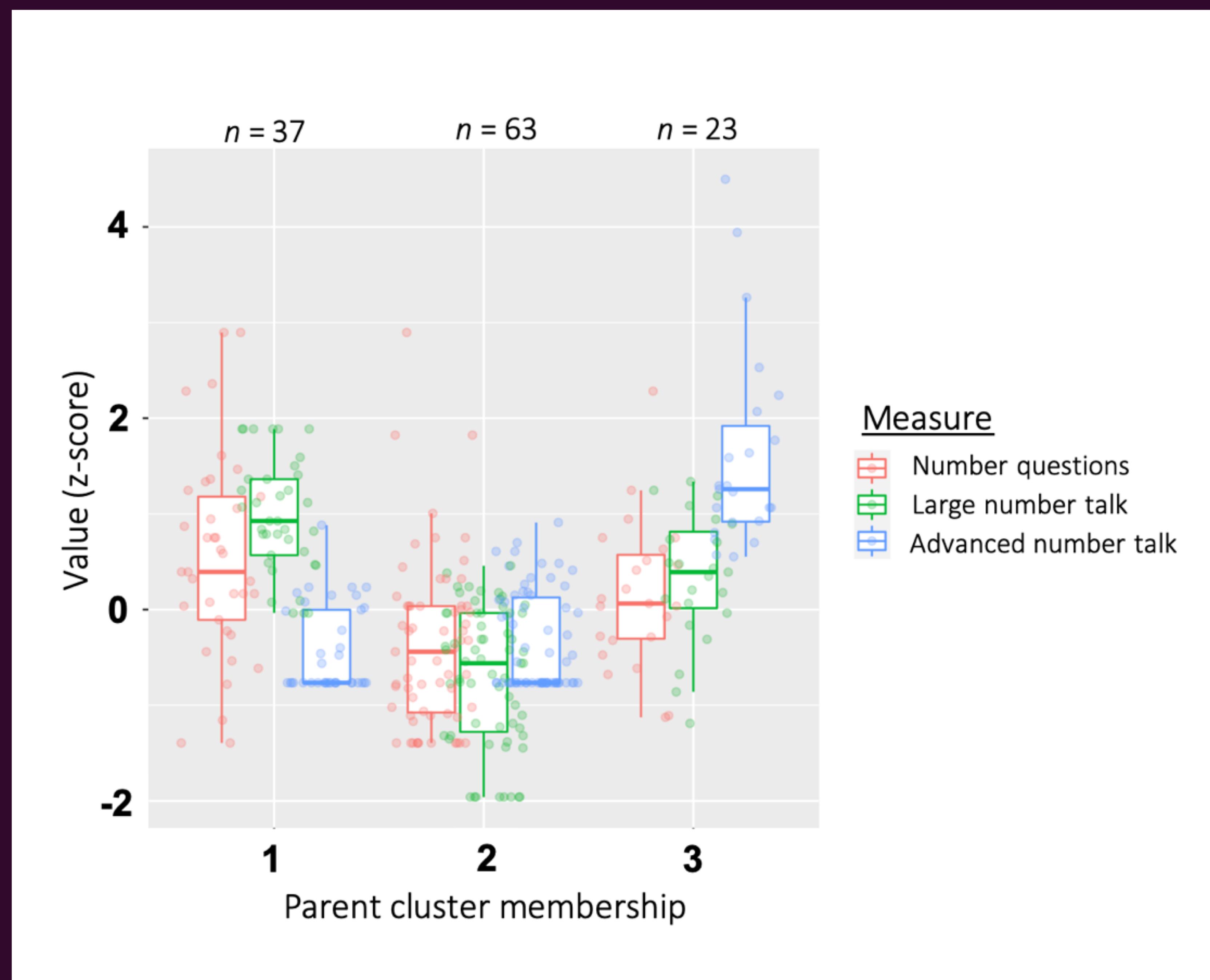


Parents' combined use of different forms of number talk, not each type of talk by itself, is linked with preschoolers' early math.

A k -means cluster analysis ($k=3$), using the proportion of parents' number questions, large number talk (NT), and advanced NT, revealed **three parent number-related interaction styles**.



The optimal number of clusters was determined using the elbow, average silhouette, and gap statistic methods. We found three groups of parents who provided consistently low NT overall (Cluster 2), greater proportions of large than advanced NT (Cluster 1), and greater proportions of advanced NT compared to large NT and Qs (Cluster 3).

Exploring patterns of parents' number talk engagement and preschoolers math skills

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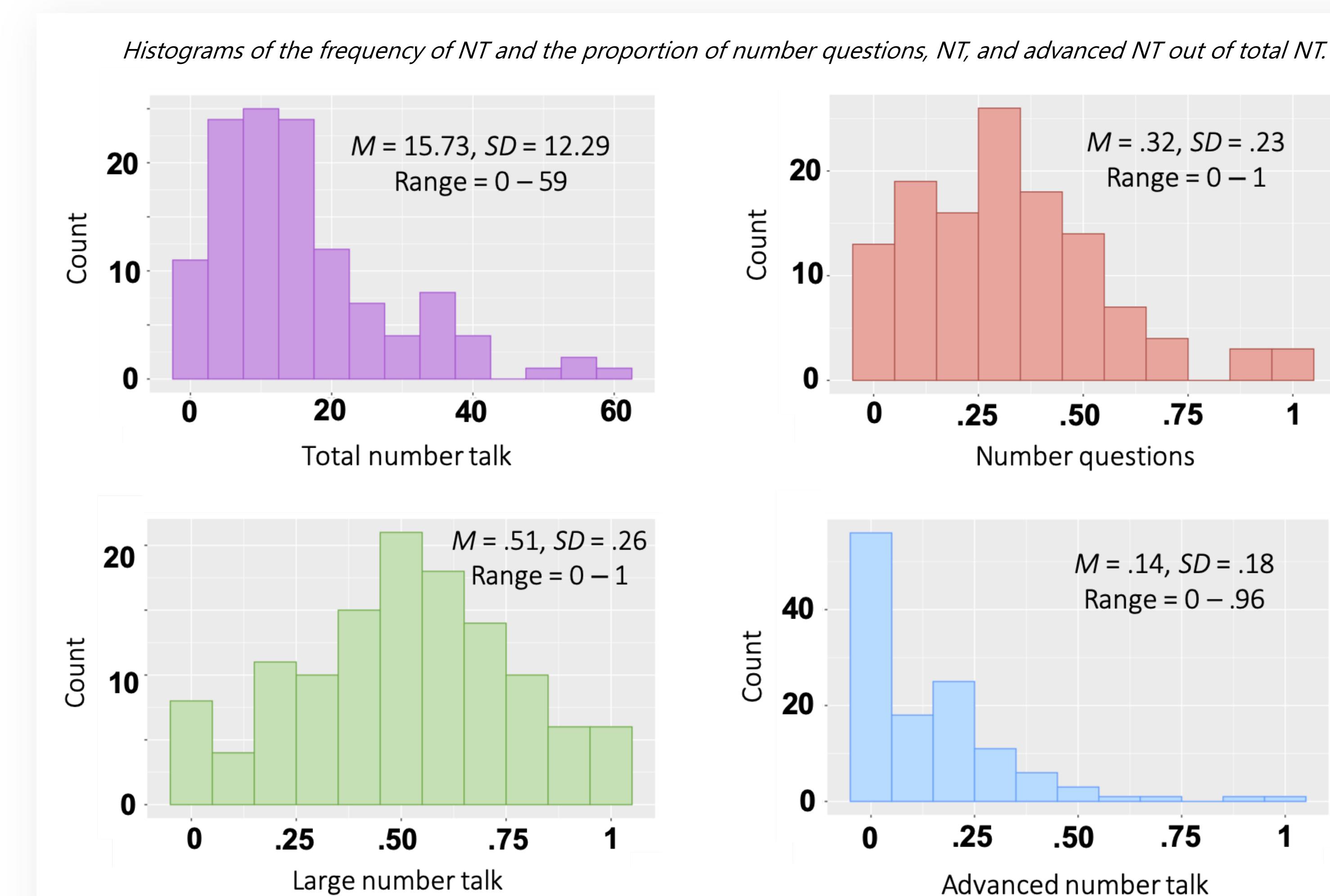
Method

- Parent-child dyads ($n = 123$; 94% mothers; child age: $M = 4.40$ years, $SD = 3.60$ months) engaged in play with grocery store toys for ~8 minutes each.
- Median yearly household income = \$97,000 ($M = \$105,438$, $SD = \$70,351.65$)
- Most parents ($n = 90$) reported having at least a Bachelor's degree
- Their interactions were video recorded, transcribed verbatim, and coded for different types and proportions of number talk (NT) utterances:
 - Number questions**
 - Large (#'s >4)**
 - Advanced (cardinality, arithmetic)**
- Children completed the Woodcock-Johnson Applied Problems (WJ AP) subtest.



e.g., "one two three four **five six** so how much money [would] you give me back from ten?"

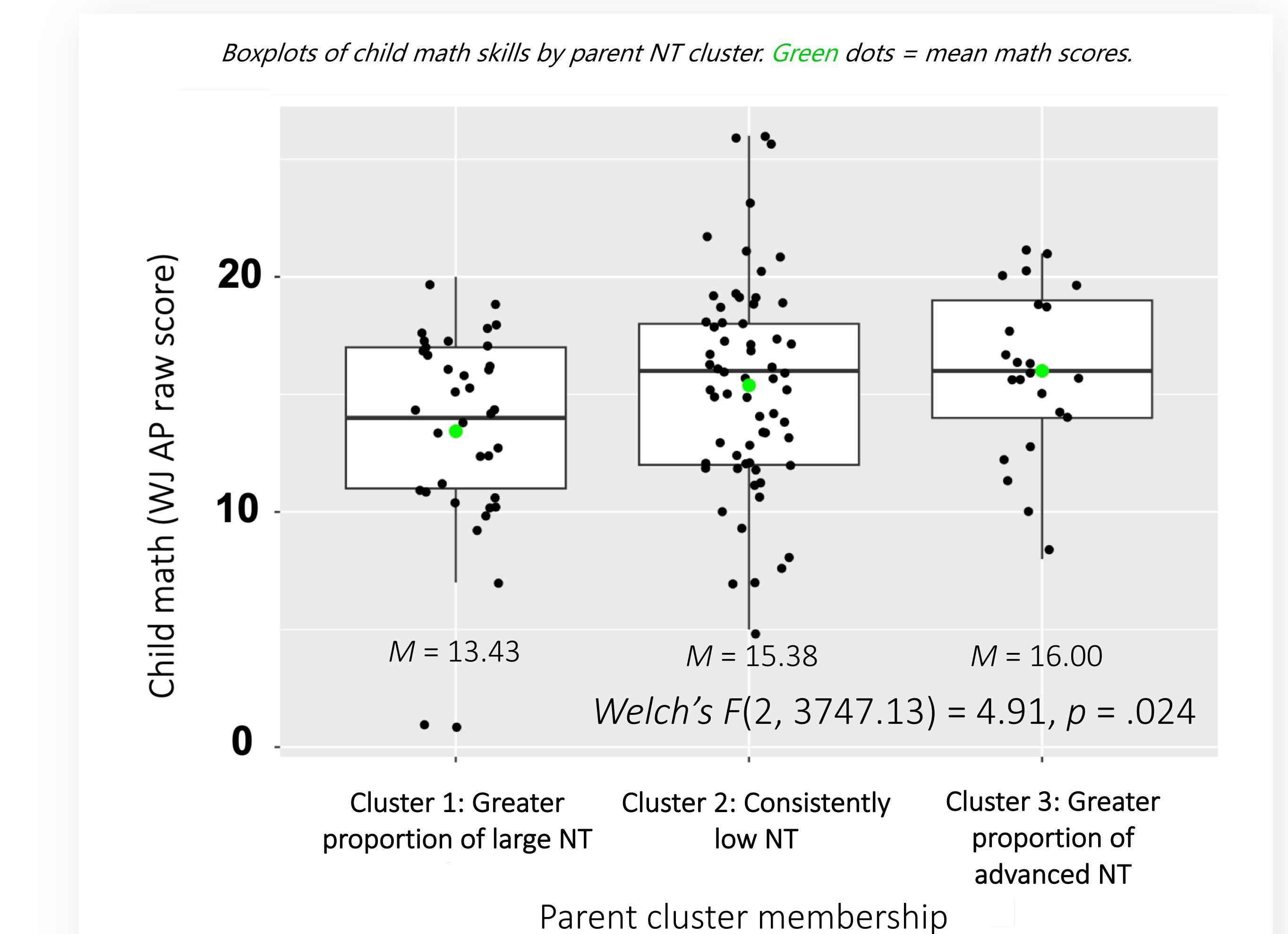
Parental **number talk (NT) varied considerably** in type and occurrence (proportion of total NT).



Proportions of number talk were **not significantly correlated** with each other or child math.

	1	2	3
1. Number questions	--		
2. Large NT	.16	--	
3. Advanced NT	.05	.13	--
4. Child WJ AP scores	-.12	-.02	.09

Parents' number-related **interaction styles were associated with child math skills**.



Pairwise contrasts revealed that parents who used greater proportions of advanced NT had children with significantly greater math scores than parents who used greater proportions of large NT.

NOTE: The absolute frequencies of each type of NT were also examined. These frequency variables were highly correlated with each other (but not with child math skills) and produced non-informative clusters.