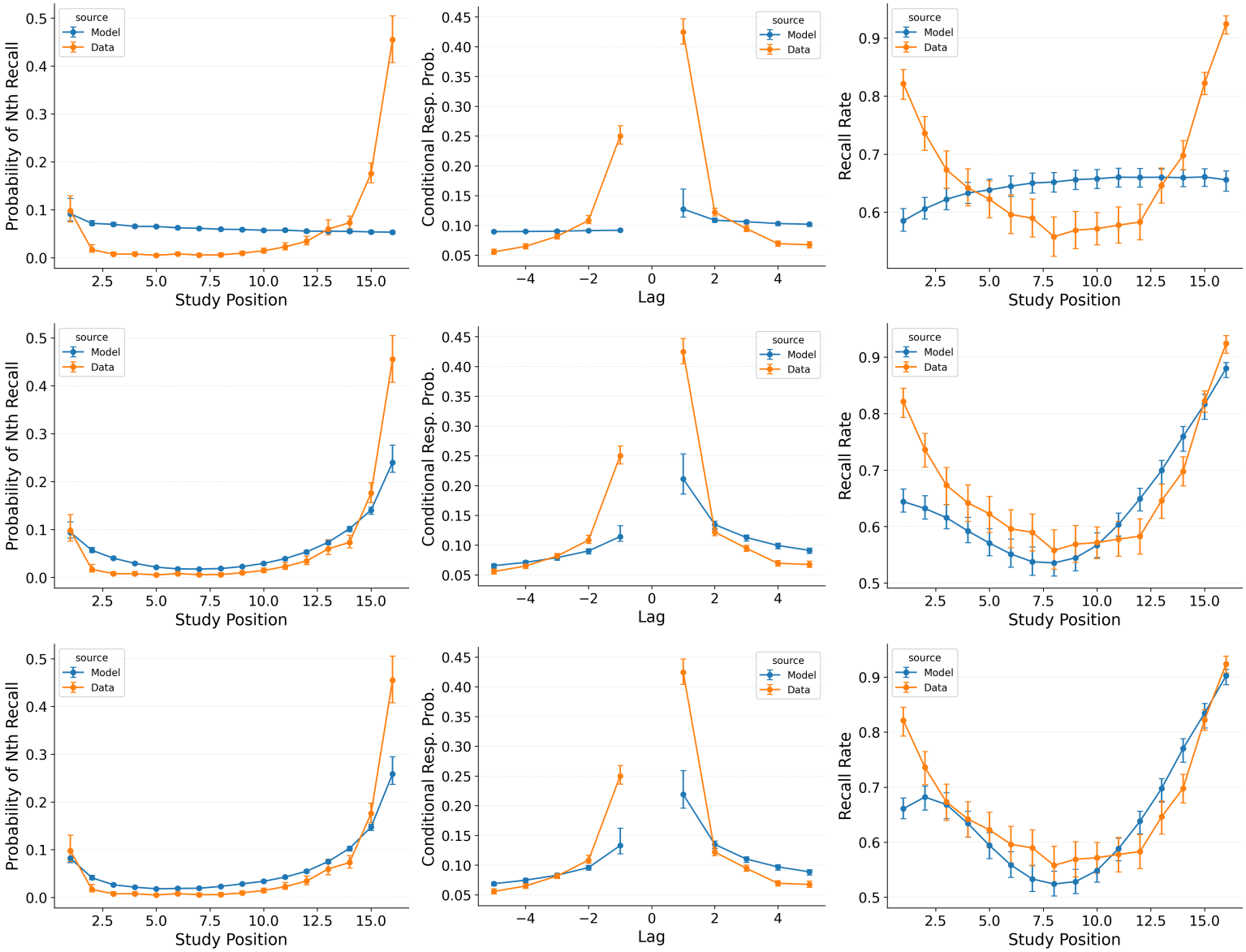

Figure 2: Summary statistic fits of baseline CRU (**Top**), CRU with free start context integration rate β_{start} (**Middle**), and CRU freeing both start context integration rate (β_{start}) and primacy gradient (ϕ_{s} and ϕ_{d}) parameters (**Bottom**) to PEERS free recall data. **Left**: probability of recall initiation by serial position. **Middle**: conditional response probability as a function of lag. **Right**: recall probability by serial position.

Alt Text. A comparison of three CRU variants against empirical free-recall patterns. Rows index by model variants: Top: baseline CRU; middle: CRU with a free start-context integration rate (β_{start}); bottom: CRU with both β_{start} and an associative primacy gradient (ϕ_{s} and ϕ_{d}). Columns index summary measures. First-recall curve (left column): probability that recall begins with each serial position. A steep rise at the end marks the recency effect (late items recalled first); a smaller peak at the start marks the primacy effect (early items sometimes recalled first). Lag-CRP (center column): probability of transitioning between recalled items separated by a given study lag. Tall bars at +1 show the forward short-lag preference; smaller bars at –1 show a smaller preference for backward short-lag transitions. Serial-position curve (right column): overall recall probability for each position—high at the start (primacy) and end (recency). Take-away: Freeing β_{start} lets the model capture the strong recency start, while adding the primacy gradient boosts early-item recall and heightens ±1 lag peaks, bringing all three panels much closer to the data.