**Supplementary Material**

**Table 7**

*Descriptive Statistics of Children Regarding Nursery Attendance Status (Talker Variability as Continuous Variables)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | *No-Nursery Children a*  *(N = 19)* | | *Nursery-Attending b Children (N = 26)* | |
| *Mean* | *SD* | *Mean* | *SD* |
| Age in Months | 26.63 | 2.41 | 26.58 | 1.94 |
| Daily Conversation Time (h) | 8.78 | 4.06 | 6.31 | 2.10 |
| Daily Media Time (h) | 1.32 | 1.14 | 0.86 | 0.75 |
| Total Mature Talkers | 3.89 | 2.23 | 3.35 | 1.90 |
| Mature Family Talkers | 2.16 | 0.60 | 2.08 | 0.48 |
| Total Child Talkers | 0.68 | 0.75 | 0.19 | 0.40 |
| Child Family Talkers | 0.68 | 0.75 | 0.12 | 0.33 |
| Total Pre-school Talkers | 0.79 | 1.18 | 0.69 | 1.16 |
| Pre-school Family Talkers | 0.37 | 0.50 | 0.35 | 0.49 |
| Vocabulary Size | 441.16 | 323.60 | 428.58 | 286.01 |

a Children Who Never Attended Nursery Schools

b Children who attended nursery schools five days a week. Children who attended nursery schools less than three days a week (4) and children who had attended before (1) were excluded.

Table 7 showed the descriptive statistics of children who attended nursery schools regularly (five days a week) and children who did not attend. Table 8 showed descriptive statistics of nursery related variables.

We compared the variables between the two groups with T test. Children who never

attended nursery school had longer daily communication time than children who attend to

**Table 8**

*Descriptive Statistics regarding Nursery-Related Variables of Nursery-Attending Children c (N = 26)*

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | *Mean* | *SD* | Range |
| Nursery Starting Age in Month | 15.16 | 6.21 | 6–26 |
| Daily Duration Time in Nursery (h) | 9.49 | 1.35 | 7.00–12.00 |
| Number of Teachers | 8.12 | 4.48 | 2–25 |
| Number of Children at Class | 17.73 | 4.39 | 7–25 |
| Teacher/Student Ratio (%) | 47.73% | 28.52% | 16%–156% |

c Nursery-Attending Children = children who attend to nursery school five days a week.

nursery five days a week (*t* = 2.656, *p* = .011). Nursery-attending children also had less child talkers (*p* < .0*1*) than children who stayed at home. However, children with different nursery attendance status showed no significant difference in vocabulary size (Kruskal-Wallis test, *t* = 0.584, *p* = .747). No significant differences were found in birth-order, gender, and mother’s academic level (*n.s.)* between children who attended nursery school regularly and those who did not*.*

Then, we examined the contribution of variables related to nursery schools to vocabulary development as follows.

The daily duration time at a nursery negatively related to children’s vocabulary size (*t* = -3.15, *p* = .005, 95%*CI*: -180.10 〜 -36.50). However, the daily duration at a nursery was also negatively correlated with children’s daily conversation time outside the nursery ( *β* = -.62, *t* = -3.07, *p* = .002, 95%*CI*: 8.52 〜 33.06), while the daily conversation time positively correlated with the vocabulary size (*β* = .47, *t* = 2.89, *p* = .009, 95%*CI*: 17.08 〜 106.81). The correlation between daily duration at nursery and vocabulary size dropped to be insignificant when counting the daily communication time (out of nursery) as a mediate variable (*β* = -.24, *t* = -1.40, *p* = .178, 95%*CI*: -3896.88 - 24.76). That is, children who spent longer time in nursery school daily had shorter daily conversation time outside the nursery as a trade-off. And such shorter daily communication time was related to a smaller vocabulary size. No other nursery-related variables were found related to vocabulary size.

To verify the assumption that children at the first half of their third year might only able to benefit from intensive talker variability, whereas older children might benefit from talkers including the non-intensive ones, we conduct regression analysis similar to Table 6 in the manuscript among children who were aged below 2;6 (*N* = 47; Table 9; Total adult variability coded as 0 (18); Intensive adult talker variability coded as 0 (22); Non-intensive adult talker variability coded as 0 (31)) and those who were aged 2;6 or above (*N* = 128; Table 10; Total adult variability coded as 0 (52); Intensive adult talker variability coded as 0 (79); Non-intensive adult talker variability coded as 0 (95)) respectively. The results were briefly reported in the results section of Study 2 in the manuscript.

**Table 9**

*Hierarchical Regression Analyses Predicting Productive Vocabulary Scores Among Children Aged Below 2;6*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | *(a)Total Adult Talkers* | | | *(b)Intensive and Non-intensive Adult Talkers* | | |
|  | *Predictors* | *R2 adj* | *ΔR2* | *β* | *R2 adj* | *ΔR2* | *β* |
| Step 1 |  |  | .045 |  |  | .045 |  |
|  | Gender |  |  | -.025 |  |  | -.025 |
|  | Birth-Order |  |  | .199 |  |  | .199 |
|  | Mother’s Academic Level |  |  | -.034 |  |  | -.034 |
| Step 2 |  | -.033 | .035 |  | -.033 | .035 |  |
|  | Gender |  |  | -.022 |  |  | -.022 |
|  | Birth-Order |  |  | .151 |  |  | .151 |
|  | Mother’s Academic Level |  |  | -.033 |  |  | -.033 |
|  | Age in Months |  |  | -.194 |  |  | -.194 |
|  | Daily Conversation Time |  |  | .001 |  |  | .001 |
| Step 3 |  | .136 | .056 |  | .016 | .086 |  |
|  | Gender |  |  | .007 |  |  | -.009 |
|  | Birth-Order |  |  | .139 |  |  | .162 |
|  | Mother’s Academic Level |  |  | -.011 |  |  | -.001 |
|  | Age in Months |  |  | -.230 |  |  | -.203 |
|  | Daily Conversation Time |  |  | .027 |  |  | -.008 |
|  | Total Adult Talker Variability |  |  | .244 |  |  |  |
|  | Intensive Adult Talker Variability |  |  |  |  |  | .284 |
|  | Non-intensive Adult Talker Variability |  |  |  |  |  | .030 |
| *N* | 47 |  |  |  |  |  |  |

*Note.* \* *p* < .05, \*\* *p* < .01 (two-tailed).

**Table 10**

*Hierarchical Regression Analyses Predicting Productive Vocabulary Scores Among Children Aged 2;6 or Above*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | *(a)Total Adult Talkers* | | | *(b)Intensive and Non-intensive Adult Talkers* | | |
|  | *Predictors* | *R2 adj* | *ΔR2* | *β* | *R2 adj* | *ΔR2* | *β* |
| Step 1 |  |  | .088\*\* |  |  | .088\*\* |  |
|  | Gender |  |  | .227\* |  |  | .227\* |
|  | Birth-Order |  |  | -.019 |  |  | -.019 |
|  | Mother’s Academic Level |  |  | .177\* |  |  | .177\* |
| Step 2 |  | .052 | .001 |  | .052 | .001 |  |
|  | Gender |  |  | .229\* |  |  | .229\* |
|  | Birth-Order |  |  | -.017 |  |  | -.017 |
|  | Mother’s Academic Level |  |  | .177\* |  |  | .177\* |
|  | Age in Months |  |  | .028 |  |  | .028 |
|  | Daily Conversation Time |  |  | .020 |  |  | .020 |
| Step 3 |  | .072 | .026† |  | .067 | .029 |  |
|  | Gender |  |  | .223\* |  |  | .237\*\* |
|  | Birth-Order |  |  | -.016 |  |  | -.010 |
|  | Mother’s Academic Level |  |  | .192\* |  |  | .187\* |
|  | Age in Months |  |  | .012 |  |  | .007 |
|  | Daily Conversation Time |  |  | .008 |  |  | .011 |
|  | Total Adult Talker Variability |  |  | .164† |  |  |  |
|  | Intensive Adult Talker Variability |  |  |  |  |  | .055 |
|  | Non-intensive Adult Talker Variability |  |  |  |  |  | .156 |
| *N* | 128 |  |  |  |  |  |  |

*Note.* †*p* ≤.06, \* *p* < .05, \*\* *p* < .01 (two-tailed).

To examine the assumption that talker variability facilitates lexical growth by promoting children’s word recognition ability regardless of acoustic fluctuations in pronunciation, we set a question about *children’*s *listening accuracy of spoken words*: “How frequently does your child fail to identify a familiar word spoken by non-family members, though they can recognise it when spoken by a family member?” on a scale of 1–4 (1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *always*). We obtained a score for the frequency of successful spoken word recognition by reversing the point. 95 mothers reported “rarely” (54.6%; scored as 4), 44 chose “sometimes” (25.3%), 22 answered “often” (12.6%), and 13 selected “always” (7.5%; scored as 1).

Child’s spoken word recognition accuracy was associated with vocabulary marginally (*r* = .143, *p* = .060). However, children’s spoken word recognition accuracy did not correlate with total (Cramer’s *V* = .137, *p* = .351) or intensive (Cramer’s *V* = .187, *p* =.106) adult talker variability.