A study on Turkish motherese in the context of toy play*

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Abstract
Parent-child interactions and characteristics of mothers’ child-directed language have been related to children’s linguistic development. Studies on parent-child interactions in Turkey have generally focused on children. There have not been many researches on Turkish motherese. This study addresses this gap by exploring the properties of Turkish maternal language input within the framework of Bloom’s Taxonomy of Cognitive Domain (1956). Bloom identified six levels in a hierarchical framework, from simple to more complex. Since children are expected to think at the higher levels of this taxonomy when they enter school, it is important to be introduced with the higher levels during the preschool years. Turkish mothers differing in socioeconomic status (SES) and their preschool children were taped in their homes in the context of toy play. To this end, this study tries to explore what, if any, differences are found between high SES and low SES mothers’ utterances in terms of the levels of the Cognitive Domain. The results showed that high SES mothers produced more utterances at higher levels, thus, high SES children were encouraged more by their mothers to think at higher cognitive levels before they start formal schooling.

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Keywords: Motherese, language input, Bloom’s Taxonomy of Cognitive Domain, child-directed speech; mother-child interaction

1. Introduction
Linguistic development starts at home. Family socioeconomic status (SES) plays a very important role in children’s linguistic development (Hoff, 2003). According to Hoff et al. (2002), mothers’ talk to children differs as a function of SES; higher SES mothers show more of the characteristics of maternal speech that are positively associated with language development than lower SES mothers. Studies have shown that interactions between mothers and their young children are predictive of positive child cognitive and language outcomes (Tamis-LeMonda et al., 2004; Duursma, Pan & Raikes, 2008; Pancsofar & Vernon-Feagans, 2006; 2010).

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The quality of mother-child interaction has been identified as an important element associated with child development. Studies show maternal language input has a positive effect on child outcomes. This cross-sectional study focuses on the link between mothers’ SES and language input during preschool period. While previous studies on parent-child interaction investigated language input in contexts like book-reading, picture reading, meal time and dressing (Hoff-Ginsberg, 1991; Bus, van Ijzendoorn & Pellegrini, 1995; Reese & Cox, 1999; Ekmeckçi & Keşli, 2001; Zevenbergen & Whitehurst, 2003; Küntay & Slobin, 1995, 1996, 2001, 2002; Küntay & Ahtam, 2004; Türkay, 2007; Cengiz, 2010; 2013; Cengiz & Çakır, 2012, 2015), the present study extends the line of research on mother-child interaction by analyzing the properties of maternal language use in the interaction between mothers and their 5-year-old children in toy play context in terms of Bloom’s Taxonomy of Cognitive Domain. The aim of this research is to determine the cognitive levels of Turkish mothers’ language use and how their SES affects the level of their utterances. There has been almost no research on Turkish mothers’ language input in the context of toy play in accordance with Bloom’s Taxonomy of Cognitive Domain. There is a need to examine mothers’ level of participation and their contribution with respect to children’s language and literacy development. The present study addresses this gap and tries to reveal the properties of Turkish motherese within the framework of Bloom’s Taxonomy of Cognitive Domain. Literature review

1.1. Theoretical background

In the 1950s, a group of educational psychologists at Harvard University headed by Benjamin Bloom developed a classification of educational goals and objectives to create a framework for organizing the various learning activities and this became a taxonomy of educational objectives (Zywno, 2003: 60). It was published in 1956 and it is still widely used in educational research (Davidson & Baldwin, 2005). Bloom’s Taxonomy of Cognitive Domain (1956), often represented as a pyramid, consists of a hierarchy of six levels of thinking starting with lower-order thinking at the bottom and ending with higher-order thinking at the top (Ellison, 2010: 25). In other words, Bloom identified six levels of thinking representing increasing levels of cognitive complexity. Each level is presumed to encompass those below it.

During the 1990s, a new group of cognitive psychologists led by Anderson, a student of Bloom’s, updated the taxonomy and the revision was published in 2001 including some changes in terminology which can be seen together with the old version in Figure 1 below:

Figure 1. Bloom’s Taxonomy of Cognitive Domain (Anderson & Krathwohl et al., 2001).

The main difference between the two versions is that six major categories were transformed into verbs and some were renamed. Another difference is that synthesis and evaluation levels in the
original version have been repositioned as evaluate and create. Therefore, the levels of the revised taxonomy turned into remember, understand, apply, analyze, evaluate, create. The revised taxonomy is presented below in Figure 2 with some sample behaviors for each level.

Figure 2. Bloom’s Revised Taxonomy (www.cpahslibrary.org/blooms-taxonomy.html)

Bloom’s Taxonomy built on earlier research by Vygotsky (1978), who proposed that social interaction, and particularly the language during social interaction, is critical for children’s cognitive development. Vygotsky (1978: 89) believed that language developed by the communication between the child and the people around her/him. He also pointed out the influence of play on child’s development. According to Vygotsky (1978: 99), while playing a child instinctively separates meaning from an object without knowing s/he is doing it, just like s/he speaks without paying attention to the words. In this way, words become parts of the play and by means of play, the child gains functional definitions of concepts.

1.2. Research questions

This study tries to add to the current literature on child-directed speech by examining mother-child interactions during toy play in terms of Bloom’s Taxonomy of Cognitive Domain. By comparing mothers’ language input during toy play; we try to find out how mothers interact differently on the cognitive levels depending on their SES. Within the framework outlined so far, we tried to achieve an answer to the following research question:

What kind of, if any, SES-related differences are found between mothers’ language input with regard to Bloom’s Taxonomy of Cognitive Domain in the context of toy play?

2. Method

2.1. Participants

Ten mothers and their five-year old preschoolers participated in this study. Families were married, with both parents living in the home. They all lived in İzmir and were native Turkish speakers. Mother participants ranged in age from 30 to 40 years, with a mean of 34.9 years. The average age of high SES mothers was 34.4 and that of low SES mothers was 35.4. Table 1 provides demographic information on the mothers contributed to this study. Low SES families had only a primary or secondary school education, and lived in suburban areas, whereas high SES mothers had completed four years of college (n=2) or received a master’s degree (n=3), and lived in distinguished districts of İzmir. All children attended nursery schools in their neighborhoods on weekdays.
2.2. Data collection procedure

Participants were selected by means of purposive and snowball sampling methods. After obtaining the mothers’ consent to participate in the research, the mother-child dyads were visited at home by the two researchers. Before the observational session, each mother was interviewed regarding her education, age and employment. After the interview process, each mother-child dyad was invited into a separate room. The mothers were instructed to play with their children for about 20 minutes the way they usually would do with the building blocks.

The picture below was shown to the mother-child dyads and they were told either to use the blocks to build what they see in the picture or that they were free to construct whatever they wanted. As illustrated in Figure 3, the toys used in this context were building blocks with a set of wooden blocks. They had different colors and shapes and contained a little bell, ramps and glass marbles. The researchers placed two voice recorders on the floor and were not present in the room during the recording in order to make the mothers and children feel comfortable.

2.3. Data analysis

The mother-child interactions were transcribed verbatim and the flow of speech for mothers was divided into utterances, where an utterance is defined as a conversational turn that contains one or more syntactic units and it is usually preceded and followed by a pause (Huttenlocher et al., 2010). Two or more independent clauses, occurring within the same conversational turn were considered as separate utterances.
Transcripts were analyzed and mothers’ utterances were ascribed to the corresponding level of Bloom’s Taxonomy of Cognitive Domain using the revised taxonomy. Thus, each utterance was categorized as one of the six cognitive levels, i.e. remember, understand, apply, analyze, evaluate or create. Besides, a reliability measure was applied; both researchers coded the utterances separately and verified their results by comparing the codes for each utterance. Reliability was at least 95%, and conflicts were resolved through comparing codes and discussing differences. Since the total number of utterances differs for high SES and low SES mothers, the results of this analysis are presented in raw numbers and also in percentages to show the distribution of utterances between the two groups. Statistical analyses were performed on the results to determine significance levels. As the sample size of the study was small, a nonparametric test, two-independent-sample test, Mann Whitney U was applied using SPSS statistical packages (version 13.0). Statistical significance for all measures was deemed at p<0.10 based on two-independent-sample test.

3. Results

In this study, we aimed to examine the link between mothers’ education level and their language input with regard to Bloom’s Taxonomy of Cognitive Domain. In Table 2, the percentages and the raw numbers (in parentheses) of utterances are given. As shown in the table, 95.1% of the utterances of low SES mothers and 85.6% of high SES mothers’ were coded in the remember level; that is, both groups of mothers produced the most utterances in remember which is the lowest thinking level of Cognitive Domain. As for the other levels, the proportions of mothers’ utterances were less than 10% in the understand, apply and evaluate levels; in the analyze and create levels only high SES mothers produced utterances.

<table>
<thead>
<tr>
<th>Table 2. Overall distribution of mothers’ utterance levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remember</td>
</tr>
<tr>
<td>High SES  Mothers</td>
</tr>
<tr>
<td>(924)</td>
</tr>
<tr>
<td>Low SES  Mothers</td>
</tr>
<tr>
<td>(677)</td>
</tr>
</tbody>
</table>

Total utterances produced by high SES versus low SES mothers in terms of Cognitive Domain are given also as a graph in Figure 4 below:

Figure 4. The total number of utterances produced by high vs. low SES mothers.
The data presented in Table 2 and Figure 4 show the percentages and the numbers of mothers’ utterances as two separate groups; that is, high SES vs. low SES. Results presented in Figure 4 show that high SES mothers used a greater number of utterances in each level than low SES mothers during the mother-child play session. In other words, mothers who had a higher education produced more utterances during toy play (high SES: 1080, low SES: 712).

### Table 3. Test Statistics on total number of utterances

<table>
<thead>
<tr>
<th>Ranks</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>5</td>
<td>6.80</td>
<td>34.00</td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>4.20</td>
<td>21.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistics&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Total Utterances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>6,000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>21,000</td>
</tr>
<tr>
<td>Z</td>
<td>-1.358</td>
</tr>
<tr>
<td>Asymp.Sig. (2-tailed)</td>
<td>.175</td>
</tr>
<tr>
<td>Exact Sig. [2*(1-tailed Sig.)]</td>
<td>.222&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Not corrected for ties.

<sup>b</sup> Grouping Variable: Group_No

However, as seen in Table 3, the difference between the total number of utterances and the SES of mothers is statistically not significant (p=.175>.10).

Since the sample size was small (n=10) and none of the low SES mothers produced any utterance in the levels of analyze and create, and only one mother produced one utterance in the understand level and again only one mother produced two utterances in the apply level, statistical analysis could be applied only to the levels of remember and evaluate. As mentioned before, due to the smallness of the size of the sample, whether there was a difference between the numbers of utterances of the two groups on the levels of remember and evaluate was analyzed by nonparametric test, two-independent-sample test, Mann Whitney U analysis using SPSS statistical packages (version 13.0).

### 3.1. Remember Level

### Table 4. Test Statistics on the remember level

<table>
<thead>
<tr>
<th>Ranks</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>5</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>8.00</td>
<td>40.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistics&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Remember</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>15,000</td>
</tr>
<tr>
<td>Z</td>
<td>-2.619</td>
</tr>
<tr>
<td>Asymp.Sig. (2-tailed)</td>
<td>.009</td>
</tr>
<tr>
<td>Exact Sig. [2*(1-tailed Sig.)]</td>
<td>.008&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Not corrected for ties.

<sup>b</sup> Grouping Variable: Group_No

Table 4 shows that the p-value is smaller than the level of significance (0.10). Thus, the difference between the mothers’ SES and the proportion of utterances in the remember level is statistically significant (p=.009<.10).

Taken from our data, examples (1) from high SES and (2) from low SES mothers represent the remember level.

1. Sen ne olduğunu biliyor musun bunların?  
   *Do you know what these are?*  
   (high SES mother 5)

2. Kırımı mı o?  
   *Is that red?*  
   (low SES mother 3)
3.2. Evaluate Level

Table 5. Test Statistics on the evaluate level

<table>
<thead>
<tr>
<th>Ranks</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>5</td>
<td>7.80</td>
<td>39.00</td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>3.20</td>
<td>16.00</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistics(^b)</th>
<th>Evaluate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>1,000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>16,000</td>
</tr>
<tr>
<td>Z</td>
<td>-2.440</td>
</tr>
<tr>
<td>Asymp.Sig. (2-tailed)</td>
<td>.015</td>
</tr>
<tr>
<td>Exact Sig. [2*(1-tailed Sig.)]</td>
<td>.016(^a)</td>
</tr>
</tbody>
</table>

a. Not corrected for ties.

As mentioned earlier, since low SES mothers produced very few utterances in the understand and apply levels, and only high SES mothers produced utterances in the analyze and create levels, statistical tests could not be applied to these levels. Examples (5)-(10) represent these levels.

(3) Evet senin bakış açına göre mantıklı

*Yes, it makes sense from your point of view.*

(4) Çok güzel

*Very good.*

Examples (3) from high and (4) from low SES are the examples of evaluate level.

(5) Sen beni yönlendir, çünkü ben ne yapacağımı bilmiyorum.

*Guide me, because I don’t know what to do.*

(6) Sen çok değdiğin için sallanyor.

*Because you touch it too much, it wobbles.*

(7) Su parkındaki kaydıraklar da böyle renkliydi.

*The slides in the aqua park were also in the same color.*

(8) Kendini ana sınıfındaymışsın gibi hisset.

*Feel yourself as if you were in the kindergarden.*

(9) Bu oyuncagın hangi kısmını değiştirelim?

*Which part of this toy shall we change?*

(10) Kule dışında başka bir şey yapabilir miydik?

*Could we build something other than a tower?*
4. Discussion

In the present study, quantitative and qualitative data provided a complementary framework for understanding the relationship between SES and the mothers' levels of utterances. Our basic question in this study was whether and to what extent SES-related differences were found between mothers’ language input in terms of Bloom’s Taxonomy of Cognitive Domain. Results from the present study revealed two key findings regarding mothers’ language use during toy play session with their five-year old children. First, as illustrated in Table 2, the most frequent type of utterance employed by mothers was the remember level. Thus, mother-child interaction was dominated by lower-order utterances in which utterances were generally indicative and children were given information and expected to parrot back answers. These lower-order utterances do not allow for discussion of problem-solving strategies and mental activities necessary to respond to more higher-order thinking skills. Research on the theory of cognitive domain revealed that excessive use of lower cognitive input may not support the development of children’s critical thinking.

Another key result from the present study was the use of higher-order utterances by high SES mothers. Our results suggest that socioeconomic status and education has a positive causal effect on mothers' language use as the frequency and level of utterances changed in high SES mothers. Previous studies have demonstrated differences in speech depending on the SES of mothers. We extended this line of research on mother-child interaction by providing evidence that SES also plays a role in mothers’ utterances on higher cognitive levels. Mothers' high-order utterances can serve as scaffolding to support their children's construction of conceptual understanding. This scaffolding helps children to think at the higher levels which challenges and facilitates cognitive engagement. In other words, higher-order utterances provide children opportunities to verbally express their ideas, promote higher level thinking, and foster engagement. Thus, whether a child develops preliteracy skills in early childhood depends fully on parents’ literacy and the child's exposure to higher-order language input. Instruction practices at home predict children’s cognitive and language development and later school achievement (Leseman, 2002).

When considering the details, it becomes clear that socioeconomic status of mothers lead to an increase in the use of higher-order utterances. Higher-order language input contributes importantly to the development of cognitive and language skills, providing their children with a head start in primary school when formal schooling starts.

5. Conclusions

This study examined maternal language input in terms of Bloom’s Taxonomy of Cognitive Domain in the context of toy play. The major finding of the study is that the variances between the two groups of mothers were significantly different in the proportion of mothers’ utterances. Both groups of mothers produced the most utterances in the remember level in terms of both proportion and number. As for the other levels, while high SES mothers produced utterances in all levels, low SES mothers produced no utterance in the analyze and create levels. In these levels, high SES mothers produced utterances but very few. In the understand level, high SES mothers produced 50 utterances, however, low SES mothers produced only one utterance in this level. In the evaluate and apply levels again high SES mothers produced more utterances than low SES mothers.

This study was limited in that sample size (n=10) was small. Another limitation was the non-homogeneity of mothers’ personal characteristics. And finally, this study looked at the maternal language only within the context of toy play and in terms of Bloom’s Taxonomy of Cognitive Domain. Since it was a cross-sectional study and the sample was not representative, the mothers
cannot be generalized to the general population of mothers. Thus, generalization of our results requires some caution, and the limitations of the study should be borne in mind.

The present study can be regarded as to have extended existing literature on mother-child interaction. Future multidisciplinary studies are needed to investigate maternal language input in different contexts with a greater number of participants. Research suggests that increasing parental education has a positive causal effect on children’s earnings. The aims are to promote the cognitive and pre-literacy competence of children from low SES communities in order to provide them with a fair start in elementary school.

Acknowledgements

This study is the result of great effort on the part of many people. We thank the mothers and families who agreed to let us into their homes and lives. Without their cooperation, this study would not have been possible.

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'Oyun oynama' bağlamında Türk anne-dili üzerine bir çalışma

Öz

Anahtar sözcükler: Anne dili, dil girdisi; Bloom’un Taksonomisi, çocuk-yönlendirmeli dil, anne-çocuk etkileşimi
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