaking mothers tended to produce more common nouns and fewer main verbs than did Mandarin-speaking mothers. Interestingly, this pattern of results mirrors the vocabulary composition of English- and Mandarin-learning children: the productive vocabulary of English-learning toddlers tends to include more common nouns and fewer main verbs than that of Mandarin-speaking children (Tardif, 1996).

Joint Book Reading From a Perceptual Perspective

By examining differences in the language that English- and Mandarin-speaking mothers produced about an identical picture book that was equally familiar (or unfamiliar) to mothers and toddlers in both cultures, the work of Tardif et al. (1999) helps us understand whether and how culture-specific patterns of joint book reading are related to differences in the early vocabularies of English- and Mandarin-speaking children. However, the precise aspects of the book reading context that contribute to culture-specific patterns of vocabulary acquisition are not clear. In particular, when looking at a picture book with their children, what parents talk about depends, to an extent, on the way that they themselves perceive the contents of each picture. Parents who diverge in their perceptual preference for different parts of the pictures are likely to also diverge in the language that they use to engage their children in conversation. Cross-cultural studies on scene perception (Chua, Boland, & Nisbett, 2005; Masuda & Nisbett, 2001; Miyamoto, Nisbett, & Masuda, 2006) have reported that when shown an identical set of naturalistic scenes and tested on the attention directed toward different parts of those scenes (measured via eye tracking or a change detection task), adults from cultures that privilege individualistic values, including European American societies, tended to focus on the focal agent or object in the scenes, but adults from cultures that emphasize collectivistic values, such as Chinese societies, paid more attention to the relations and context in which the focal elements were embedded. In

Tardif et al.'s (1999) picture book task, U.S. and Chinese mothers had to pay attention to the scene presented by each picture in order to guide their children to attend to and talk about specific aspects of the scene. An interesting question is whether the cross-cultural differences found in studies of adult scene perception are manifested in U.S. and Chinese mothers' child-directed speech for pictures that were simpler, and specifically, across different types of pictures in the naturalistic context of joint book reading. Because concepts of objects and relations tend to be articulated using common nouns and main verbs, respectively, the relative proportion of common nouns and main verbs that parents include in their speech can serve as a proxy to the perceptual preferences with which they approach the pictures.

The Current Study

In the current paper, we reexamine the transcripts from Tardif et al. (1999) in light of two important issues. First, in terms of methodology, in Tardif et al.'s (1999) analyses, all the speech produced during the book-reading session was included, regardless of whether individual utterances were relevant to the joint book reading experience itself. That is, analyses included off-task utterances (e.g., "Are you tired?") as well as utterances that were task relevant but not picture relevant (e.g., "Turn the page"). With this in mind, it is not clear whether the differences found previously arose because of cultural differences in joint book reading or simply because of variations in the amount of behavioral control exerted by the caregivers. For example, one possibility is that the greater proportion of main verbs produced by Mandarin-speaking mothers may have resulted from Chinese mothers' use of more verbal directives (e.g., "Sit down"; "Turn the page") to manage their children's behavior. This pattern of results may be expected because it is culturally normative for Chinese caregivers to adopt a style of parenting likely to be seen as "authoritarian" in Western cultures (Chao, 1994). An authoritarian parenting style is characterized as one that involves the parent being highly directive with set standards of conduct, along with expectations of obedience from the child (Baumrind, 1967). Thus, to determine whether previous findings reflected actual cross-cultural variation in speech related to the picture book or whether they were because of differences in behavioral control, the present analysis included only maternal speech that was prompted directly by specific pictures in the book: We excluded all utterances that functioned to control the child's behavior (e.g., "Sit down!"), or were spontaneous comments on topics unrelated to the pictures (e.g., "She [the experimenter] will be back very soon").

Our second goal in reexamining the transcripts of Tardif et al. (1999) was to investigate the specificity of the observed cross-cultural differences. In the original analyses, Tardif et al. (1999) reported *overall* differences in common noun and main verb use across cultures. That is, they examined the number of unique common nouns and unique main verbs produced by each mother across the entire book-reading context. However, considering that all participants were examining an identical book containing 43 distinct pictures, it was also worth exploring whether the observed cross-cultural differences in common noun and main verb use can be pinpointed more precisely to particular pictures or to particular types of pictures. To address whether culture-specific patterns of common noun and main verb use varied by picture type, we collapsed the pictures in the book into three specific categories:

pictures of agents (animals), pictures of objects, and pictures of transitive actions. The choice of these three categories was motivated by their correspondence to the linguistic categories of nouns and verbs—the very types of words that make up English- and Mandarin-learning children's earliest vocabularies. In particular, pictures of agents and pictures of objects were analyzed separately because, despite their mutual correspondence to nouns, they diverge conceptually such that objects are primarily acted on, whereas agents can also perform intentional actions. This bears on the types of words that the pictures elicit. In addition, agent words and object words themselves follow different trajectories in vocabulary growth, with agent words predominating in English and Mandarin learners' earliest vocabularies before giving way to object and action words (Tardif et al., 2008). We compared across the three picture categories to explore whether different types of pictures elicited different patterns of common noun and main verb use, and, if so, whether those patterns were consistent or varied across the two cultures.

We expected pictures of objects to trigger sequences of ostensive labeling and thus elicit the largest ratio of nouns to verbs across cultures. Moreover, we expected this pattern to be stronger for English-speaking mothers because of the prominence of ostensive labeling in English adult-to-child speech (Goldfield, 2000; Ninio & Bruner, 1978). Our predictions for the other types of pictures were more tentative. Pictures of transitive scenes might elicit the lowest ratio of nouns to verbs in both cultures; the salient action in the foreground might invite more verb-focused talk. Moreover, Mandarin speakers might show an even greater focus on the context and relations in the picture and thus produce more verbs than English speakers. On the other hand, it is equally possible that, under such controlled contexts of use, the language differences could disappear and only picture-type differences would show up. Alternatively, given the simplicity of the pictures, it could also be that linguistic differences overwhelm any types of differences in word use across the different picture types. Finally, neither of these effects might appear given that behavioral control speech is removed from the analysis in the present study.

Because previous research can only alert us to these various possibilities, the present study set out to ask (a) Do culture-specific patterns of common noun and main verb use remain when behavioral control utterances are excluded from the book-reading session? (b) Are these culture-specific patterns pervasive or specific to particular types of scenes displayed in the pictures?

Method

Participants

Forty-nine mothers and their 20-month-old toddlers participated in a study conducted by Tardif et al. (1999), which compared language use across English- and Mandarin-speaking dyads in three dynamic contexts. The sample included 25 English-speaking children (11 boys, 14 girls) and their mothers who were recruited from the subject pool in a Midwestern university town in the United States. Their mean age was 20 months, 20 days (*SD* = 1 month, 1 day). Twenty-four Mandarin-speaking children (12 boys, 12 girls) were recruited from hospital immunization records and word of mouth in the university area of Beijing, China. Their mean age was 20 months, 5 days (*SD* = 1 month, 5 days), which did not

differ from that of the English-speaking children. In terms of educational attainment, English-speaking mothers and fathers received an average of almost 6 years of postsecondary schooling, whereas Mandarin-speaking parents received an average of 3.5 years of postsecondary schooling.[1] Although information on home reading practices was not collected from individual participants, researchers examining parental attitudes and behavior related to home literacy environment have shown shared book reading to be a familiar and valued activity in both U.S. and Beijing homes (e.g., Fletcher & Reese, 2005; Li & Rao, 2000).

Materials

A picture book was created specifically for the Tardif et al. (1999) study using pictures from books that were readily available in either the United States or China, with roughly half of the pictures from each culture. After consulting with a small group of parents in each culture, 43 pictures of common scenes, animals, vehicles, and objects were selected (see Appendix A for a list). The items were chosen for their simplicity and familiarity in both cultures, with the primary constraint being that none of the pictures could contain any written letters, words, or characters. The pictures were scanned into the computer and modified so that they would fit on pages of equal size. They were then randomly ordered, laminated, and collated to form a book.

Procedure

The entire experimental session conducted by Tardif et al. (1999) consisted of three 10-minute interactive play sessions: picture book reading, playing with regular toys, and playing with mechanical toys. Only the picture book reading session is considered in the present study. In this session, an experimenter brought a picture book into the play room, and asked the mothers to look at the book with their child "as they normally would at home." To familiarize participants with all the pictures, the experimenter flipped through the various pages of the book from beginning to end. The experimenter said only, "Oh! Here's one!" ("*wa! zher4 you3 yi2-ge!*"), "Here's another one!" ("*zher4 hai2 you3 yi2-ge*"), as she turned the pages of the book. The experimenter's comments were restricted so as not to bias the mothers with any particular noun or verb labels for the objects. Once the experimenter had flipped through the entire book, she then left the room so that the mothers and children could explore the book on their own.

Transcribing Naturalistic Speech and Data Reduction

All sessions were audio taped and transcribed into CHAT format (MacWhinney, 1991; MacWhinney, B., 2000) by native speakers of each language. Because a very limited amount of intelligible speech was produced by the 20-month-olds during the session, the present analyses focused only on the mothers' utterances.

Next, we proceeded to extract utterances relevant to our set of research questions. As described previously, the first goal was to investigate the extent to which the findings reported by Tardif et al. (1999) could be explained by cross-cultural variations in behavioral control and to see whether any differences remained once these utterances were removed. The second goal of the analysis was to describe the way in which mothers' use of common

nouns and main verbs during shared book reading was influenced by the nature of the depicted scene.

To address these goals, we first extracted all the picture-relevant utterances produced by each mother. Decision trees were developed to allow trained coders to annotate the English and Mandarin transcripts in a standard format that specified the precise utterance at which each segment of picture-related conversation began and ended. To assess intercoder reliability, two native speakers blind to the goals of the study coded four English and four Mandarin transcripts. The Cohen's kappa coefficients for English and Mandarin were .82 and .91, respectively.

Next, we used the linguistic analysis software CLAN (MacWhinney, 2000) to extract every annotated segment of conversation from the English and Mandarin transcripts. Each extracted segment was categorized according to the specific picture (out of the 43 in the book) that prompted the conversation. To address our question concerning the influence of picture type on maternal speech, we further divided the 43 pictures into three types:[2] scenes depicting a transitive action (transitive scenes; $n = 3$), such as a girl petting a cat; scenes depicting an animate living thing (agent scenes; $n = 12$), such as a lion; and scenes depicting an isolated object (object scenes; $n = 25$), such as a pair of shoes. Three of the pictures (doll, teddy bear, and a boy standing astride) could not be categorized unambiguously and exclusively into one type of scene and, thus, were not included in the analyses.

For the remaining conversation segments, we coded each word according to its grammatical class. In the present analysis, we focused on the variety of common nouns and main verbs produced by mothers across cultures. Common nouns included references to objects, animals, and people. Because we were interested in labels for perceptible animate and inanimate objects typical of early acquired nouns, abstract nouns (e.g., music, time) were not included in the common noun category. Pronouns and proper names (including terms referring to members of the child's family, such as *Mommy* and *Daddy*, and terms referring to the child, such as *Honey* and *Sweetie*) were also excluded from the analysis because they are syntactically and pragmatically marked in ways distinct from those corresponding to common nouns (Bloom, 1990; Jaswal & Markman, 2001). Main verbs included general purpose actions (e.g., do), specific actions (e.g., jump), acts of communication (e.g., whisper), acts of perception (e.g., listen), and postures (e.g., sit). Because our focus was on labels for perceptible actions typical of early acquired verbs, auxiliaries (e.g., "is" in "is going," "can" in "can do"), verb complements (e.g., "*gu04*" and "*lai2*" in "*zou3 gu04 lai2*") and mental state verbs (e.g., think, know) were not included in the main verb category.

Although Tardif et al. (1999) found differences in both the number of "types" (i.e., frequency of different words, ignoring repetitions) and "tokens" (i.e., total frequency including repetitions), our analyses focus only on word types. Finding a difference in word types is a far more conservative measure (Richards, 1994; Tardif, 1996) than simply counting total frequencies and is arguably more relevant to our questions of interest—determining whether observed styles of English- and Mandarin-speaking mothers hold up after excluding behavioral control language, and whether the particular pictures being talked about influence the types of words produced.

Results

Upon excluding behavioral control speech and focusing on the utterances prompted directly by the pictures, we found that Mandarin-speaking mothers produced significantly more word types ($M = 147.75$; $SD = 36.21$) during the 10-minute book reading session than did English-speaking mothers ($M = 107.04$; $SD = 32.86$), $F(1, 47) = 17.01$, $p < .01$. A similar pattern was observed with the total number of word tokens (English $M = 375.24$, $SD = 141.79$; $M = 662.38$, $SD = 208.27$), $F(1, 47) = 32.06$, $p < .01$. Thus, in terms of both variety and quantity of words, Mandarin-speaking mothers produced more picture-relevant speech than did English-speaking mothers. Nevertheless, when comparing the two groups in terms of mean length of utterance, we found that English-speaking mothers produced utterances of greater complexity ($M = 4.02$; $SD = 0.52$) than did Mandarin-speaking mothers ($M = 3.58$; $SD = 0.37$), $t(47) = 3.36$, $p < .01$. There were no effects of child gender on the variety (word types), quantity (word tokens), or complexity (mean length of utterance) of maternal speech.

To avoid confounds due to cross-cultural differences in the total number of words produced as well as differences in the number of pictures composing each picture type, all subsequent analyses will consider *proportions* of common noun types and main verb types out of the total number of word types produced. To determine the proportions, we first calculated the total number of common noun types, main verb types, and total types produced for each picture. Then we calculated the proportions of noun and verb types out of total types for each picture. Finally, for each scene type we calculated the mean proportions of common noun and main verb types by averaging the proportions of noun and verb types across pictures of each scene type.

To examine the influence of culture and scene type on noun and verb use, the average proportions of common noun and main verb types out of the total number of word types prompted by pictures of transitive actions, pictures of agents, and pictures of objects were entered into a repeated-measures multivariate analysis of variance with Word Type (proportion of common noun types, proportion of main verb types) as the dependent variable, Scene Type (transitive, agents only, objects only) as the repeated measures independent variable, and Language (English, Mandarin) as the between-subjects variable. Because preliminary analyses of our data indicated that child gender had no effect on maternal language use, child gender was excluded from further analysis.

The first question of interest was whether English- and Mandarin-speaking mothers still differed in their common noun and main verb production when considering only picture-relevant talk. Results revealed a significant interaction between word type and language, $F(1, 44) = 9.40$, $p < .01$. Specifically, English-speaking mothers produced significantly more common noun types ($M = 0.19$; $SD = 0.01$) than main verb types ($M = 0.17$; $SD = 0.01$), $F(1, 44) = 4.76$, $p < .05$, whereas Mandarin-speaking mothers produced significantly more main verb types ($M = 0.18$; $SD = 0.01$) than common noun types ($M = 0.15$; $SD = 0.01$), $F(1, 44) = 4.64$, $p < .05$. In addition, English-speaking mothers produced significantly more common noun types than did Mandarin-speaking mothers, $F(1, 44) = 11.70$, $p < .01$. Hence, differences in common noun and main verb production both across and within languages remained even after excluding behavioral control talk.

The second question of interest was whether cross-linguistic differences in common noun and main verb production were pervasive or specific to particular kinds of scenes. Results revealed a significant interaction between word type and scene type, $F(2, 88) = 10.70$, $p < .01$. That is, scene type influenced both English- and Mandarin-speaking mothers' use of common nouns and main verbs. Across cultures, mothers produced significantly more main verb types than common noun types when talking about transitive scenes, $F(1, 44) = 11.70$, $p < .01$, marginally more common noun types than main verb types when talking about object scenes, $F(1, 44) = 3.20$, $p < .10$, and comparable levels of common noun types and main verb types when talking about agent scenes, $F(1, 44) = 1.54$, $p < .30$.

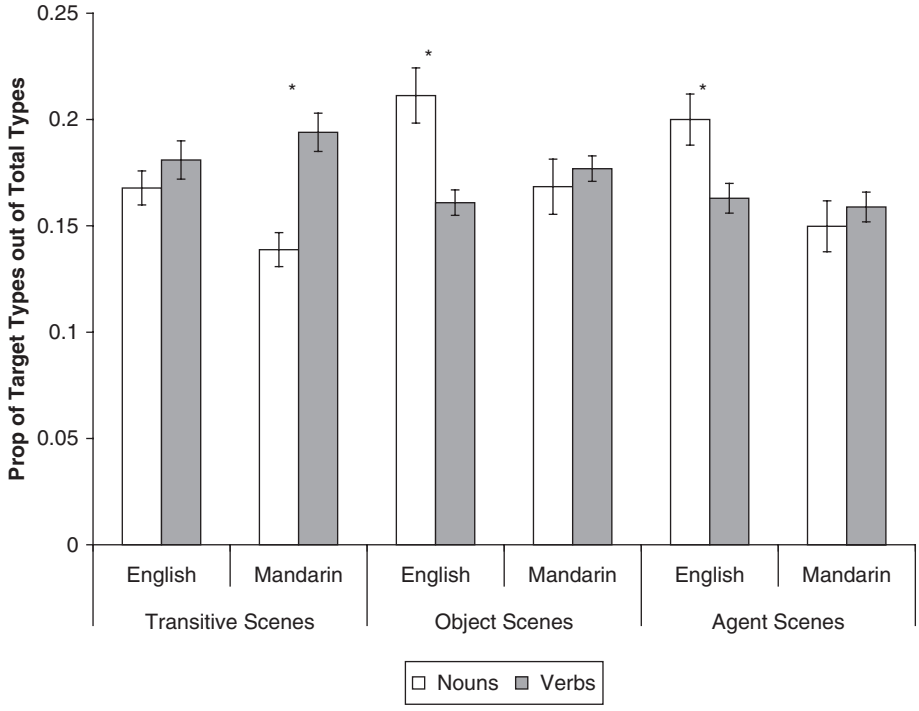
Moreover, although the three-way interaction between language, word type, and scene type was not significant, $F(2, 88) = 0.24$, $p = .79$, planned comparisons were conducted to examine cross-cultural differences in common noun and main verb use within each scene type. Results revealed varying patterns (see Figure 1). When talking about transitive scenes, English- and Mandarin-speaking mothers focused on common nouns and main verbs in contrasting ways, $F(1, 44) = 4.42$, $p < .05$: English-speaking mothers produced equal proportions of common nouns and main verb, $F(1, 44) = 0.87$, $p = .36$, whereas Mandarin-speaking mothers used relatively more main verbs than common nouns, $F(1, 44) = 15.23$, $p < .01$. When talking about object scenes, English- and Mandarin-speaking mothers also focused on common nouns and main verbs in unique ways, $F(1, 47) = 6.79$, $p < .05$: English-speaking mothers produced significantly more common nouns than main verbs, $F(1, 44) = 9.26$, $p < .01$, whereas Mandarin-speaking mothers produced comparable proportions of common nouns and main verbs, $F(1, 44) = 0.26$, $p = .61$. Finally, when talking about scenes depicting agents, the interaction between word type and language was marginally significant, $F(1, 47) = 2.73$, $p < .15$: English-speaking mothers produced significantly more common nouns than main verbs, $F(1, 44) = 5.48$, $p < .05$, whereas Mandarin-speaking mothers used comparable proportions of common nouns and main verbs, $F(1, 44) = 0.35$, $p = .56$.

Discussion

The present study examined English-speaking U.S. and Mandarin-speaking Chinese mothers' attention to objects and actions (via the use of common nouns and main verbs) in the context of shared picture book reading with their 20-month-old children. We sought to clarify the source of the cross-cultural patterns found previously by Tardif et al. (1999)—that U.S. mothers tended to produce more common nouns and fewer main verbs than Chinese mothers. We asked whether these differences were due to mothers emphasizing different aspects of the pictures in speech related directly to the book or whether they instead reflected variation in mothers' behavioral control speech. Results revealed that even after behavioral control talk was excluded, significant contrasts remained in how English- and Mandarin-speaking mothers focused on common nouns versus main verbs.

In addition, the present study explored the specificity of the cross-cultural differences in common noun and main verb use by looking at whether the differences were pervasive across various types of pictures, or whether they could be attributed to particular types of pictures. The analysis revealed a pattern that demonstrates both *differences*—in the ways

Figure 1
Proportion of Noun Types and Verb Types Produced by English- and Mandarin-Speaking Mothers in Conversations About Transitive Scenes (n = 3), Object Scenes (n = 25), and Agent Scenes (n = 12)



*$p < .05$.

in which mothers focused on common nouns versus main verbs— and *similarities*—in how the focus on common nouns versus main verbs was moderated by the type of picture being talked about—across the U.S. and Chinese dyads.

Our analyses revealed that the relative differences in the ways in which English- versus Mandarin-speaking mothers used common nouns and main verbs was sustained across scenes of transitive action, isolated objects, and, to a lesser extent, isolated agents. Although participants looked at identical pictures in a controlled context of shared book reading, English-speaking mothers nonetheless used more common nouns and fewer main verbs than did Mandarin-speaking mothers. Moreover, this pattern was accentuated in conversations about transitive actions (where Mandarin speakers showed a strong preference for using main verbs) and isolated objects (where English speakers showed a strong preference for using common nouns).

One way to make sense of the above findings is by placing them in the context of a body of cross-cultural research reporting cultural differences in patterns of scene perception (Chua et al., 2005; Masuda & Nisbett, 2001; Miyamoto et al., 2006). These studies have

shown that when presented with complex scenes, participants from individualistic cultures, including European American societies, paid greater attention to and recalled with higher accuracy the focal object or agent, whereas participants belonging to cultures that privileged collectivistic values, including Chinese societies, tended to show attention and memory preferences for relations and the context in which the focal elements were embedded. Extrapolating from these studies to the current data, it may be that when looking at and talking about scenes of transitive actions (e.g., a girl petting a cat), U.S. mothers emphasized the focal agents and objects in the foreground (e.g., the girl, the cat, and their features), whereas Chinese mothers focused on the actions and relations that connected those focal elements (e.g., how the girl and the cat were related through the action of petting, the nurturing role of the girl, and the dependent role of the cat).

Similar cross-cultural differences may be demonstrated when mothers and their children talk about object scenes. Consider the excerpts of conversation sampled from an English-speaking dyad and a Mandarin-speaking dyad talking about an identical picture of a dandelion, presented in Appendix B. These examples illustrate the overall trends observed such that when English-speaking dyads were talking about an object, they tended to place greater emphasis on identifying and describing the salient focal object, via labeling the object, and pointing out defining features (e.g., flowers, leaves) that themselves afforded noun labels. This pattern of behavior echoes prior findings reported by Goldfield (2000) showing that English-speaking mothers typically elicit and reinforce children's production of nouns, whereas they use verbs more often for prompting their children to produce an action. In contrast, when talking about the identical object scene, Mandarin-speaking dyads tended not to go into detail about the features of the object. Instead, attention was placed on the actions and events with which the object could be associated (e.g., smelling the flower), leading to a higher proportion of verbs relative to the English speakers.

Although intriguing, perceptual explanations (e.g., Masuda & Nisbett, 2001) for the present findings assume a transparent link between the way mothers attended to various aspects of the pictures and the way they subsequently talked about these pictures with their toddlers. The current data do not allow us to confirm this link. Thus, to more effectively address how English- and Mandarin-speaking mothers talk about pictures, it is necessary also to look for clues within the nature of the two languages.

One possibility that features frequently in traditional accounts relates to typological contrasts existing between English and Mandarin (see Li & Thompson, 1989). For instance, because the grammar of Mandarin allows both the subjects and the objects of a sentence to be dropped and because the complexity of inflectional markings is simpler in Mandarin verbs, the salience of verbs relative to nouns tends to be higher in Mandarin than it is in English (see Tardif, Shatz, & Naigles, 1997). Although these typological differences may play a role in the favoring of main verbs in spoken Mandarin, analyses of maternal input in languages possessing similar features (e.g., Italian, Japanese) seem to suggest that it is unlikely for typological properties to be the only influence (Ogura et al., 2006; Tardif et al., 1997).

An alternative proposal has drawn attention to cross-linguistic differences in the habits of lexicalization specific to English and Mandarin (Tardif, 2006). Specifically, English speakers tend to use more general-purpose verbs (e.g., *carry*, *take*) and specific nouns (e.g., *train*, *bike*) in their everyday conversations. In contrast, Mandarin speakers lexicalize action concepts using many distinct and specific verbs and use general-purpose nouns. For

example, in Mandarin, even when addressing young children, distinct verbs are used to express the act of carrying on one's back (*bei4*), in one's arms (*ba04*), flat with two hands (*duan2*), and dangling with one hand (*ling1*). In English, however, the general-purpose verb *carry* is used to express all these action concepts. Moreover, in Mandarin, many nouns of everyday use are general purpose. For example, *train* (*hu03che1*), *bike* (*zi4xing2che1*), and *truck* (*ka3che1*) are frequently referred to by using their shared noun root *vehicle* (*che1*). To the extent that child-directed speech also reflects such conventions of everyday conversation, the tendency of using a greater variety of specific verbs and a smaller set of general-purpose nouns in Mandarin would increase the relative ratio of main verb to common noun types in a given naturalistic sample. These differences in habits of lexicalization offer an additional linguistic account for why Mandarin speakers in our study used more main verb and fewer common noun types than did English speakers.

In addition to the divergence of English- and Mandarin-speaking mothers in their relative use of common nouns versus main verbs, striking *convergence* across cultures was observed in the way this noun–verb balance was moderated by the three types of scenes. In particular, transitive scenes elicited the lowest ratio of common nouns to main verbs, object scenes elicited the highest ratio, and agent scenes elicited a pattern that was intermediate between the two. These findings indicate that, despite baseline cross-cultural differences in common noun and main verb use, English- and Mandarin-speaking mothers make comparable adjustments to their language in relation to the type of scene prompting the conversation. Such trends echo previous patterns found in Tardif et al. (1999) showing how *activity contexts* of toy play and book reading moderated the balance of common nouns and main verbs that appeared in speech. Specifically, the authors found that mechanical toys and, to a lesser extent, regular toys elicited conversation with many more main verbs than common nouns. Meanwhile, picture book reading elicited conversation with more common nouns than main verbs. Together, these findings suggest that, in both cultures, when mothers and children jointly attend to and talk about things that are more interactive (e.g., mechanical toys, pictures of transitive actions), their speech reflects the dynamic nature of the material by containing more main verbs. Moreover, this pattern is sustained even in the face of baseline cross-cultural differences in common noun and main verb production.

In sum, English- and Mandarin-speaking mothers' common noun and main verb use during shared picture book reading is best explained by the combined effects of (a) cultural preferences in speech and perception, (b) language properties including the conventions of use, and (c) the type of scene presented in the picture. Together, these factors culminate in a cross-cultural comparison in which both differences and similarities prevail.

The prevalence of both differences and similarities observed in the current study and many others challenges our thinking about cross-cultural research on several levels. First, in the specific area of word learning, research based on English-speaking populations has traditionally shown that nouns are acquired before verbs (Bates et al., 1994; Nelson, Hampson, & Kessler Shaw, 1993) with corroborating evidence from monolingual infants learning Spanish, Italian, Japanese, Hebrew, and other languages (Bornstein et al., 2004; Gentner, 1982; Ogura et al., 2006). Supporting theories attribute the apparent ease of noun learning to the fact that noun referents are commonly more salient, concrete, and easily individuated than are verb referents (Gentner, 1982; Gentner & Boroditsky, 2001). Recently, however, the story has been complicated by cross-cultural studies showing that

young learners of Mandarin, Korean, and Tzeltal have early vocabularies composed of as many verbs as nouns (Brown, 1998; Choi & Gopnik, 1995; Kim, McGregor, & Thompson, 2000; Tardif, 1996). To explain these differences, an increasing number of cross-cultural studies have examined various factors, including the nature of caregiver speech (Choi, 2000; Ogura et al., 2006; Tardiff et al., 1999, Tardiff et al., 1997). However, because the goal of these studies was generally to document and verify the differences across cultures, less attention has been paid to the ways in which cultures are similar. In the current study, English and Mandarin speakers differed consistently in their use of common nouns and main verbs, but they also converged in the ways in which they responded to the dynamic nature of the pictures. Thus, accounts of cross-linguistic differences must be fine-tuned to accommodate the fact that both cultures respond to different types of pictures and contexts by shifting their noun–verb use in similar manners.

On a second and broader level, this study also illustrates the changing role of cross-cultural research in the field. Cross-cultural research is no longer simply a compare-and-contrast exercise to highlight limitations of the traditional practice of developing theories based predominantly on observations of the Caucasian middle class (Heine & Norenzayan, 2006; Matsumoto & Yoo, 2006). Nor is its purpose to reinforce the use of dichotomous constructs to account for the points on which cultures diverge. Instead, cross-cultural data are increasingly used to inform the understanding of *process.* Our study does this by illustrating how cross-cultural differences in mothers' focus on nouns and verbs are due to both the properties of the languages themselves and subtle differences in the ways in which mothers selectively accentuate opportunities and affordances in their environments.

Third, these data challenge us to consider cross-cultural differences in language use in the adaptation of both language measurement instruments such as the Peabody Picture Vocabulary Test (Dunn, 1965), and language intervention procedures such as dialogic reading (Whitehurst et al., 1988) for Chinese-speaking populations. The primary focus in instruments designed for English learners has been on the development of noun vocabularies; however, our data suggest that—at least for Chinese speakers—equal emphasis ought to be paid to action concepts and the development of verb vocabularies. Considerations of cultural and linguistic factors in other languages should also be taken into account when adapting these types of instruments for other cultural and linguistic groups.

Finally, this study adds to the literature on the ways in which culture-specific patterns of joint book reading, as an early developmental experience common to many communities (e.g., Li & Rao, 2000), might be related to culture-specific patterns of language acquisition. Although traditional accounts have portrayed book reading as a uniquely noun-friendly context that invites frequent, explicit object labels (e.g., "This is a frog"; Choi, 2000; Goldfield, 1993), the present data indicate that cultural preferences influence the degree to which nouns are emphasized, even in this context. Moreover, this influence derives not only from the macrostructure of the context but also from its internal details. Specifically, during book reading, the more dynamic the content contained in the pictures, the greater the tendency for both groups of mothers to use verbs with their children. In conclusion, context, at multiple levels, plays a pivotal force in shaping the focus that parents place on objects (via common nouns) versus actions and relations (via main verbs) during conversations with their young children.

Appendix A
List of Pictures in Picture Book by Type

Picture Type	Items
Transitive scenes (n = 3)	Boy listening to his wristwatch; girl petting a cat; boy playing in a sandbox
Agent scenes (n = 12)	Lion; butterfly; dinosaur; turtle; duck; mouse; frog; bird; dog; gorilla; cow; beetles
Object scenes (n = 25)	Soccer ball; saucepan; bulldozer; shoes; telephone, saw, clown hat; carrot; violin; dandelions; comb; car; umbrella; apple; kite; hat and mitten; hammer; coat; tree; teapot; chair; mushrooms; airplane; motorcycle; pencil; sailboat; tractor

Appendix B

Excerpts of conversation sampled from an English-speaking dyad and a Mandarin-speaking dyad talking about an identical picture of a dandelion.

Common nouns are denoted by a double underscore, and main verbs are denoted by a single underscore. PN = proper name; NEG = negative marker; SVC = serial verb complement; CL = classifier; SFP = sentence final particle

English-speaking dyad

Mother:	There's that dandelion.
Child:	Dandelion.
Mother:	Dandelion.
Mother:	Look it has the yellow flowers.
Mother:	And the green leaves.
Child:	Green.
Mother:	Green leaves.

Mandarin-speaking dyad

Mother:	zhe4	shi4	hua1-hua1	
	this	is	flower- (reduplicated)	
	(This is a flower.)			
Child:	yi1yi1	ya04	na2	hua1-hua1.
	PN	want	get	flower- (reduplicated)
	([Child's name] wants to get the flower.)			
Mother:	yi1yi1	ya04	na2	hua1hua1.
	PN	want	get	flower- (reduplicated)
	([Child's name] wants to get the flower.)			
Mother:	zhe4	shi4 . . .		
	this	is		
	(This is . . .)			

(continued)

Appendix B (continued)

Mother:	na2	bu2	xia4	lai2.	
	get	NEG	SVC	SVC	
	([You] can't get it off.)				
Mother:	da04	wai4mian4	cai3	ye3	hua1
	go	outside	pick	wild	flower
	([We have to] go outside to pick wild flowers.)				
Mother:	ni3	zhe4	ge4	shi4	hua4pian1
	you	this	CL	is	picture
	(The one you have is a picture [of a flower].)				
Mother:	hua4	de			
	draw	SFP			
	([Someone] drew it.)				

Notes

1. In consideration of prior studies on English-speaking families that had suggested a relationship between socioeconomic status and the nature of home literacy experience (e.g., Heath, 1983; Hoff-Ginsberg, 1991, 2003), we made our best attempt to match the U.S. and Chinese mothers on this regard. Parental education is one of the traditional indicators of socioeconomic status. In this study, although the U.S. and Chinese participants differed in their absolute number of years of education, they represented similar social strata, with both groups being well above the average in education for their respective societies (see Population Census Office, 1993; U.S. Bureau of the Census, 1994). To investigate the potential influence of socioeconomic status on the nature of mothers' speech in the present study, we performed correlations within each cultural group between the level of parental education and the proportions of nouns and verbs that mothers used during book reading. No significant correlations were found for either sample.

2. It is important to note that because the Tardif et al. (1999) study was not designed to address the issue of scene type, the number of pictures composing the three types of scenes was unequal. To deal with this issue, as discussed in the results section, our analyses consider the proportions of common noun and main verb types out of the total number of types produced for each picture. Although the uneven number of pictures could affect the mean *numbers* of noun and verb types produced for each scene or scene type, there is no reason to believe that it would affect the mean *proportions* of noun and verb types within each scene, or when averaged across scenes within a scene type.

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