

# Shining in the Center: Central Gaze Cascade Effect on Product Choice

Selin Atalay  
H. Onur Bodur  
Dina Rasolofoarison

**Purpose:** How can eye-tracking be used to explain the process underlying consumers' tendency to choose the option at the center of an array.

## **Show that visual attention drives effect**

- Central gaze cascade effect: Progressive increase in visual attention to central option just prior to decision
  - More frequent eye fixations
  - Looked at for longer total duration
- Rule out inferences about centrally located items
- Memory-based attention measures not correlated with choice
- Rule out initial fixation bias

# Sample

- Study 1A: Inclusion/exclusion:
- 67 students used in the study
- 4 Excluded “due to technical problems in eye tracking and incomplete measures”
- The average age was 20.4 (SD = 0.8), and 54% were females.

# Procedure and Stimuli Design

Brand A Product 1	Brand B Product 1	Brand C Product 1
Brand A Product 2	Brand B Product 2	Brand C Product 2
Brand A Product 3	Brand B Product 3	Brand C Product 3

Vitamins supplements and meal replacement bars.

# Measurement

- Eye tracker: Each participant was seated in front of a Tobii 1750 eyetracker
  - 17 inches wide, with a resolution of 1,280 x 1,024 pixels and a frequency of 50 hertz (i.e., the screen is refreshed 50 times per second).
  - Discreet infra-red camera (located below the screen) recorded gaze “unobtrusively.”
- Calibration: In the calibration phase, each participant is asked to follow a series of blue dots moving along the screen.
  - Participants can wear reading glasses or contact lenses.
  - They are free to move their heads freely within a region of 30 centimeters x 15 centimeters x 20 centimeters and a distance of 60 centimeters from the screen. There are no physical restrictions on headgear.”
  - Viewing time in testing phase was unconstrained

# Extracting Signal from 'Noise'

- To ensure information acquisition per each fixation, fixations that lasted less than 100 millisecond were eliminated.
  - Results do not change with a 200 millisecond cut-offs.
- To create realistic distinctions among the brands, a different background color was used for each brand package (pre-test performed in color selection).
- Used fictitious brand names, three variants (counter-balanced), used brand name as a control variable in analysis.

# Fixation Analysis

- Fixation Frequency DV
  - Freeman-Tukey transformation was used to meet normality assumption on count data
  - Each item had more than two fixations (each brand variant was noted and reexamined)
- Total Fixation Duration DV
  - Natural Log transformation was used to meet normality assumption
- Brands in horizontal center received:
  - More frequent eye fixations (60.9 vs 48.7,  $p < .01$ )
  - Longer total duration (15.1 seconds vs. 12.6 seconds,  $p < .05$ )
  - More choice likelihood (45.3% vs 27.3%,  $p < .01$ )

# Inference and Recall Measures

- Horizontal location predicted choice but not brand inferences or brand recall.
- Evidence that visual attention and memory-based attention are independent constructs.
- Inference-Making DV
  - Quality, popularity, attractiveness ratings of each product's brand (1-7 scale)
  - Estimate market share and retail space they would provide for brand
  - Rate how much attention they think each brand/package captures (1-9 scale)
- Memory-based Attention: Recall DV
  - Write the name of the brand that was chosen
  - Choose name of brand chosen from a list



# Gaze Pattern Analysis

- Gaze pattern: Temporal pattern of fixations
  - Undertaken to understand the underlying explanation for the visual attention process
    - Is higher visual attention in the final few seconds drive brand choice?
- Procedure:
  - Divide the gaze duration into time bins (20 milliseconds each) - Replication with different time bins lead to similar results.
  - In each time bin, 0-1 coding of whether participant's gaze is directed at focal column or not
  - Likelihood of fixating on a column in each time bin is calculated by averaging across participants
  - Likelihood curves of fixating on each column for first 5 seconds and final five seconds were plotted.
- Results:
  - Likelihood of fixating on central brand higher in the first 5 seconds (initial central fixation bias)
  - Support for central gaze cascade effect: participants were more likely to fixate on the centrally located brand (compared to the brands on the left or right) in the final few seconds of the gaze duration
- What drives choice?
  - Procedure: Horizontal location of the chosen brand regressed against proportion of fixations on the centrally located brand
  - Results: Support for central gaze cascade effect

# Results and Interpretation

- Horizontal centrality predicts visual attention and choice.
  - Horizontal centrality did not predict brand inferences or memory-based attention measures.
  - Effect held even when product category was not in center of shelf display or visual field.
- Driven by central gaze cascade effect, not initial tendency to fixate in center or only the general gaze cascade effect on chosen option.

# Ruled-Out Alternative Explanations

- Feedback Loop: Initial fixation on center can lead to feedback loop that leads to amplified gaze cascade effect in final stages.
  - Ruled out: Fixation densities on central brand in first five seconds not related to fixation densities on central brand in last five seconds.
- “Value Construction” Perspective: Initial leader is chosen and gets primacy advantage and serves as comparison for other options.
  - Ruled out: Chosen alternative was not the one that was evaluated most favorably.
- Lay Beliefs: “I believe most popular products are placed always in the middle.”
  - Ruled out: Ratings on above measures not related to fixation densities.