Supplemental Material S2. Lexical integration.

Procedure. The purpose of this task was to determine whether lexical integration varied with training condition, time, or learner group. We followed the procedures in Countache & Thompson-Schill (2014) with four modifications. We used more words (24 vs 16) and more exposures (4 vs. 2). We employed a within-subject design whereas they assigned the fast mapping and explicit-encoding conditions between subjects. We used a different analytic approach; they used t-tests to compare the difference in reaction time (RT) in response to English hermits vs English neighbors of words that had been trained in explicit encoding or fast mapping. Our statistical analysis is described below.

In the lexical integration task, the participant was asked to classify each of 12 critical words (neighbors of words from the relevant training condition) and 12 filler words (hermits not used as neighbors for trained words) as natural kinds or artefacts as quickly and accurately as possible by pressing the left or right shift keys. For half of the participants the right shift key was used for the Natural category and the left shift key for the Artefact category; the assignment of keys was reversed for the other participants. Each trial began with a fixation point displayed for 800 ms, followed by a blank screen for 350 ms, followed by the target for 500 ms and feedback (correct, incorrect) for 1 second. RT was measured from the presentation of the target to the key press. Lexical competition was measured as the difference in response times to the English hermits used to form trained words (now neighbors) and the unused English hermits.

Because RT was the critical dependent variable, we established baseline RTs in response to a familiar word and referent before the training conditions. Participants saw 18 picture plates on a desktop computer screen, each presenting a circle, square and triangle in varied positions. For each plate, they were asked to click the circle with a mouse as quickly as possible. RT was measured in milliseconds from the onset of the name to the click.

When analyzing the lexical integration data, it was apparent that the RT was skewed to the right. We removed RTs longer than 4000 milliseconds and took the log reaction time to approximate normality. Predictor variables were learning context (explicit encoding, fast mapping), time (1, 2), learner group (TD, DLD), and sex (F, M). We also examined order effects, neighbor status (hermit or neighbor of a trained word) while adjusting for baseline RT. We used a linear regression model with a compound symmetry covariance matrix to account for repeated observations by block and time.

Results. We found that day 2 was significantly faster than Day 1 (beta = .16, $t(47) = 22.76$, $p < .0001$), and the TD group was significantly faster than the DLD group (beta = .14, $t(41) = 2.55$, $p = .0145$; see Table S1, below). Critically, there was no effect of hermit vs neighbor, even in the TD group. Therefore, we failed to replicate Countache and Thompson-Schill (2014).

Table S1. Solution for Fixed Effects

Effect	Referent	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		6.5222	0.1799	43	36.25	<.0001
Train	EE	0.008325	0.007163	47	1.16	0.2510
Time	T1	0.1630	0.007162	47	22.76	<.0001
Dx	DLD	0.1938	0.05470	43	3.54	0.0010
Sex	F	0.02726	0.05341	43	0.51	0.6123
Order	EE-FM	-0.00456	0.05332	43	-0.09	0.9322
Neighbor	Hermit	-0.00956	0.007162	47	-1.33	0.1884
Baseline RT		0.000376	0.000207	43	1.82	0.0763

Note. EE = explicit encoding; T1 = time 1; DLD = developmental language disorder; F = female; EE-FM = explicit encoding ordered before fast mapping; RT = reaction time.

In light of this failure, we re-analyzed a subset of the data using the exact procedures for trimming outliers (removing responses faster than 300 ms and slower than 1.5 ms) and the exact statistical procedures used in Countache and Thompson-Schill (2014). We considered the first administration of the lexical integration test only, with the TD participants who had been assigned to do fast mapping first compared to the TD participants who had been assigned to do the explicit encoding first (thereby mimicking the between-subject design in Countache and Thompson-Schill, 2014). We again failed to replicate the finding that responses to English neighbors of trained words were faster than responses to English hermits in the fast mapping condition, $t(19) < 1$, $p = .98662$.

Without evidence that the typical adults integrated newly learned words into their lexical network, we were unable to draw any conclusion about the lack of effect among the adults with DLD. We should point out that Countache and Thompson-Schill (2014) was a two-part study and in the second part, they did replicate their finding from part one. We hypothesize that the differences in our stimuli or numbers of exposures to those stimuli compared to theirs eliminated the effect, a hypothesis that can guide future exploration of the integrity of lexical integration after fast mapping.

Reference

Coutanche, M. N., & Thompson-Schill, S. L. (2014). Fast mapping rapidly integrates information into existing memory networks. *Journal of Experimental Psychology: General, 143*(6), 2296–2303.